

Table S1. Anoxia tolerance of species from the 11 phyla in Fig. 1

Phylum	Species	Anoxic survival time (hr)	Temperature (°C)	Reference
Annelida	<i>Arenicola marina</i>	398	10	Groenendaal, 1980
Annelida	<i>Capitella capitata</i>	168	15	Warren, 1977
Annelida	<i>Cirriformia tentaculata</i>	240	12	Bestwick et al., 1989
Annelida	<i>Hirudo medicinalis</i>	108	20	Schmidt and Zerbst-Boroffka, 1993
Annelida	<i>Loimia medusa</i>	79	26	Llanso and Diaz, 1994
Annelida	<i>Lumbricus rubellus</i>	24	15	Gruner and Zebe 1978
Annelida	<i>Lumbricus terrestris</i>	24	15	Gruner and Zebe 1979
Annelida	<i>Lumbricus variegatus</i>	168	20	Putzer at al., 1990; Gnaiger and Staudigl 1987; Puizer, 1985
Annelida	<i>Nereis diversicolor</i>	120	10	Theede et al., 1969
Annelida	<i>Owenia fusiformis</i>	168	15	Warren and Dales, 1980
Annelida	<i>Scoloplos armiger</i>	45	12	Schottler and Grieshaber, 1988
Annelida	<i>Streblospio benedicti</i>	43	26	Llanso, 991
Annelida	<i>Tubifex tubifex</i>	7104	15	Famme and Knudsen 1985
Arthropoda	<i>Aedes aegypti</i>	2	22	Knipling er al. 1961
Arthropoda	<i>Alaskozetes antarcticus</i>	672	0	Block and Somme 1982
Arthropoda	<i>Amara alpina</i>	1224	0	Somme 1974
Arthropoda	<i>Amblycheila cylindriformis</i>	48	25	Hoback et al., 2000

Arthropoda	<i>Anurophorus laricis</i>	2160	0	Leinaas and Somme 1984
Arthropoda	<i>Bledius spectabilis</i>	36	19	Wyatt 1986
Arthropoda	<i>Bombyx mori</i> eggs	2400	7.5	Kidokoro and Ando, 2006; Ando 1978
Arthropoda	<i>Byrrhus pilula</i>	2880	0	Somme 1974
Arthropoda	<i>Callianassa californiensis</i>	55	10	Zebe, 1982
Arthropoda	<i>Callianassa jamaicense</i>	79	25	Felder, 1979
Arthropoda	<i>Calocaris macandreae</i>	43	10	Anderson et al., 1994
Arthropoda	<i>Calyptozetes sarekensis</i>	2301	0	Somme and Conrai-Larsen 1977
Arthropoda	<i>Camisia anomia</i>	864	5	Hodkinson and Bird 2004
Arthropoda	<i>Carabodes labyrinthicus</i>	2304	0	Somme and Conrai-Larsen 1977
Arthropoda	<i>Carcinus maenas</i>	17	10	Hill et a., 1991; Theede et al., 1969
Arthropoda	<i>Ceratophysella longispina</i>	168	5	Hodkinson and Bird 2004
Arthropoda	<i>Chaoborus crystallinus</i>	24	14	Englische et al. 1982; Scholz and Zerbst-Boroffka 1998
Arthropoda	<i>Chironomus anthracinus</i>	2400	4	Nagell and Landahl, 1978
Arthropoda	<i>Chironomus plumosus</i> larvae	4920	4	Nagell and Landahl, 1978
Arthropoda	<i>Chironomus thummi</i>	14	20	Redecker and Zebe 1988; Wilps and Zebe 1976
Arthropoda	<i>Cicindela hirticollis</i>	79	16.5	Brust et al., 2005
Arthropoda	<i>Cicindela togata</i>	144	25	Hoback et al. 1998,

	(larval stage)			2000
Arthropoda	<i>Cicindela togata</i>	120	5	Hoback et al., 2000
Arthropoda	<i>Corophium arenarium</i>	21	10	Gamble, 1970
Arthropoda	<i>Crangon crangon</i>	2	10	Theede et al., 1969
Arthropoda	<i>Crophium volutator</i>	29	10	Gamble, 1970
Arthropoda	<i>Cryptopygus antarcticus</i>	672	0	Somme and Blook 1982
Arthropoda	<i>Culex pipiens</i> (larval stge)	16	12	Redecker and Zebe 1988
Arthropoda	<i>Diapterobates notatus</i>	336	5	Hodkinson and Bird 2004
Arthropoda	<i>Drosophila melanogaster</i>	4	20	Krishnan et al., 1997
Arthropoda	<i>Epiblema scudderiana</i>	24	14	Joanisse and story 1998
Arthropoda	<i>Epilachna varivestis</i>	24	22	Knipling er al. 1961
Arthropoda	<i>Eurosta Solidaginis</i>	24	14	Joanisse and story 1998
Arthropoda	<i>Eurypanopeus depressus</i>	24	20	Stickle et al., 1989
Arthropoda	<i>Folsomia quadrioculata</i>	336	5	Hodkinson and Bird 2004
Arthropoda	<i>Fuscozetes intermedius</i>	2160	0	Somme 1979
Arthropoda	<i>Gamasellus racovitzai</i>	192	0	Block and somme 1982
Arthropoda	<i>Gammarus duebeni</i>	7	20	Agnew and Jones, 1986
Arthropoda	<i>Gammarus oceanicus</i>	14	10	Theede et al., 1969
Arthropoda	<i>Gasterophilus intestinalis</i>	600	37	Levenbook 1950
Arthropoda	<i>Halozetes marinus</i>	786	0	Somme and Block

				1984
Arthropoda	<i>Hyadesia maxima</i>	384	0	Somme and Block 1984
Arthropoda	<i>Hyalophora cecropia</i>	48	25	Wilhelm et al. 1961
Arthropoda	<i>Hydromedion spartsutum</i>	48	0	Block and Somme 1983
Arthropoda	<i>Hypogastrura tullbergi</i>	336	5	Hodkinson and Bird 2004
Arthropoda	<i>Hypogastrura viatica</i>	864	5	Hodkinson and Bird 2004
Arthropoda	<i>Idotea baltica</i>	7	10	Theede et al., 1969
Arthropoda	<i>Isotoma anglicana</i>	24	5	Hodkinson and Bird 2004
Arthropoda	<i>Isotoma tschernovi</i>	24	5	Hodkinson and Bird 2004
Arthropoda	<i>Isotoma violacea</i>	216	0	Somme and Conrai-Larsen 1977
Arthropoda	<i>Lepyrus arcticus</i>	1392	0	Somme 1974
Arthropoda	<i>Locusta migratoria</i>	3	20.3	Wegner and Moratzky 1995
Arthropoda	<i>Locusta migratoria</i>	6	25	Wu et al., 2002
Arthropoda	<i>Leucophaea maderae</i>	16	22	Knipling er al. 1961
Arthropoda	<i>Macrobrachium nipponense</i>	38	20	Kang and Matsuda, 1993
Arthropoda	<i>Manduca sexta</i>	24	20.3	Wegner and Moratzky 1995
Arthropoda	<i>Melanoplus femur-rubrum</i>	24	22	Knipling er al. 1961
Arthropoda	<i>Melasoma collaris</i>	2880	0	Meidell 1983
Arthropoda	<i>Metapenaeus monoceros</i>	21	22	Kang and Matsuda, 1993
Arthropoda	<i>Musca domestica</i>	0.5	0	Heslop et al 1963

Arthropoda	<i>Musca domestica</i>	4	22	Knipling et al. 1961
Arthropoda	<i>Ocyphus olens</i> (eggs)	96	20	Lincoln 1961
Arthropoda	<i>Onychiurus arcticus</i>	336	5	Hodkinson and Bird 2004
Arthropoda	<i>Onychiurus groenlandicus</i>	336	5	Hodkinson and Bird 2004
Arthropoda	<i>Onychiurus vontoernei</i>	480	0	Somme 1979
Arthropoda	<i>Oopterus soledadinus</i>	96	0	Block and Somme 1983
Arthropoda	<i>Otiorhynchus dubius</i>	2880	0	Somme 1974
Arthropoda	<i>Palaemon serratus</i>	2	10	Talor and Spices, 1987
Arthropoda	<i>Palaemonetes pugio</i>	24	30	Stickle et al., 1989
Arthropoda	<i>Parisotoma octoculata</i>	96	0	Somme and Blook 1982
Arthropoda	<i>Pelophila borealis</i>	3744	0	Contadi-Larsen and Somme 1973; Somme 1974
Arthropoda	<i>Pemphigus treherne</i>	40	20	Foster and Treherne, 1976
Arthropoda	<i>Perimylops antarcticus</i>	48	0	Block and Somme 1983
Arthropoda	<i>Phaeoxantha klugii</i>	137	29	Zerm and Adis 2003
Arthropoda	<i>Popillia japonica</i>	96	22	Knipling et al. 1961
Arthropoda	<i>Portunus trituberculatus</i>	29	22	Kang and Matsuda, 1993
Arthropoda	<i>Samia cynthia</i>	48	25	Wilhelm et al. 1961
Arthropoda	<i>Sarcophaga bullata</i>	4	25	Yoder et al., 2006
Arthropoda	<i>Sarcophaga crassipalpis</i>	96	25	Kukal et al., 1991; Yocom and Denlinger 1994
Arthropoda	<i>Schistocerca gregaria</i>	8	23	Hochachka et al

Arthropoda	<i>Sminthurides malmgreni</i>	24	5	1993; Wegner 1993 Hodkinson and Bird 2004
Arthropoda	<i>Tanais chevreux</i>	50	15	Gamble, 1970
Arthropoda	<i>Tetracanthella afurcata</i>	2160	0	Somme 1979
Arthropoda	<i>Tetracanthella arctica</i>	336	5	Hodkinson and Bird 2004
Arthropoda	<i>Tetracanthella wahlgreni</i>	2304	0	Somme and Conrai-Larsen 1977
Arthropoda	<i>Tribolium confusum</i>	72	22	Knipling et al. 1961
Arthropoda	<i>Upogebia africana</i>	19	18	Hill, 1981
Arthropoda	<i>Upogebia pugettensis</i>	29	10	Zebe, 1982
Arthropoda	<i>Xenylla maritima</i>	2160	0	Leinaas and Somme 1984
Chordata	<i>Apalone spinifera</i>	336	3	Reese et al., 2003
Chordata	<i>Astronotus crassipinnis</i>	3	29	Chippari-Gomeset al., 2005
Chordata	<i>Astronotus ocellatus</i>	6	28	Almeida-Val et al., 2000
Chordata	<i>Austrofundulus limnaeus (diapause)</i>	1448	25	Fergusson-kolmes and Podrabsky 2007
Chordata	<i>Carassius auratus</i>	65	10	Thillart et al., 1993
Chordata	<i>Carassius carassius</i>	3000	2	Piironen and Holopainen, 1986
Chordata	<i>Carassius carassius</i>	6	15	Johnston and Bernard, 1983
Chordata	<i>Chelydra serpentina</i>	2400	3	Reese et al., 2003, Ultsch 2006
Chordata	<i>Chrysemys picta bellii</i>	4380	3	Jackson and Ultsch, 1982; Ultsch and Jackson, 1982; Herbert and

				Jackson, 1985
Chordata	<i>Cyprinus carpio</i>	6	15	Johnston and Bernard, 1983
Chordata	<i>Cyprinus carpio</i>	2	18	Nilsson 2001
Chordata	<i>Cyprinus carpio</i>	1.5	20	Van Raaij et al 1994
Chordata	<i>Eptatretus stoutii</i>	48	10	Cox et al., 2010, 2011
Chordata	<i>Graptemys geographica</i>	1080	3	Reese et al., 2001/ Ultsch 2006
Chordata	<i>Hemiscyllium ocellatum</i>	0.77	28	Renshaw et al., 2002
Chordata	<i>Heterocephalus glaber</i>	0.3	30	Park et al., 2017
Chordata	<i>Rana catesbeiana</i>	72	3	Stewart et al., 2003
Chordata	<i>Rana pipiens</i>	30	5	Hermes-Lima and Storey 1996
Chordata	<i>Rana sylvatica</i>	24	5	Gerber et al., 2016
Chordata	<i>Rana temporaria</i>	3	20	wegener and Krouse 1993
Chordata	<i>Sternotherus odoratus</i>	600	3	Ultsch 2006
Chordata	<i>Thamnophis sirtalis parietalis</i>	10	5	Hermes-Lima and Storey 1993
Chordata	<i>Trachemys scripta</i>	1056	3	Ultsch 1985/Warren et al. 2006
Chordata	<i>Typhlogobius californiensis</i>	90	15	Congleton 1974
Cnidaria	<i>Aequorea victoria</i>	14	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Aurelia labiata</i>	14.5	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Clytia gregaria</i>	9	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Cyanea capillata</i>	1.5	10	Rutherford and

				Thuesen, 2005
Cnidaria	<i>Euphyxa flammea</i>	10	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Eutonina indicans</i>	10	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Halitholus sp</i>	11	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Muggiaeaa atlantica</i>	1	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Phacellophora camtschatica</i>	13	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Polyorchis penicillatus</i>	17	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Proboscidactyla flavidicirrata</i>	2.5	10	Rutherford and Thuesen, 2005
Cnidaria	<i>Sarsia sp.</i>	5	10	Rutherford and Thuesen, 2005
Coelenterata	<i>Astrangia danae</i>	144	22	Sassaman and Mangum 1973
Coelenterata	<i>Bunodosoma cavernata</i>	1008	22	Mangum 1980
Coelenterata	<i>Diadumene leucolena</i>	24	22	Sassaman and Mangum 1973
Coelenterata	<i>Haliplanella luciae</i>	168	22	Sassaman and Mangum 1973
Coelenterata	<i>Haloclava producta</i>	264	22	Sassaman and Mangum 1973
Coelenterata	<i>Metridium senile</i>	120	22	Sassaman and Mangum 1973
Echinodermata	<i>Amphiura filiformis</i>	180	7	Vistisen and Vismann 1997
Echinodermata	<i>Asterias rinems</i>	84	10	Theede et al., 1969
Echinodermata	<i>Cucumaria miniata</i>	6	12	Weinrauch and Blewett 2019

Echinodermata	<i>Ophiura albida</i>	31	10	Theede et al., 1969; Vistisen and Vismann, 1998
Echinodermata	<i>Parastichopus californicus</i>	6	12	Weinrauch and Blewett 2019
Mollusca	<i>Aplexa nilens</i>	6	30	von Brand et al., 1950
Mollusca	<i>Arctica islandica</i>	1320	10	Theede et al., 1969; Oeschger 1990
Mollusca	<i>Astarte borealis</i>	1440	10	Oeschger 1990
Mollusca	<i>Australorbis glabratus</i>	24	30	von Brand et al., 1950
Mollusca	<i>Austrovenus stutchburyi</i>	168	20	Carroll and Wells 1995
Mollusca	<i>Biomphalaria boissyi</i>	24	30	von Brand et al., 1950
Mollusca	<i>Biomphalaria pfeifferi</i>	24	30	von Brand et al., 1950
Mollusca	<i>Cardium edule</i>	103	10	Theede et al., 1969; Widdows, 1987
Mollusca	<i>Cepaea nemoralis</i>	18	21	van der Horst 1974
Mollusca	<i>Cerastoderma edule</i>	69	18	Zwann et al., 2002
Mollusca	<i>Chamelea gallina</i>	57	18	Zwann et al., 2002
Mollusca	<i>Crassostrea virginica</i>	672	10	Stickle et al., 1989
Mollusca	<i>Crassostrea virginica</i>	151	22	Widdows et al., 1989
Mollusca	<i>Goniobasis livescens</i>	24	30	von Brand et al., 1950
Mollusca	<i>Helisoma duryi</i>	24	30	von Brand et al., 1950
Mollusca	<i>Helisoma trivolvis</i>	64	30	von Brand et al., 1950
Mollusca	<i>Littorina littorea</i>	288	10	Theede et al., 1969

Mollusca	<i>Littorina saxatilis</i>	144	10	Theede et al., 1969
Mollusca	<i>Lymnaea natalensis</i>	6	30	von Brand et al., 1950
Mollusca	<i>Lymnaea palustris</i>	6	30	von Brand et al., 1950
Mollusca	<i>Lymnaea stagnalis</i>	16	30	von Brand et al., 1950
Mollusca	<i>Macoma balthica</i>	115	19	de Zwaan 2001
Mollusca	<i>Mactra discors</i>	35	20	Carroll and Wells 1995
Mollusca	<i>Melanoides tuberculatus</i>	64	30	von Brand et al., 1950
Mollusca	<i>Modiolus demissus</i>	120	10	Hammen 1976; Pamatmat 1979
Mollusca	<i>Mulina lateralis</i>	264	10	Shumway et al., 1983
Mollusca	<i>Mya arenaria</i>	240	10	Theede et al., 1969
Mollusca	<i>Mytilus edulis</i>	840	10	Zwann Ertman 1996; de Zwaan and Wijsman 1976; Wang and Windows 1993; Oescheger 1990; Theede et al., 1969
Mollusca	<i>Mytilus galloprovincialis</i>	360	20	de zwanne et al 1991
Mollusca	<i>Nassarius obsoletus</i>	216	22	Kushins and Mangum 1971
Mollusca	<i>Nassarius trivittatus</i>	216	22	Kushins and Mangum 1971
Mollusca	<i>Oncoc Melania nosophora</i>	48	30	von Brand et al., 1950
Mollusca	<i>Paphies australis</i>	168	20	Carroll and Wells 1995

Mollusca	<i>Paphies subtrangulatum</i>	48	20	Carroll and Wells 1995
Mollusca	<i>Physa cubensis</i>	6	30	von Brand et al., 1950
Mollusca	<i>Physa gyrina</i>	16	30	von Brand et al., 1950
Mollusca	<i>Planorbarius corneus</i>	64	30	von Brand et al., 1950
Mollusca	<i>Pomaliopsis lapidaria</i>	48	30	von Brand et al., 1950
Mollusca	<i>Scapharca inaequivalvis</i>	408	18	Brooks et al 1991; de Zwanne et al 1991; de Zwaan et al., 1993
Mollusca	<i>Scrobicularia plana</i>	552	10	Theede et al., 1969
Mollusca	<i>Stramonita haemastoma</i>	480	10	Stickle et al., 1989
Mollusca	<i>Tropicorbis donbilli</i>	24	30	von Brand et al., 1950
Mollusca	<i>Tropicorbis obstructus</i>	64	30	von Brand et al., 1950
Mollusca	<i>Venus gallina</i>	96	18	Brooks et al 1991
Nematoda	<i>Metachromadora vivipara</i>	336	16	Steyaert et al. 2007
Nematoda	<i>Nannolaimoides decoratus</i>	10	38	Wieser et al., 1974
Nematoda	<i>Paramonhyster sp</i>	10	36	Wieser et al., 1974
Nematoda	<i>Sabatieria pulchra</i>	336	16	Steyaert et al. 2007
Nematoda	<i>Terschellingia communis</i>	336	16	Steyaert et al. 2007
Nematoda	<i>Theristus erectus</i>	10	34	Wieser et al., 1974
Platyhelminthes	<i>Macrostomum lignano</i>	1.5	20	Rivera-Ingraham and Bickmeyer 2013

Priapulida	<i>Halicryptus spinulosus</i>	960	10	Oeschger 1990
Sipuncula	<i>Dendrostomum sp</i>	79	10	Hammen, 1976
Sipuncula	<i>Sipunculus nudus</i>	48	20	von Brand 1946; Hardewig et al., 1991

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