

Zeigertierart	Stoff	LC50	LOEL	Effekt	Quelle	Autor/ Jahr	Sonstiges
Adenophlebia auriculata (Insecta, Ephemeroptera)	Cu 2+, acut	24h: 1,78 mg/L 48h: 0,79 mg/L 96h: 0,18 mg/L	0,277 mg/L 0,231 mg/L	increased ventilation, movement	Copper tolerances of <i>Adenophlebia auriculata</i> (Eaton) 1884 (Insecta: Ephemeroptera) and <i>Burnupia stenochoris</i> Cawston 1932 (Gastropoda: Ancylidae) in indoor artificial streams / <i>The Science of the Total Environment</i> 215 (1998) 217-229	Gerhardt A./ 1998	
<i>Asellus aquaticus</i> (Malacostraca, Isopoda)	activated carbon (AC), acut			no effect could be shown with the MFB	Ecotoxicological Effects of Activated Carbon Amendments on Macroinvertebrates in Nonpolluted and Polluted Sediments/ <i>Environmental Science & Technology</i>	Kupryianchik D./ 2011	
<i>Atyaephyra desmaresti</i> (Crustacea, Decapoda)	AMD (acid mine drainage), acut	48h: pH-AMD= 5,8	5h exposition	decreased movement	Macroinvertebrate response to acid mine drainage: community metrics and on-line behavioural toxicity bioassay/ <i>Environmental Pollution</i> 130 (2004) 263-274	Gerhardt A./ 2003	
<i>Atyaephyra desmaresti</i> (Crustacea, Decapoda)	AMD (acid mine drainage), acut	24h: pH-AMD=4, 48h: pH-AMD=5,2	pH-AMD≤6,4	decreased activity and loss of the circadic rhythm, pH=4 increased ventilation	Behavioral Changes and Acute Toxicity to the Freshwater Shrimp <i>Atyaephyra desmaresti</i> Millet (Decapoda: Natantia) from Exposure to Acid Mine Drainage/ <i>Ecotoxicology</i> , 15, 215-227, 2006	Janssens de Bisthoven L./ 2006	
<i>Caenorhabditis elegans</i> (Nematoda, Rhabditida)					Measurement of movement patterns of <i>Caenorhabditis elegans</i> (Nematoda) with the Multispecies Freshwater Biomonitor (MFB)—a potential new method to study a behavioral toxicity parameter of nematodes in sediments/ <i>Environmental Pollution</i> 120 (2002) 513-516	Gerhardt A./ 2002	it shows that Nematodes can be used for the MFB
<i>Carcinus maenas</i> (Crustacea, Decapoda)	Ammonium, acut	96 h: 6,88 mg/L	2,3 mg/L	changes in the movement	Assessment of the Multispecies Freshwater Biomonitor (MFB) in a marine context: the Green crab (<i>Carcinus maenas</i>) as an early warning indicator/ <i>Journal of Environmental Monitoring</i> b925474a	Stewart S.C./ 2009	tested: inactivity, walk, climb
Chironomidae Larve (Insecta, Diptera)	AMD (acid mine drainage)		pH-AMD=3,4	stressbehavior	Chironomidae larvae as bioindicators of an acid mine drainage in Portugal/ <i>Hydrobiologia</i> (2005) 532: 181-191	Janssens de Bisthoven L./ 2004	
<i>Chironomus gr. Thummi</i> larven (Insecta, Diptera)	river monitoring				Behavioural, developmental and morphological responses of <i>Chironomus gr. thummi</i> larvae (Diptera, Nematocera) to aquatic pollution/ <i>Journal of Aquatic Ecosystem Health</i> 4: 205-214, 1995	Gerhardt A./ 1995	different behavior patterns in rivers with different pollution degrees
<i>Chironomus</i> Larve (Insecta, Diptera)	AMD (acid mine drainage), acut		pH= 4,4-5,5	decreased activity	Effects of acid mine drainage on larval chironomus (Diptera, Chironomidae) measured with the multispecies freshwater biomonitor/ <i>Environmental Toxicology and Chemistry</i> , Vol. 23, No.5, pp 1123-1128, 2004	Janssens de Bisthoven L./ 2003	
<i>Chironomus riparius</i> (Insecta, Diptera)	Thiacloprid, chronic	17 d: 1,57 µg/L	1 µg/L (17d) 5 µg/L	decreased activity, increased ventilation	Assessing Toxicity of the Insecticide Thiacloprid on <i>Chironomus riparius</i> (Insecta: Diptera) Using Multiple End Points/ <i>Arch. Environ. Contam. Toxicol.</i> DOI 10.1007/s00244-009-9420-x	Langer-Jaerich M./ 2009	
<i>Chironomus riparius</i> (Insecta, Diptera)	PCDD/F, PCB and Hg polluted river sediments Konzentration: PCDD/Fs: 19.33 nmol g ⁻¹ dw Hg: 1.2 µg g ⁻¹ dw, chronic			no effect could be shown with the MFB	Biological responses of midge (<i>Chironomus riparius</i>) and lamprey (<i>Lampetra fluviatilis</i>) larvae in ecotoxicity assessment of PCDD/F-, PCB- and Hg-contaminated river sediments/ <i>Environmental Science and Pollution Research</i>	Salmelin J./ 2016	no ecotoxicological influence of PCDD/F, PCB & Hg polluted sediments on <i>Chironomus riparius</i> and <i>Lampetra fluviatilis</i> at the measured concentrations.
<i>Chironomus riparius</i> (Insecta, Diptera)	Imidacloprid, acut		0,1 µg/L	decreased locomotion, uncoordinated movements	Die akute Toxizität zweier Insektizide und eines Schwermetalls auf das Überleben und das Verhalten der Zuckmückenlarve <i>Chironomus riparius</i> - Einzel und Kombinationswirkungen/ Diplomarbeit	Keller B./ 2008	
<i>Chironomus riparius</i> (Insecta, Diptera)	Thiacloprid, acut		1 µg/L	decreased locomotion, uncoordinated movements	Die akute Toxizität zweier Insektizide und eines Schwermetalls auf das Überleben und das Verhalten der Zuckmückenlarve <i>Chironomus riparius</i> - Einzel und Kombinationswirkungen/ Diplomarbeit	Keller B./ 2008	
<i>Chironomus riparius</i> (Insecta, Diptera)	Cadmium		5 mg/L	inactivity	Die akute Toxizität zweier Insektizide und eines Schwermetalls auf das Überleben und das Verhalten der Zuckmückenlarve <i>Chironomus riparius</i> - Einzel und Kombinationswirkungen/ Diplomarbeit	Keller B./ 2008	
<i>Chironomus riparius</i> (Insecta, Diptera)	Chlorpyrifos (CHP), acut		6 µg/L	stay in the sediment	Impairment of trophic interactions between zebrafish (<i>Danio rerio</i>) and midge larvae (<i>Chironomus riparius</i>) by chlorpyrifos/ <i>Ecotoxicology</i> , July, 1294-1301.	Langer-Jaerich M./ 2010	
<i>Choroterpes pictetii</i> (Insecta, Ephemeroptera)	AMD (acid mine drainage), acut	48h: pH-AMD= 4,8-4,9	< pH-AMD=7,4	increased movement, then decreased activity	Behavioural responses of indigenous benthic invertebrates (<i>Echinogammarus meridionalis</i> , <i>Hydropsyche pellucidula</i> and <i>Choroterpes pictetii</i>) to a pulse of Acid Mine Drainage: A laboratorial study/ <i>Ecotoxicology</i> , 15, 215-227, 2006	Macedo-Sousa J.A./ 2008	
<i>Choroterpes pictetii</i> (Insecta, Ephemeroptera)	AMD (acid mine drainage), acut	48h: pH-AMD=4,8-4,9	pH= 4,4	decreased activity	Effects of Acid Mine Drainage and Acidity on the Activity of <i>Choroterpes pictetii</i> (Ephemeroptera: Leptophlebiidae)/ <i>Arch. Environ. Contam. Toxicol.</i> 48, 450-458 (2005), DOI: 10.1007/s00244-003-0222-2	Gerhardt A./ 2004	
<i>Corophium volutator</i> (Crustacea, Amphipoda)	Bioban (Pestizid), acut		≥56 mg/kg, 121 mg/kg	increased movement, increased ventilation	Use of the multispecies freshwater biomonitor to assess behavioral changes of <i>Corophium volutator</i> (Pallas, 1766) (Crustacea, Amphipoda) in response to toxicant exposure in sediment/ <i>Ecotoxicology and Environmental Safety</i> 64 (2006) 298-303	Kirkpatrick A.J./ 2005	
<i>Corophium volutator</i> (Crustacea, Amphipoda)	water accommodated fraction (WAF) of weathered Forties crude oil, acut		25% WAF	hyperactivity, increased ventilation	Behavior of <i>Corophium volutator</i> (Crustacea, Amphipoda) exposed to the water-accommodated fraction of oil in water and sediment / <i>Environmental Toxicology and Chemistry</i> , Vol. 27, No. 3, pp. 599-604, 2008	Kienle C. / 2007	

Zeigertierart	Stoff	LC50	LOEL	Effekt	Quelle	Autor/ Jahr	Sonstiges
Crangon Crangon (Crustacea, Decapoda)	pH-stress, acut		<pH=7 in 0,2 pH Schritten	to every decrease of the pH-value follows a short increase of the activity	Behavioural Responses of Crangon crangon (Crustacea, Decapoda) to Reduced Seawater pH Following Simulated Leakage from Sub-Sea Geological Storage/ Journal of Environmental Protection, 2013, 4, 61-67	Gerhardt A./ 2013	C. crangon is a highly sensitive Biosensor for pH- changes
Crangonyx pseudogracilis (Crustacea, Amphipoda)	Ammoniumchlorid (NH4Cl)		Gradient 0-1,4 mg/L & 1,4-14 mg/L	decreased activity	Suitability of Crangonyx pseudogracilis (Crustacea: Amphipoda) as an Early Warning Indicator in the Multispecies Freshwater Biomonitor/ Environ. Sci. Pollut. Res. 13 (4) 242-250 (2006)	Kirkpatrick A.J./ 2006	
Danio rerio (Pisces, Cypriniformes)	NiCl2		≥7,5 mg/L	decreased movement	Behavioural and developmental toxicity of chlorpyrifos and nickel chloride to zebrafish (Danio rerio) embryos and larvae/ Ecotoxicology and Environmental Safety 72 (2009) 1740-1747	Kienle C. / 2009	
Danio rerio (Pisces, Cypriniformes)	Chlorpyrifos (CHP), acut		≥0,25 mg/L	increased movement	Behavioural and developmental toxicity of chlorpyrifos and nickel chloride to zebrafish (Danio rerio) embryos and larvae/ Ecotoxicology and Environmental Safety 72 (2009) 1740-1747	Kienle C. / 2009	
Danio rerio (Pisces, Cypriniformes)	Chlorpyrifos (CHP), chronic	10d: 0,43 mg/L	≥0,01 mg/L	change in the behavior	Behavioural and developmental toxicity of chlorpyrifos and nickel chloride to zebrafish (Danio rerio) embryos and larvae/ Ecotoxicology and Environmental Safety 72 (2009) 1740-1747	Kienle C. / 2009	
Danio rerio (Pisces, Cypriniformes)	Nickel, acut	LC20= 9,5 mg/L (11 d old)	7,5 mg/L	decreased movement	Effects of nickel chloride and oxygen depletion on behaviour and vitality of zebrafish (Danio rerio, Hamilton, 1822) (Pisces, Cypriniformes) embryos and larvae/ Environmental Pollution 152 (2008) 612-620	Kienle C./ 2007	
Danio rerio (Pisces, Cypriniformes)	3,4-dichloroaniline (3,4-DCA), subchronic	11d: 0,388 mg/L	≥0,25 mg/L ≥0,5 mg/L	deformation influence on the movement (5d) and mortality (10d)	Effects of 3,4-dichloroaniline and diazinon on different biological organisation levels of zebrafish (Danio rerio) embryos and larvae/ Ecotoxicology (2009) 18:355-363	Scheil V./ 2008	
Danio rerio (Pisces, Cypriniformes)	Diazinon, subchronic		1 mg/L ≥2 mg/L	deformation influence on the movement (5d) and mortality (10d)	Effects of 3,4-dichloroaniline and diazinon on different biological organisation levels of zebrafish (Danio rerio) embryos and larvae/ Ecotoxicology (2009) 18:355-364	Scheil V./ 2008	
Danio rerio (Pisces, Cypriniformes) (120h alt)	Imidacloprid, acut		2h Exposition: bis 50 mg/L	no significant effect	Kombinationswirkungen von Stressoren auf Verhalten und Vitalität von juvenilen Danio rerio: Imidacloprid, Thiachloprid, Sauerstoffdefizit/ Diplomarbeit	Langer M./ 2009	
Danio rerio (Pisces, Cypriniformes) (120h alt)	Thiachloprid, acut		2h exposition: 1 mg/L	decreased swimactivity	Kombinationswirkungen von Stressoren auf Verhalten und Vitalität von juvenilen Danio rerio: Imidacloprid, Thiachloprid, Sauerstoffdefizit/ Diplomarbeit	Langer M./ 2009	
Danio rerio (Pisces, Cypriniformes) (120h alt)	Oxygendefizit, acut		37%	decreased activity	Kombinationswirkungen von Stressoren auf Verhalten und Vitalität von juvenilen Danio rerio: Imidacloprid, Thiachloprid, Sauerstoffdefizit/ Diplomarbeit	Langer M./ 2009	
Danio rerio (Pisces, Cypriniformes) (120h alt)	Imidacloprid, subchronic		264h exposition: 1 mg/L	decreased swimactivity	Kombinationswirkungen von Stressoren auf Verhalten und Vitalität von juvenilen Danio rerio: Imidacloprid, Thiachloprid, Sauerstoffdefizit/ Diplomarbeit	Langer M./ 2009	
Danio rerio (Pisces, Cypriniformes) (5d)	Ni, acut		>7,5 mg/L	decreased activity	Wirkung von unterschiedlichen Schadstoffen und Schadstoffkombinationen auf das Verhalten und die Vitalität von frühen Lebensstadien des Zebrafischlings (Danio rerio) mit und ohne zusätzlichen Umweltstress/ Diplomarbeit	Kienle C./ 2005	
Danio rerio (Pisces, Cypriniformes) (5d)	Chlorpyrifos (CHP), acut		>750 mg/L	increased activity	Wirkung von unterschiedlichen Schadstoffen und Schadstoffkombinationen auf das Verhalten und die Vitalität von frühen Lebensstadien des Zebrafischlings (Danio rerio) mit und ohne zusätzlichen Umweltstress/ Diplomarbeit	Kienle C./ 2005	
Daphnia magna (Crustacea, Branchiopoda)	dipterex (OP= organophosphorous), acut	24h: 0,45 µg/L 48h: 0,21 µg/L		increased behavior answer, shorter reactiontime	The early warning of aquatic organophosphorus pesticide contamination by on-line monitoring behavioral changes of Daphnia magna/ Environ. Monit. Assess. (2007) 134:373-383	Ren Z./ 2007	
Daphnia magna (Crustacea, Branchiopoda)	malathion (OP), acut	24h: 3,80 µg/L 48h: 0,90 µg/L		increased behavior answer, shorter reactiontime	The early warning of aquatic organophosphorus pesticide contamination by on-line monitoring behavioral changes of Daphnia magna/ Environ. Monit. Assess. (2007) 134:373-384	Ren Z./ 2007	
Daphnia magna (Crustacea, Branchiopoda)	parathion (OP), acut	24h: 1,25 µg/L 48h: 0,38 µg/L		increased behavior answer, shorter reactiontime	The early warning of aquatic organophosphorus pesticide contamination by on-line monitoring behavioral changes of Daphnia magna/ Environ. Monit. Assess. (2007) 134:373-385	Ren Z./ 2007	
Daphnia magna (Crustacea, Branchiopoda)	pH-Value, chronic		< pH= 6,9	change in the behavior according to Stressmodel	Quality control of drinking water from the River Rhine with the Multispecies Freshwater Biomonitor/ Aquatic Ecosystem Health & Management, DOI: 10.1080/14634980301466	Gerhardt A./ 2003	
Daphnia magna (Crustacea, Branchiopoda)	AMD (acid mine drainage), acut	48h: pH-AMD= 5,9	pH≤ 7	6 h exposition: decreased movement and ventilation, 6-12h Exposition: increased ventilation	Evidence for the Stepwise Stress Model: Gambusia holbrooki and Daphnia magna under Acid Mine Drainage and Acidified Reference Water Stress/ Environ. Sci. Technol. 2005, 39, 4150-4158	Gerhardt A./ 2005	
Daphnia magna (Crustacea, Branchiopoda)	light		light stress	negativ phototaxis	Automated recording of vertical negative phototactic behaviour in Daphnia magna Straus (Crustacea)/ Hydrobiologia (2006) 559:433-441	Gerhardt A./ 2005	
Daphnia magna (Crustacea, Branchiopoda)	acetic acid, acut		pH=5,5	90 min exposition: decreased activity	Entwicklung neuer Einsatzmöglichkeiten des Multispecies Freshwater Biomonitor: Messeinheit für Meiofauna und Anwendung in der Bodentoxikologie/ Diplomsemesterbericht	Schmidt S./ 2002	
Dendrobaena veneta (Clitellata, Haplotaxida)	acetic acid, acut		pH=4	8-12 h exposition: decreased activity	Entwicklung neuer Einsatzmöglichkeiten des Multispecies Freshwater Biomonitor: Messeinheit für Meiofauna und Anwendung in der Bodentoxikologie/ Diplomsemesterbericht	Schmidt S./ 2002	

Zeigertierart	Stoff	LC50	LOEL	Effekt	Quelle	Autor/ Jahr	Sonstiges
Echinogammarus meridionalis (Crustacea, Malacostraca)	AMD (acid mine drainage), acut		pH-AMD=6,5	decreased movement, feeding	Behavioural and feeding responses of Echinogammarus meridionalis (Crustacea, Amphipoda) to acid mine drainage/ Chemosphere 67 (2007) 1663-1670	Macedo-Sousa J.A./ 2006	
Echinogammarus meridionalis (Crustacea, Malacostraca)	AMD (acid mine drainage), acut		< pH-AMD=7,4	increased movement, following a abrupt decreasing in movement and ventilation	Behavioural responses of indigenous benthic invertebrates (Echinogammarus meridionalis, Hydropsyche pellucidula and Choroterpes picteti) to a pulse of Acid Mine Drainage: A laboratorial study/ Environmental Pollution 155 (2008) 966-973	Macedo-Sousa J.A./ 2008	
Eisenia fetida (Clitellata, Oligochaeta)	WWTP, acut		2d Exposition: 0,2 g	avoidance of the contaminated sediment	Toxic potential of different types of sewage sludge as fertiliser in agriculture: ecotoxicological effects on aquatic, sediment and soil indicator species/ Journal of Soils and Sediments ISSN 1439-0108	Rastetter N./ 2016	
Eucyclops macrurus (Crustacea, Copepoden)	acetic acid, acut		pH=3,5	decreased activity	Entwicklung neuer Einsatzmöglichkeiten des Multispecies Freshwater Biomonitor: Messeinheit für Meiofauna und Anwendung in der Bodentoxikologie/ Diplomsemesterbericht	Schmidt S./ 2002	
Eucyclops serrulatus (Crustacea, Copepoden)	BPA, chronisch		10 µg/L	decreased survival	Entwicklung eines Biosensors zur online Überwachung der Auswirkungen von Schadstoffen auf Eucyclops serrulatus (Copepoden)/ Projektarbeit	Mahlke J./ 2016	
Gambusia holbrooki (Pisci, Osteichthyes)	AMD (acid mine drainage), acut	48h: pH-AMD= 5,8	pH=7-5,5 pH= 5-5,5	0-6h exposition: decreased movement, 0-6h exposition: increased ventilation	Evidence for the Stepwise Stress Model: Gambusia holbrooki and Daphnia magna under Acid Mine Drainage and Acidified Reference Water Stress/ Environ. Sci. Technol. 2005, 39, 4150-4158	Gerhardt A./ 2005	
Gambusia holbrooki (Pisci, Osteichthyes)	Fluoxetine, Diaznon and Triclosan		10 µg/L (96h)	disturbance of the diurnal activity pattern	Diurnal activity patterns as a sensitive behavioural outcome in fish: effect of short-term exposure to treated sewage and a sub-lethal PPCP mixture/ Journal of Applied Toxicology (2016)	Melvin S.D./ 2016	
Gammarus fossarum (Crustacea, Amphipoda)	BPA, acut		5000 µg/L	decreased activity	Entwicklung eines neuen Testsystems für die Bewertung der Effekte von Bisphenol A auf verschiedene Süßwasserkrebse/ Masterthesis	Ritzel J./ 2016	
Gammarus fossarum (Crustacea, Amphipoda)	BPA, acut		100 µg/L	decreased activity	Entwicklung eines neuen Testsystems für die Bewertung der Effekte von Bisphenol A auf verschiedene Süßwasserkrebse/ Masterthesis	Ritzel J./ 2016	
Gammarus fossarum (Crustacea, Amphipoda)	Mikroplastik (Polyphenylenoxid, Polypropylen), chronic		0,1 g	increased movement	Untersuchungen zum Gefährdungspotential von Mikroplastik für Bachflohkrebse (Gammarus fossarum)/ Masterarbeit	Schaefer M./ 2015	
Gammarus fossarum (Crustacea, Amphipoda)	Cu, acut		25 µg/L	decreased movement	Acute toxicity tests of Copper and Bisphenol A with baby Gammarus fossarum and acute and chronic toxicity tests of Carbamazepine with adults Niphargus Casparyi/ Praktikumsbericht	Fruja S./ 2016	
Gammarus fossarum (Crustacea, Amphipoda)	BPA, acut		bis 750 µg/L	no significant effect	Acute toxicity tests of Copper and Bisphenol A with baby Gammarus fossarum and acute and chronic toxicity tests of Carbamazepine with adults Niphargus Casparyi/ Praktikumsbericht	Fruja S./ 2016	
Gammarus fossarum (Crustacea, Amphipoda)	Pulp deposit: aluminium (26,7 mg/kg); barium (4,3 mg/kg); cadmium (2,58 mg/kg); PCB (16,2 mg/kg); PAH (21,5 mg/kg); EOX (12,3 mg/kg), acut		12,5 % dilution	2h exposition: increased activity	Integrated toxicity evaluation of a pulp deposit using organisms of different trophic levels/ Sediments, sec 1, Sediment quality and impact assessment	Kienle C./ 2013	
Gammarus pulex (Crustacea, Amphipoda)	River monitoring, acut				Biomonitoring with Gammarus pulex at the Meuse (NL), Aller (GER) and Rhine (F) rivers with the online Multispecies Freshwater Biomonitors/ Journal of Environmental Monitoring (2007)	Gerhardt A./ 2007	The MFB with G. pulex is usable to evaluate rivers. If a pollution was recognized a alarm was triggered
Gammarus pulex (Crustacea, Amphipoda)	River monitoring: WWTP (waste water treatment plants)			decreased feeding downstream of the WTT	GamTox® <i>in situ</i> test for monitoring streams below waste water treatment plants/ Current Trends in Ecology	Gerhardt A./ 2013	
Gammarus pulex (Crustacea, Amphipoda)	WWTP, acut	96h: dilution 1:40			Abwertoxizität und -überwachung mit dem Bachflohkrebsen Gammarus pulex (L) und Gammarus tigrinus (Sexton) (Crustacea: Amphipoda)/ Wasser & Boden, 52/10, 19-26 (2000)	Gerhardt A./ 2000	It shows that the MFB is a sensitiv analyser for monitoring incidence and quality check of final effluent
Gammarus pulex (Crustacea, Amphipoda)	pH-value, chronic		< pH= 6,8	change in the behavior according to the Stepwise Stressmodel	Quality control of drinking water from the River Rhine with the Multispecies Freshwater Biomonitor/ Aquatic Ecosystem Health & Management, DOI: 10.1080/14634980301466	Gerhardt A./ 2003	G. pulex lived longer than D. magna and showed stabile movement patterns
Gammarus pulex (Crustacea, Amphipoda)	Cu, acut		≤ 0,05 mg/L	30 min exposition: increased ventilation and decreased movement	Monitoring Behavioural Responses to Metals in Gammarus pulex (L.) (Crustacea) with Impedance Conversion/ ESPR- Environ. Sci. & Pollut. Res. 2 (1) 15-23 (1995)	Gerhardt A./ 1995	
Gammarus pulex (Crustacea, Amphipoda)	Pb, acut	96h: 0,12 mg/L (Garmendia Tolosa & Axelsson 1993)	5h: ≥0,05 mg/L, 1h: ≥0,01 mg/L	decreased activity, increased ventilation	Monitoring Behavioural Responses to Metals in Gammarus pulex (L.) (Crustacea) with Impedance Conversion/ ESPR- Environ. Sci. & Pollut. Res. 2 (1) 15-23 (1995)	Gerhardt A./ 1995	
Gammarus pulex (Crustacea, Amphipoda)	Cu, acut		bis zu 50 µg/L	decreased movement, increased ventilation	Monitoring Behavioural Responses to Metals in Gammarus pulex (L.) (Crustacea) with Impedance Conversion/ ESPR- Environ. Sci. & Pollut. Res. 2 (1) 15-23 (1995)	Gerhardt A./ 1995	
Gammarus pulex (Crustacea, Amphipoda)	polluted water (metals and organic Xenobiotika)		1h	decreased activity	Behavioural Early Warning Responses to Polluted Water/ ESPR- Environ. Sci. & Pollut. Res 3 (2) 63-70 (1996)	Gerhardt A./ 1996	It shows, that G pulex is a sensitiv and fast reacting biosensor

Zeigertierart	Stoff	LC50	LOEL	Effekt	Quelle	Autor/ Jahr	Sonstiges
Gammarus pulex (Crustacea, Amphipoda)	Cu 2+, acut		70 µg/L	increased activity, movement and ventilation	New Online Biomonitoring System for Gammarus pulex (L.) (Crustacea): In Situ Test Below a Copper Effluent in South Sweden/ Environ. Sci. Technol. 1998, 32, 150-156	Gerhardt A./ 1998	
Gammarus pulex (Crustacea, Amphipoda)	Cadmium		0,05 mg/L	decreased feeding and ventilation	Development of a feeding behavioural bioassay using the freshwater amphipod Gammarus pulex and the Multispecies Freshwater Biomonitor/ Chemosphere 75 (2009) 341-346	Alonso A./ 2008	Frequency of 3,0 -4,5 Hz correlate with feeding
Gammarus pulex (Crustacea, Amphipoda)	Cadmium+starvation				Effects of animal starvation on the sensitivity of the freshwater amphipod Gammarus pulex to cadmium/ Chemistry and Ecology, 26: 3, 233-242	Alonso A./ 2010	Influence of hunger on G.Pulex according to Cd tolerance : Animals without food for 5-7 d showed a higher tolerance to lower Cd concentrations (0,1 mg/L)
Gammarus pulex (Crustacea, Amphipoda)	Fluoxetine, acut		10 ng/L	increased ventilation	Changes in Ventilation and Locomotion of Gammarus pulex (Crustacea, Amphipoda) in Response to Low Concentrations of Pharmaceuticals/ Human and Ecological Risk Assessment: An International Journal, 15:1, 111-120	De Lange H.J./ 2009	
Gammarus pulex (Crustacea, Amphipoda)	Ibuprofen, acut		1 ng/L	increased ventilation	Changes in Ventilation and Locomotion of Gammarus pulex (Crustacea, Amphipoda) in Response to Low Concentrations of Pharmaceuticals/ Human and Ecological Risk Assessment: An International Journal, 15:1, 111-120	De Lange H.J./ 2009	
Gammarus pulex (Crustacea, Amphipoda)	Carbamazepin, acut		10 ng/L	increased ventilation	Changes in Ventilation and Locomotion of Gammarus pulex (Crustacea, Amphipoda) in Response to Low Concentrations of Pharmaceuticals/ Human and Ecological Risk Assessment: An International Journal, 15:1, 111-120	De Lange H.J./ 2009	
Gammarus pulex (Crustacea, Amphipoda)	Cetyltrimethylammonium Bromid (CTAB), acut		0,01 mg/L	increased ventilation	Changes in Ventilation and Locomotion of Gammarus pulex (Crustacea, Amphipoda) in Response to Low Concentrations of Pharmaceuticals/ Human and Ecological Risk Assessment: An International Journal, 15:1, 111-120	De Lange H.J./ 2009	
Gammarus pulex (Crustacea, Amphipoda)	WWTP, acut	4d: 0,5 g	2d exposition: 0,5 g	decreased activity	Toxic potential of different types of sewage sludge as fertiliser in agriculture: ecotoxicological effects on aquatic, sediment and soil indicator species/ Journal of Soils and Sediments ISSN 1439-0108	Rastetter N./ 2016	
Gammarus pulex (Crustacea, Amphipoda)	Tributyltin (TBT), acut	24h: 1 µg/L	0,5 µg/L	increased ventilation	Assessment of Acute Toxicity of Tributyltin on Gammarus fossarum using the Multispecies Freshwater Biomonitor©/ Intern. Journal of Modern Engineering Research (IJMER), 6 (7): www.ijmer.com (open access)	Mathew M./ 2016	
Gammarus pulex (Crustacea, Amphipoda)	Fluoxetine, acut		10-100 ng/L	decreased activity	Behavioural responses of Gammarus pulex (Crustacea, Amphipoda) to low concentrations of pharmaceuticals/ Aquatic Toxicology 78 (2006) 209-216	De Lange H.J./ 2006	The change in the behaviour patterns was measured at concentration, which were 10 ⁴ -10 ⁷ lower than all recorded LOEC before
Gammarus pulex (Crustacea, Amphipoda)	Ibuprofen, acut		1-10 ng/L	decreased activity	Behavioural responses of Gammarus pulex (Crustacea, Amphipoda) to low concentrations of pharmaceuticals/ Aquatic Toxicology 78 (2006) 209-216	De Lange H.J./ 2006	The change in the behaviour patterns was measured at concentration, which were 10 ⁴ -10 ⁷ lower than all recorded LOEC before
Gammarus pulex (Crustacea, Amphipoda)	Carbamazepine, acut		10-100 ng/L	decreased activity	Behavioural responses of Gammarus pulex (Crustacea, Amphipoda) to low concentrations of pharmaceuticals/ Aquatic Toxicology 78 (2006) 209-216	De Lange H.J./ 2006	The change in the behaviour patterns was measured at concentration, which were 10 ⁴ -10 ⁷ lower than all recorded LOEC before
Gammarus pulex (Crustacea, Amphipoda)	Cetyltrimethylammonium Bromid (CTAB), acut		10-100 mg/L	decreased activity	Behavioural responses of Gammarus pulex (Crustacea, Amphipoda) to low concentrations of pharmaceuticals/ Aquatic Toxicology 78 (2006) 209-216	De Lange H.J. / 2006	The change in the behaviour patterns was measured at concentration, which were 10 ⁴ -10 ⁷ lower than all recorded LOEC before
Gammarus pulex (Crustacea, Amphipoda)	activated carbon (AC), akut			no effect	Ecotoxicological Effects of Activated Carbon Amendments on Macroinvertebrates in Nonpolluted and Polluted Sediments/ Environmental Science & Technology	Kupryanchyk D./ 2011	
Gammarus pulex (Crustacea, Amphipoda)	Terbutryn, acut		100 µg/L	behavioureffects	Biomonitoring mit Gammariden in einer Kläranlage: Erfolgskontrolle der Reduktion des ökotoxikologischen Potentials in verschiedenen Reinigungsstufen/ Masterthesis	Oßwald K./ 2012	
Gammarus pulex (Crustacea, Amphipoda)	Ammonium, acut		> 100 mg/L	changes in ventilation- und swimbehavior	Biomonitoring mit Gammariden in einer Kläranlage: Erfolgskontrolle der Reduktion des ökotoxikologischen Potentials in verschiedenen Reinigungsstufen/ Masterthesis	Oßwald K./ 2012	
Gammarus pulex (Crustacea, Amphipoda)	Carbamazepin, acut		100 µg/L	changes in ventilation- und swimbehavior	Biomonitoring mit Gammariden in einer Kläranlage: Erfolgskontrolle der Reduktion des ökotoxikologischen Potentials in verschiedenen Reinigungsstufen/ Masterthesis	Oßwald K./ 2012	The behavior effects were just measured without ethanol addition
Gammarus tigrinus (Crustacea, Amphipoda)	WWTP, acut	96h: dilution 1:12,5	1:100-1:50 dilution, 1:25-1:10 dilution	increased locomotion, decreased locomotion and ventilation	Abwassertoxizität und -überwachung mit dem Bachflohkrebsen Gammarus pulex (L.) und Gammarus tigrinus (Sexton) (Crustacea: Amphipoda)/ Wasser & Boden, 52/10, 19-26 (2000)	Gerhardt A./ 2000	It shows that the MFB is a sensitiv analyser for monitoring incidence and quality check of final effluent
Gammarus pulex (Crustacea, Amphipoda)					Biomonitoring in der kommunalen Abwasserreinigung/ Aqua & Gas N° 7/8, 2013	Gerhardt A./ 2013	It shows that the MFB is a sensitiv analyser for monitoring incidence and quality check of final effluent
Heptagenia dalecarlica (Insecta, Ephemeroptera)	Mine Effluents, acut				Assessing ecotoxicity of biomining effluents in stream ecosystems by in situ invertebrate bioassays: a case study in Talvivaara, Finland/ Environmental Toxicology and Chemistry	Salmelin J./ 2016	activity and ventilation increased at places with high metal-pollution. Activity and ventilation decreased at places with high metal-pollution and additional high sulfate level
Hydropsyche angustipennis (Insecta, Trichoptera)	verschmutztes Wasser (Metalle & organische Xenobiotika)		1h	decreased ventilation, increased activity	Behavioural Early Warning Responses to Polluted Water/ ESPR- Environ. Sci. & Pollut. Res. 3 (2) 63-70 (1996)	Gerhardt A./ 1996	It shows, that G pulex is a sensitiv and fast reacting biosensor

Zeigertierart	Stoff	LC50	LOEL	Effekt	Quelle	Autor/ Jahr	Sonstiges
Hydropsyche angustipennis (Insecta, Trichoptera)				higher activity in the chambers, which are filled only with water	The Multispecies Freshwater Biomonitor A Potential New Tool for Sediment Biotests and Biomonitoring/ JSS- J Soils & Sediments 2 (2) 67-70 (2002)	Gerhardt A./ 2002	Comparison of the behaviour in water/ sediment
Hydropsyche pellucidula (Insecta, Trichoptera)	AMD (acid mine drainage), acut		< pH-AMD=7,4	no effect	Behavioural responses of indigenous benthic invertebrates (<i>Echinogammarus meridionalis</i> , <i>Hydropsyche pellucidula</i> and <i>Choroterpes picteti</i>) to a pulse of Acid Mine Drainage: A laboratorial study/ Environmental Pollution 155 (2008) 966-973	Macedo-Sousa J.A./2008	
<i>Lampetra fluviatilis</i> (Pisces, Petromyzontiformes)	PCDD/F, PCB and Hg polluted river sediments, chronic		PCDD/Fs: 19.33 nmol g ⁻¹ dw Hg: 1.2 µg g ⁻¹ dw	no effect	Biological responses of midge (<i>Chironomus riparius</i>) and lamprey (<i>Lampetra fluviatilis</i>) larvae in ecotoxicity assessment of PCDD/F-, PCB- and Hg-contaminated river sediments/ Environmental Science and Pollution Research	Salmelin J./ 2016	no ecotoxicological influence of PCDD/F, PCB & Hg polluted sediments on <i>Chironomus riparius</i> and <i>Lampetra fluviatilis</i> at this concentrations.
<i>Lemma gibba</i> (Plantae, Alismatales)	AMD (acid mine drainage), acut		pH-AMDs 6,4 (4d)	decrease growthrate	Phytoassessment of acid mine drainage: <i>Lemma gibba</i> bioassay and diatom community structure / Ecotoxicology (2008) 17:47-58	Gerhardt A./ 2007	
<i>Leptophlebia marginata</i> (Insecta, Ephemeroptera)	Fe, chronic		24d: 23,47 mg/L	escapebehaviour	Joint and single toxicity of Cd and Fe related to metal uptake in the mayfly <i>Leptophlebia marginata</i> (L.)(Insecta)/ Hydrobiologia 306: 229-240, 1995	Gerhardt A./ 1994	
<i>Leptophlebia marginata</i> (Insecta, Ephemeroptera)	Cd, chronic		24d: 1,10 mg/L	escapebehaviour	Joint and single toxicity of Cd and Fe related to metal uptake in the mayfly <i>Leptophlebia marginata</i> (L.)(Insecta)/ Hydrobiologia 306: 229-240, 1995	Gerhardt A./ 1994	
<i>Leptophlebia marginata</i> (Insecta, Ephemeroptera)	Fe+Cd, chronic		24d: 4,31 mg/L	escapebehaviour	Joint and single toxicity of Cd and Fe related to metal uptake in the mayfly <i>Leptophlebia marginata</i> (L.)(Insecta)/ Hydrobiologia 306: 229-240, 1995	Gerhardt A./ 1994	
<i>Lumbriculus variegatus</i> (Clitellata, Lumbriculida)	size of the sediment, acut				Behavior, Growth, and Reproduction of <i>Lumbriculus Variegatus</i> (Oligochaeta) in Different Sediment Types/ Human and Ecological Risk Assessment: An International Journal, 13, 3, 519-526	Sardo A. M./ 2007	movement, reproduction and growth was best in fine sediment (<1mm), it was also good in coarse sediment >2mm
<i>Lumbriculus variegatus</i> (Clitellata, Lumbriculida)	Pb, acut		0,1 mg/L, from 10 mg/L	increased activity, decreased movement	Importance of Exposure Route for Behavioural Responses in <i>Lumbriculus variegatus</i> Müller (Oligochaeta: Lumbriculida) in Short-Term Exposures to Pb*/ Env. Sci. Pollut. Res. 14 (6) 430- 434 (2007)	Gerhardt A./ 2007	MFB can also be used in sediment
<i>Macrobrachium lanchesteri</i> (Decapoda, Palaemonidae)	Ammonium, acut		1000 ppm	decreased movement (23 %) and ventilation	Behavioral response of <i>Poecilia reticulata</i> (Cyprinodontiformes: Poeciliidae) and <i>Macrobrachium lanchesteri</i> (Decapoda: Palaemonidae) to ammonia stress/ JEP 14, 2025	Mohti A. / 2012	more sensitive biosensor for ammonium than <i>P. reticulata</i>
<i>Macrobrachium lanchesteri</i> (Decapoda, Palaemonidae)	AMD (acid mine drainage), acut		pH-AMDs 6,0	decreased activity	Use of the Multispecies Freshwater Biomonitor to assess behavioral changes of <i>Poecilia reticulata</i> (Cyprinodontiformes: Poeciliidae) and <i>Macrobrachium lanchesteri</i> (Decapoda: Palaemonidae) in response to acid mine drainage: laboratory exposure/ J. Environ. Monit., 2012, 14, 2505-2511	Mohti A. / 2012	metals in AMD together with a low pH-Value had a stronger impact on the animals, than a low pH-Value alone
<i>Macrobrachium nipponense</i> (Crustacea, Palaemonidae)	WWTP, waste water from teramycin producing pharmaceutical industry, acut	6h: dilution= 44% (WWTP) 18h: dilution= 26% (WWTP) 18h: dilution 4 % (pharmaceutical)			Short-term responses of <i>Oryzias latipes</i> (Pisces: Adrianichthyidae) and <i>Macrobrachium nipponense</i> (Crustacea: Palaemonidae) to municipal and pharmaceutical waste water in Beijing, China: survival, behaviour, biochemical biomarkers/ Chemosphere 47 (2002) 35-47	Gerhardt A./ 2001	
<i>Niphargus aquilex</i> (Crustacea, Amphipoda)	BPA, acut		200 µg/L	decreased activity	Entwicklung eines neuen Testsystems für die Bewertung der Effekte von Bisphenol A auf verschiedene Süßwasserkrebse/ Masterthesis	Ritzel J./ 2016	
<i>Niphargus Casparyi</i>	Carbamazepin, acut		up to 750 µg/L	no significant effect	Acute toxicity tests of Copper and Bisphenol A with baby <i>Gammarus fossarum</i> and acute and chronic toxicity tests of Carbamazepine with adults <i>Niphargus Casparyi</i> / Praktikumsbericht	Fruja S./ 2016	
<i>Niphargus Casparyi</i>	Carbamazepin, chronic		up to 750 µg/L	no significant effect	Acute toxicity tests of Copper and Bisphenol A with baby <i>Gammarus fossarum</i> and acute and chronic toxicity tests of Carbamazepine with adults <i>Niphargus Casparyi</i> / Praktikumsbericht	Fruja S./ 2016	
<i>Oncorhynchus mykiss</i> (Pisces, Salmoniformes)	AMD (acid mine drainage), acut	96h: dilution von 10 %	≤ 50% dilution	decreased activity, increased ventilation	Whole Effluent Toxicity Testing with <i>Oncorhynchus mykiss</i> (Walbaum 1792): Survival and Behavioral Responses to a Dilution Series of a Mining Effluent in South Africa/ Arch. Environ. Contam. Toxicol., 35, 309-316 (1998)	Gerhardt A./ 1998	it shows, that <i>O. mykiss</i> is a sensitive and fast reacting biosensor
<i>Oryzias latipes</i> (Pisces, Beloniformes)	WWTP, waste water from teramycin producing pharmaceutical industry, acut	18h: dilution 27 % (pharmaceutical)			Short-term responses of <i>Oryzias latipes</i> (Pisces: Adrianichthyidae) and <i>Macrobrachium nipponense</i> (Crustacea: Palaemonidae) to municipal and pharmaceutical waste water in Beijing, China: survival, behaviour, biochemical biomarkers/ Chemosphere 47 (2002) 35-47	Gerhardt A./ 2001	
<i>Pleurodera cinereum</i>	Cr, akut		5ppm	increased ventilation	Behavioral bioassay with local Tadpole (<i>Pleurodera cinereum</i>) from river Rocha, Bolivia, in river water spiked with Chromium6+/ Bull. Environ. Contam. Toxicol. (2004) 72: 422-428	Janssens de Bisthoven L./ 2003	Animals, which were in their active phase showed an increase in their ventilation. Animals, which were in their passive phase showed no significant ventilation increase
<i>Poecilia reticulata</i> (Pisces, Poeciliidae)	Ammonium (NH3N), acut		1000 ppm	decreased movement (7%) and ventilation	Behavioral response of <i>Poecilia reticulata</i> (Cyprinodontiformes: Poeciliidae) and <i>Macrobrachium lanchesteri</i> (Decapoda: Palaemonidae) to ammonia stress/ JEP 14, 2025	Mohti A./ 2012	
<i>Poecilia reticulata</i> (Pisces, Poeciliidae)	AMD (acid mine drainage), acut		pH-AMDs 5,0	decreased activity	Use of the Multispecies Freshwater Biomonitor to assess behavioral changes of <i>Poecilia reticulata</i> (Cyprinodontiformes: Poeciliidae) and <i>Macrobrachium lanchesteri</i> (Decapoda: Palaemonidae) in response to acid mine drainage: laboratory exposure/ Journal of Environmental Monitoring, 2012, 14, 2505-2511	Mohti A./ 2012	Metals in AMD together with a low pH-Value had a stronger impact on the animals, than a low pH-Value alone
<i>Poecilia reticulata</i> (Pisces, Poeciliidae)	WWTP, acut		50 % Verdünnung	decreased activity, increased movement Bewegung, dark discolouring	Analysis of Effluent Quality from Sewage Treatment Plant with <i>Poecilia Reticulata</i> as Indicator Organism in Multispecies Freshwater Biomonitor©	Mathew M./ i.A.	

Zeigertierart	Stoff	LC50	LOEL	Effekt	Quelle	Autor/ Jahr	Sonstiges
Proasellus slavus (Malacostraca, Isopoda)	BPA, acut		200 µg/L	change in the activity	Entwicklung eines neuen Testsystems für die Bewertung der Effekte von Bisphenol A auf verschiedene Süßwasserkrebse/ Masterthesis	Ritzel J./ 2016	
Proasellus slavus (Malacostraca, Isopoda)	BPA, chronic			up to 100 µg/L no effect	Entwicklung eines neuen Testsystems für die Bewertung der Effekte von Bisphenol A auf verschiedene Süßwasserkrebse/ Masterthesis	Ritzel J./ 2016	
Pterostichus oblongopunctatus (Insecta, Coleoptera)	Nickel, chronic		2500 mg/kg	increased ventilation increased movement	Locomotor activity and respiration rate of the ground beetle, Pterostichus oblongopunctatus (Coleoptera: Carabidae), exposed to elevated nickel concentration at different temperatures: novel application of Multispecies Freshwater Biomonitor® / Ecotoxicology (2010) 19:864-871	Bednarska A. J./ 2010	
Tubifex tubifex (Clitellata, Oligochaeta)	Cd, acut	4,9 mg/L	EC50: mg/L	decreased movement	Screening the Toxicity of Ni, Cd, Cu, Ivermectin, and Imidacloprid in a Short- Term Automated Behavioral Toxicity Test with Tubifex tubifex (Müller 1774) (Oligochaeta)/ HERA 15 (1)	Gerhardt A./ 2009	
Tubifex tubifex (Clitellata, Oligochaeta)	Cu 2+, acut	15,2 mg/L	EC50: 3,8 mg/L	decreased movement	Screening the Toxicity of Ni, Cd, Cu, Ivermectin, and Imidacloprid in a Short- Term Automated Behavioral Toxicity Test with Tubifex tubifex (Müller 1774) (Oligochaeta)/ HERA 15 (1).	Gerhardt A./ 2009	
Tubifex tubifex (Clitellata, Oligochaeta)	Ni, acut	>100 mg/L	EC50: 86 mg/L	decreased movement	Screening the Toxicity of Ni, Cd, Cu, Ivermectin, and Imidacloprid in a Short- Term Automated Behavioral Toxicity Test with Tubifex tubifex (Müller 1774) (Oligochaeta)/ HERA 15 (1).	Gerhardt A./ 2009	
Tubifex tubifex (Clitellata, Oligochaeta)	Imidacloprid, acut	0,3 mg/L	EC50: 0,09 mg/L	decreased movement	Screening the Toxicity of Ni, Cd, Cu, Ivermectin, and Imidacloprid in a Short- Term Automated Behavioral Toxicity Test with Tubifex tubifex (Müller 1774) (Oligochaeta)/ HERA 15 (1).	Gerhardt A./ 2009	
Tubifex tubifex (Clitellata, Oligochaeta)	Ivermectin, acut	1,8 mg/L	EC50: 2,0 mg/L	decreased movement	Screening the Toxicity of Ni, Cd, Cu, Ivermectin, and Imidacloprid in a Short- Term Automated Behavioral Toxicity Test with Tubifex tubifex (Müller 1774) (Oligochaeta)/ HERA 15 (1).	Gerhardt A./ 2009	
Tubificidae (Clitellata, Oligochaeta)	acetic acid, acut		pH=5	decreased movement	Entwicklung neuer Einsatzmöglichkeiten des Multispecies Freshwater Biomonitor: Messeinheit für Meiofauna und Anwendung in der Bodentoxikologie/ Diplomsemesterbericht	Schmidt S./ 2002	