

**Response of *Diamesa* spp. (Diptera: Chironomidae) from Alpine streams to newly emergent contaminants and pesticides**

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**Tab. S1.** Main physicochemical features of the three study sites, in February (TP\_up and TP\_dw) and in September (PR0) 2016.

	TP_up	TP_dw	PR0
Latitude;	N46°15.566;	N46°15.580';	N46°13.596';
Longitude (WGS84 GPS)	E010°36.271	E010°36.330'	E010°34.929'
Altitude (m a.s.l.)	1792	1790	2685
Temperature (°C)*	2.8	4.2	1.4
pH*	7.7	7.8	7
Conductivity ( $\mu\text{S cm}^{-1}$ )*	200	214	12
O <sub>2</sub> saturation (%)*	94	92	98
Turbidity (NTU)*	7	30	72
Discharge ( $\text{L s}^{-1}$ )	27.0	17.7	17.3
Alcalinity ( $\text{mg CaCO}_3 \text{ L}^{-1}$ )	96.3	107.8	8.8
Hardness (°F)	9.9	11.2	0.7
N-NO <sub>3</sub> ( $\mu\text{g L}^{-1}$ )	808	3211	120
N-NH <sub>3</sub> ( $\mu\text{g L}^{-1}$ )	107	67	6
N <sub>tot</sub> ( $\mu\text{g L}^{-1}$ )	1704	4575	157
P-PO <sub>4</sub> ( $\mu\text{g L}^{-1}$ )	67	450	2
P <sub>tot</sub> ( $\mu\text{g L}^{-1}$ )	112	560	10
SiO <sub>2</sub> ( $\text{mg L}^{-1}$ )	8.9	8.0	1.3
SO <sub>4</sub> ( $\text{mg L}^{-1}$ )	12.0	13.0	0.5
Suspended solids ( $\text{mg L}^{-1}$ )	3.0	2.7	6.8
Chlorophyll <i>a</i> ( $\mu\text{g cm}^{-2}$ )	1.34	1.29	0.10

\*= parameters recorded in the field during the first day of sampling using a field multi-probe (Hydrolab Quanta, Hydrolab Corporation®, Texas, USA); discharge was measured by the salt dilution method (Hongve, 1987); suspended solids were evaluated by filtering 500 mL of water through 0.45- $\mu\text{m}$ -membrane MFS filters and drying at 105°C for 30 min. Nutrients, silica, and ions in 1 L of stream water were measured in the laboratory according to Standard Methods (APHA, 2005). Standing crop of algae was estimated as chlorophyll *a* concentration by scraping, at each site and date, an area of 9 cm<sup>2</sup> from three stones selected randomly from the channel. Chlorophyll *a* was extracted with 90% acetone and the concentration was read at 665 and 750 nm according to Standard Methods (APHA, 2005).

**Tab. S2.** Physico-chemical properties and concentrations of the 11 pollutants tested in *Diamesa cinerella* (Dc) and *Diamesa zernyi* (Dz). In the Vermigliana stream pollutants were measured in winter, in Presena in summer. Risk level was performed by S. Villa S. and V. Di Nica (Lencioni *et al.*, 2017).

Molecule acronym	Furosemide FUR	Ibuprofen IBU	Trimethoprim TMP	Triclocarban TCC	Sucralose SUCR	Tonalid TON	Boscalid BOS	Captan CAP	Chlorpyrifos CPS	Metolachlor MET	Terbutylazine TER
Product code (Sigma-Aldrich)	F4381	I4883	92131	105937	69293	W526401	33875	32054	45395	36163	45678
Category	Diuretic	NSAID	Antibiotic	Antibacterial	Artificial Sweetener	Fragrance	Fungicide	Fungicide	Insecticide	Herbicide	Herbicide
Risk index	Low	Medium	Medium	High	Low	Low	Medium	High	Very high	N.A.	N.A.
Molecular weight (g mol <sup>-1</sup> )	330.7	206.3	290.3	315.6	397.6	258.4	343.2	300.6	350.6	283.8	229.7
Koc (L kg <sup>-1</sup> )	302	238	75	4057	10	6309-63000	809	200	8151	22-2320	151-514
Vapor pressure	3.20E-10	4.74E-05	2.40E-14	3.60E-09	3.20E-14	5.12E-04	7.20E-07	4.20E-06	1.43E-03	3.14E-05	6.75E-07
Water solubility (mg L <sup>-1</sup> )	73.1	21	400	2.37E-03	2.27E+04	1.25	4.6	5.2	1.05	530	9
Log K <sub>ow</sub>	2.0	3.8	0.9	4.9	-1.0	5.7	3.0	2.8	5.0	3.1	3.4
Tested species	Dc, Dz	Dc, Dz	Dc, Dz	Dc, Dz	Dz	Dz	Dz	Dz	Dz	Dz	Dz
Environmental Concentration (EC)	*359 ng L <sup>-1</sup>	°619 ng L <sup>-1</sup> ; †327 ng L <sup>-1</sup>	*176 ng L <sup>-1</sup>	** 105 ng L <sup>-1</sup>	°600 µg L <sup>-1</sup>	**209.3 ng L <sup>-1</sup>	**5.32 µg L <sup>-1</sup>	**38.7 µg L <sup>-1</sup>	°°6.83 ng L <sup>-1</sup>	°°4.62 ng L <sup>-1</sup>	°°1.5 ng L <sup>-1</sup>
Range Experimental Concentrations (C)	1-500 mg L <sup>-1</sup>	1-100 mg L <sup>-1</sup>	0.001-400 mg L <sup>-1</sup>	1-100 µg L <sup>-1</sup>	42.7 g L <sup>-1</sup>	100 mg L <sup>-1</sup>	5-500 µg L <sup>-1</sup>	1-150 mg L <sup>-1</sup>	0.5-100 µg L <sup>-1</sup>	2.5-250 mg L <sup>-1</sup>	10-25 mg L <sup>-1</sup>
Cmin/EC	2,786	1,616	6	10	-	-	1	3	732	541,126	6,666,667
Cmax/EC	1,392,758	161,551	2,272,727	952	71,212	477,783	94	388	14,641	54,112,554	16,666,667

\*Mandarić *et al.* (2017), in TP<sub>dw</sub>; \*\*Predicted Environmental Concentration (PEC<sub>sw</sub>); Lencioni *et al.*, 2017; °Measured Environmental Concentration in TP<sub>dw</sub>; Lencioni *et al.*, 2017; †Measured Environmental Concentration in TP<sub>up</sub>; Lencioni *et al.*, 2017; °°Measured Environmental Concentration in PR0; Lencioni *et al.*, 2017; NSAID, nonsteroidal anti-inflammatory; Log K<sub>ow</sub>, n-octanol/water partition coefficient; Koc, soil organic carbon-water partitioning coefficient.

## REFERENCES

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