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Supplementary table 1: Concentrations of atrazine, glyphosate, imidacloprid and metolachlor reported in water bodies, sediment and soil in sub-Saharan Africa

Country	Area	Active ingredient	Concentration detected (water µg/L) (sediment µg/g)	Matrix	Reference
Burkina Faso	Bazèga	Atrazine	0.0065-0.1808	Surface water	1
		Imidacloprid	0.0008-0.2355		
		Atrazine	0.0002-0.0204	Surface water	
		Imidacloprid	0.0009-0.3840		
		Imidacloprid	0.0018-1.1089	Surface and drinking water (POCIS, 21 days of exposure)	
Cameroon	Yaoundé	Atrazine	0.0004-0.043	Surface water (POCIS, (20±3 days of exposure)	2
		Imidacloprid	0.0022-0.006		
		Metolachlor	0.0001-0.0157		
		Atrazine	0.0087-0.4607	Surface water	
		Imidacloprid	0.0281-0.0771		
		Metolachlor	0.0111-0.0244		
Côte d'Ivoire	Bas-Sassandra	Imidacloprid	n.d.-0.8336	Sediment	3
			n.d.-0.062	Surface water	
Eswatini	Vuvulane	Atrazine	0.003-0.19	Soil	4
			0.0003-0.104	Surface water	
Ethiopia	Arba Minch, Sidama	Atrazine	2.6-6.6	Surface water	5
	Arsi, Dugda Bora, Oromia	Imidacloprid	0.04-0.3	Surface water	6
	Cheha, Dinsho	Glyphosate	0.024-0.21931	Soil	7
		S-metolachlor	0.02367-0.22733		
The Gambia	Kiang West, Kombo Central, Niamina East	Glyphosate	<0.020	Surface water	8
Ghana	Ashanti, Brong Ahafo, Central, Eastern, Volta, Western	Imidacloprid	0.0043-0.2514	Soil	9
	Bamba, Bole, Derna	Atrazine	0.57-1.71	Sediment	10
			0.08-4.02	Surface water	
Kenya	Kakamega	Atrazine	0.003-0.010	Surface water	11
		Imidacloprid	0.005-0.040		

Country	Area	Active ingredient	Concentration detected (water µg/L) (sediment µg/g)	Matrix	Reference
		Metolachlor	0.011-0.250		
	Laikipia	Atrazine	n.d.-76.2	Surface water	12
	Kericho, Kisumu, Kisii, Nyamira, Migori, Narok, Homabay	Atrazine	0.003-0.013	Surface water	13
		Imidacloprid	0.003-0.032		
		Metolachlor	0.002-0.047		
	Machakos	Atrazine	<0.03–3.56	Surface water	14
Malawi	Zomba/Bvumbwe	Atrazine	0.5-2	Surface water	15
		Metolachlor	2.5-5		
Mozambique	Maputo	Atrazine	0.009-0.2	Surface water	16
	Maputo	Atrazine	0.0032-0.066	Surface water	17
The Niger	Zinder	Atrazine	0.008-0.938	Surface water	18
			0.133-0.186	Surface water (POCIS, 15-20 days of exposure)	
Nigeria	Edo State, Ogbesse River	Atrazine	0.94 dry weight	Sediment	19
		Glyphosate	1.20 dry weight		
		Atrazine	0.15	Surface water	
		Glyphosate	0.27		
	Edo State, Owan River	Atrazine	0.94 dry weight	Sediment	20
			0.15	Surface water	
	Edo State, Ikpoba River	Atrazine	$4x10^{-8}$	Sediment	21
		Glyphosate	$9.3x10^{-6}$		
		Atrazine	0.00015	Surface water	
		Glyphosate	0.00002		
South Africa	Free State	Atrazine	3.5-82.3	Surface water	22
	Gauteng	Atrazine	>0.1	Surface water	23
	Mpumalanga, North-West	Atrazine	0.73-298.20	Surface water	24
			0.49-3.89	Groundwater	
	Free State, Mpumalanga, North-West	Atrazine	<0.05-13.45	Surface water	25
	Gauteng	Atrazine	<0.25-1.193	Surface water	26
	North-West	Atrazine	0.39-10	Surface water	27
	Gauteng	Atrazine	0.21-0.70	Surface water	28
	Gauteng	Atrazine	2.4	Wastewater	29
		Metolachlor	Detected**		
	Free State	Atrazine	25.6-33.1	Surface water	30
		Metolachlor	27.7-50.2		
	North-West	Atrazine	0.0015-0.003	Soil	31
		Metolachlor	0.002-0.004		
		Atrazine	0.0005-0.0212	Groundwater	32

Country	Area	Active ingredient	Concentration detected (water µg/L) (sediment µg/g)	Matrix	Reference
South Africa	Free State, Limpopo, Mpumalanga	Imidacloprid	0.00014-0.004	Sediment	
			n.d. – 0.35	Surface water	
			n.d. – 0.0647	Surface water	
	Gauteng, Free State, Western Cape, KwaZulu-Natal, Eastern Cape	Atrazine	0-0.185	Wastewater	33
	Gauteng	Atrazine	0.0004 – 0.0608	Surface water	34
		Metolachlor	0.00019 - 0.00054		
	Gauteng	Atrazine	0.136-1.57	Surface water and groundwater	35
	Border of Free State and North-West	Glyphosate	0.42	Rainwater	36
	KwaZulu-Natal	Atrazine	n.d.-48.7	Wastewater	37
	Free State, Limpopo, Mpumalanga	Atrazine	Detected**	Surface water	38
		Imidacloprid	Detected**		
	Mpumalanga	Atrazine	0.109-0.263	Surface water (Chemcatcher® 14-day exposure)	39
	KwaZulu-Natal	Atrazine	0.173	Surface water	40
			3.2-7.4	Surface water	
			4.2-38	Wastewater	
			0.046	Sediment	
			0.012-0.220	Soil	
	Gauteng	Atrazine	Detected**	Surface water	41
		Metolachlor	Detected**		
	Western Cape	Atrazine	0.0023-0.0232	Surface water	42
		Imidacloprid	0.726-7.249		
		S-metolachlor	0.0016-0.0156		
	Eastern Cape	Atrazine	0.0095-0.8123	Surface water	43
	North-West	Glyphosate	2.9-3.19	Rainwater	44
	Western Cape	Atrazine	0.0016-0.0019	Seawater	45
		Metolachlor	0.0003-0.0023		
		Atrazine	0.0101 dry material	Beach sand	
		Metolachlor	0.0308 dry material		
		Atrazine	0.0216 dry material	Marine Sediment	
		Metolachlor	0.0453 dry material		
	Gauteng	Imidacloprid	0.00464-0.109	Surface water	46

Country	Area	Active ingredient	Concentration detected (water µg/L) (sediment µg/g)	Matrix	Reference
South Africa	KwaZulu-Natal	Atrazine	n.d.- 0.00671	Sediment	47
		Metolachlor	n.d.- 0.0153		
	Limpopo	Imidacloprid	0.21-6.02	Surface water	48
	Western Cape	Atrazine	0.1-27 *	Surface water (Chemcatchers®,14 days exposure)	49
		Imidacloprid	0.2-390 *		
		Metolachlor	0.4-10 *		
	Free State	Atrazine	2-60	Surface water	50
		Metolachlor	2-30		
		Atrazine	15-20	Drinking water	
		Metolachlor	9-10		
	Western Cape	Atrazine	0.0002 13-18 *	Surface water (Passive samplers,14 days sampling)	51
		Imidacloprid	8-160 *		
		Metolachlor	2-10 *		
	Free State	Atrazine	1.4-110	Surface water	52
		Metolachlor	0.7-120		
		Atrazine	3-40	Surface water	
		Metolachlor	10-40		
	Mpumalanga, Northern Cape	Atrazine	10-120	Tap water (treated drinking water)	
		Metolachlor	4-90		
		Atrazine	0.0002-0.160 dry material	Soil	53
		Imidacloprid	0.020-0.097 dry material		
United Republic of Tanzania	Morogoro	Atrazine	0.013	Drinking water	54
			0.016-0.172	Surface water	
		Atrazine	0.46-0.56	Sediment	55
		Glyphosate	0.043-0.24		
		Atrazine	0.11-0.52	Surface water	
		Glyphosate	0.035-0.05		
Uganda	Kabarole, Kyenjojo	Imidacloprid	Detected**		56
		Metolachlor	Detected**		
	Wak- iso	Atrazine	0.044	Drinking water	57
			0.5-0.59	Surface water	
		Imidacloprid	n.d.-0.006		
Zambia	Central	Atrazine	0.019	Sediment	58
		Atrazine	0.07-0.13	Surface water	59
Zimbabwe	Masvingo	Atrazine	6.15	Surface water	60

**Concentration reports as ng/disc*

***Detected; exact concentrations were not provided in the articles or supplementary data*

n.d.; not detected; POCIS, polar organic chemical integrative sampler

Supplementary table 2: Studies investigating the effects of atrazine, glyphosate, imidacloprid and metolachlor on honey bees under local conditions in sub-Saharan Africa. In the majority of the studies, pesticide formulations were used, except for the studies done in South Africa. Where possible, the concentrations were reported as µg/L.

Country	Active ingredient	Concentration	Effect tested for	Formulation / active ingredient	Reference
Benin	Imidacloprid	7.25, 14.5, 36.25, 72.5, 145, 290, 435, 725 ng/uL per bee	Survival	Formulation	61
Ethiopia	Glyphosate	300 µg (±10 µg/bee)	Survival	Formulation	62
Ghana	Glyphosate	10 000 000 and 20 000 000 µg/L	Survival	Formulation	33
Kenya	Glyphosate	2000, 4000, 6000 and 8000 µg/L	Survival	Formulation	64
South Africa	Imidacloprid	0.000959 µg/L	Survival	Active ingredient	65
		0.000639 µg/L	Thermotolerance	Active ingredient	66
		0.000639 µg/L	Flight efficiency	Active ingredient	67

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