Determination of lindane in surface water samples and its degradation by hydrogen peroxide and persulfate assisted TiO$_2$-based photocatalysis

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Table S1. Physico-chemical parameters of the water sample collected from Amangarh, Nowshera (N7) where maximum concentration of lindane (2.60 μg L^{-1}) was detected.

pH	Conductivity (μS)	TOC (mg/L)	TH (mg/L)	T. alkalinity (mg/L)	TSS (mg/L)	TDS (mg/L)	Nitrates (mg/L)	Chlorides (mg/L)	Sulphates (mg/L)	Turbidity (NTU)
7.3	712.8	4.58	286.5	172.5	245.6	368.4	3.4	356.3	86.5	17.6

*T (Total); TOC (Total organic carbon); TH (Total Hardness); TTS (Total suspended solids); TDS (Total dissolved solids)

Table S2. Method validation of SPME followed by GC-ECD, in terms of R^2-value, LOD and LOQ.

Analyte	Equation	Correlation coefficient (R^2)	LOD (μg L^{-1})	LOQ (μg L^{-1})
Lindane	y = 66.71 x + 2.27	0.997	0.008	0.037

Table S3. Cultivation area, cotton production, yield value and pesticides consumed in Pakistan during 1997-2006 (Economic Survey of Pakistan; 2003-2004 and 2005-2006).

Year	Area (Thousand hectares)	Production (Thousand bales)	Yield (kg/ha)	Total pesticides in tones (Imported + Locally manufactured)
1997-98	2960	9184	528	42,732.0
1998-99	2923	8790	512	44,872.0
1999-00	2983	11,240	641	45,232.0
2000-01	2927	10,732	570	44,762.0
2001-02	3116	10,613	579	46,132.0
2002-03	2794	10,211	622	46,943.0
2003-04	2989	10,048	572	47,432.0
2004-05	3193	14,265	760	46,572.0
2005-06	3096	12,417	682	46,951.0

Table S4. Effect of different scavengers on k_{obs} of lindane by solar/TiO$_2$. Experimental conditions: [Lindane]$_0$ = 2.60 μg L^{-1}; [MeOH]$_0$ = [i-PrOH]$_0$ = [BQ]$_0$ = 50 mM; [PDC]$_0$ = 100 μM; Mass of TiO$_2$ film = 9.02 mg; Thickness of TiO$_2$ film = 1.02 μm; Area of TiO$_2$ film = 3750 mm^2; pH = 7.3.

Scavenger	k_{obs} (h^{-1})
Control (No scavenger)	0.0309
Iso-PrOH (i-PrOH)	0.0126
Methanol (MeOH)	0.0089
Benzoquinone (BQ)	0.0258
Potassium dichromate (PDC)	0.0230

Table S5. Acute and chronic toxicities of lindane and its detected DPs towards fish, daphnia

Compound	Acute toxicity (mg/L)			Chronic toxicity (mg/L)		
	LC_{50}	LC_{50}	EC_{50}	ChV	ChV	ChV
	Fish	Daphnia	Green Algae	Fish	Daphnia	Green Algae
Lindane	2.24	1.57	2.76	0.280	0.273	1.15
HCB	0.08	0.065	0.211	0.012	0.017	0.122
TCB	2.77	1.88	2.93	0.334	0.301	1.14
DCB	8.52	5.45	6.62	0.958	0.738	2.26
DCP	25.5	15.6	15.8	2.72	1.87	4.87
CBD	232.0	128.0	84.0	21.9	11.5	20.6

and green algae.