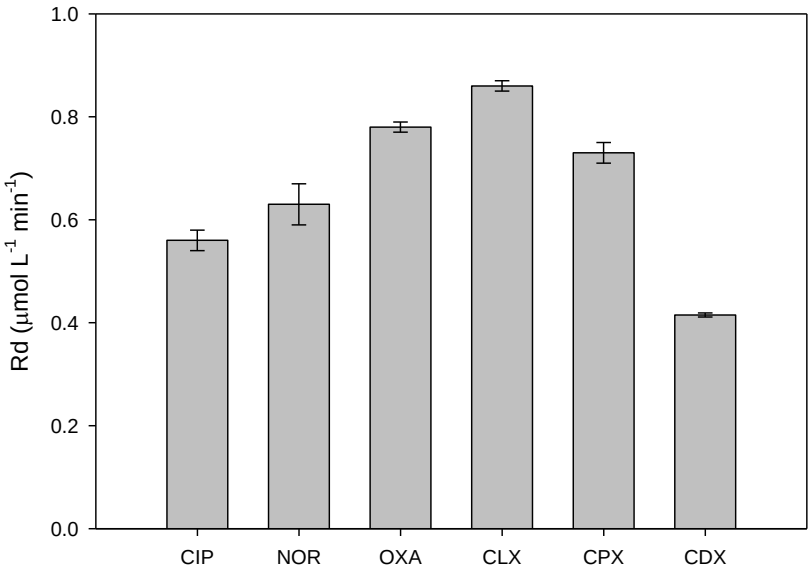
Figure Captions

A



B

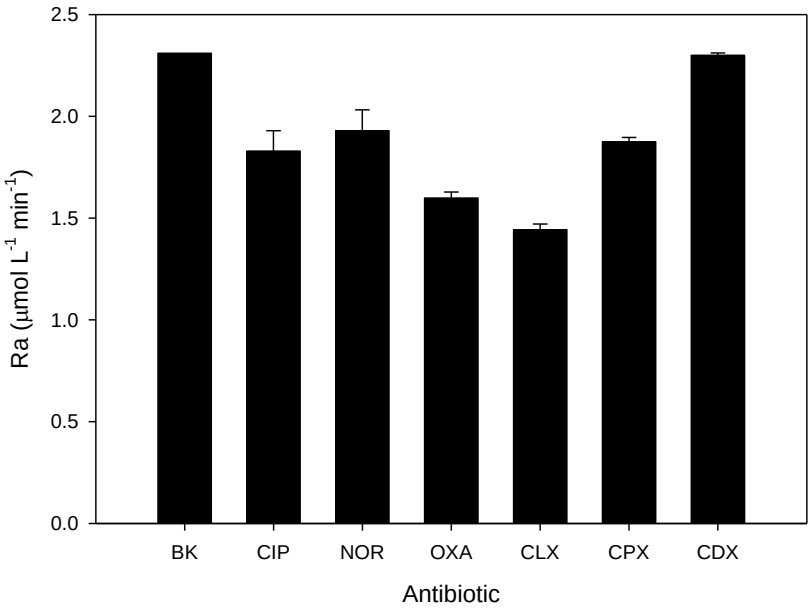
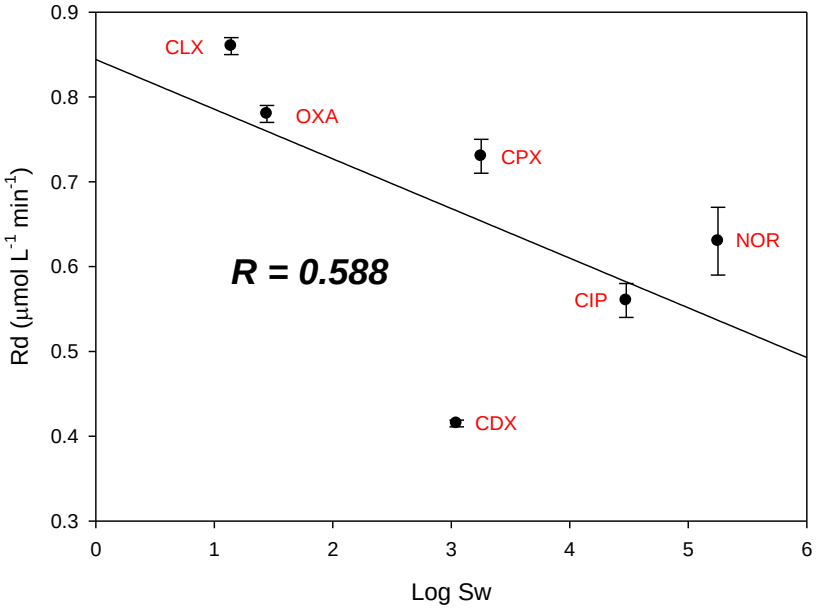
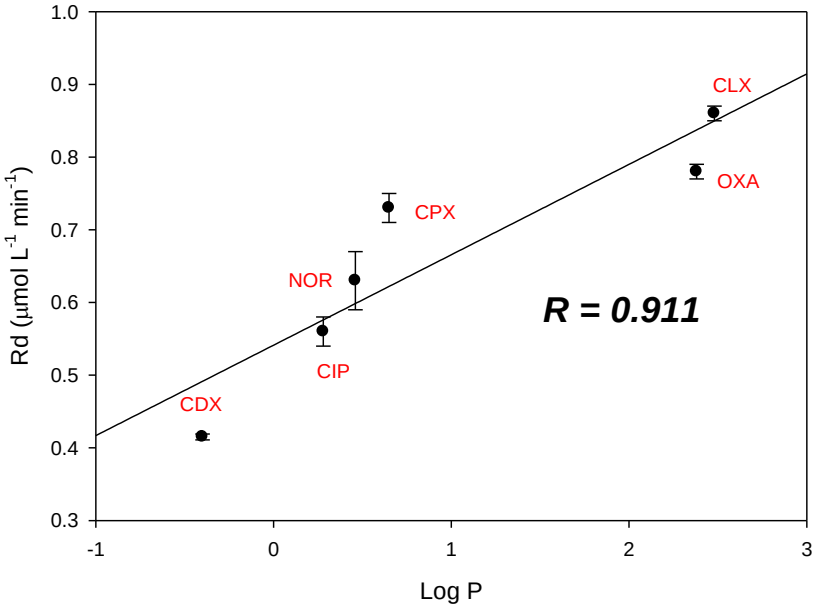


Figure 1. (A). Degradation rates (Rd) for sonochemical treatment of the antibiotics **(B).** Rates of hydrogen peroxide accumulation (Ra) during the degradation process. BK: blank (i.e., distilled water without antibiotics). Conditions: Power density: 88 W L^{-1}, f: 375 kHz, V: 300 mL, [Antibiotics]: 40 µM, $pH_{initial}$: 6.5.

A


0.9
0.8
0.7
0.6
0.5
0.4
0.3
Rd (µmol L-1 min-1)
0
1
2
3
4
5
6
Log Sw
CLX
OXA
CPX
NOR
CIP
CDX
R = 0.588

B


1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
Rd (µmol L-1 min-1)
-1
0
1
2
3
Log P
CLX
OXA
CPX
NOR
CIP
CDX
R = 0.911

C

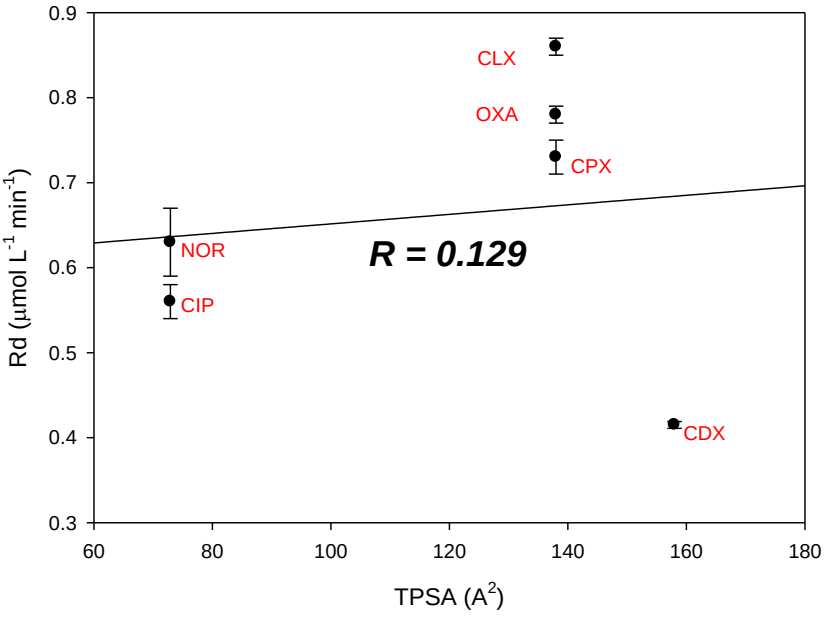


Figure 2. Correlation of physico-chemical properties and degradation rate of the considered antibiotics. (**A**) Rd vs. Solubility in water (Sw). (**B**) Rd vs. Octanol-water partition coefficient (Log P). (**C**) Rd vs. Topological polar surface area (TPSA). The values antibiotics properties were taken from [22].

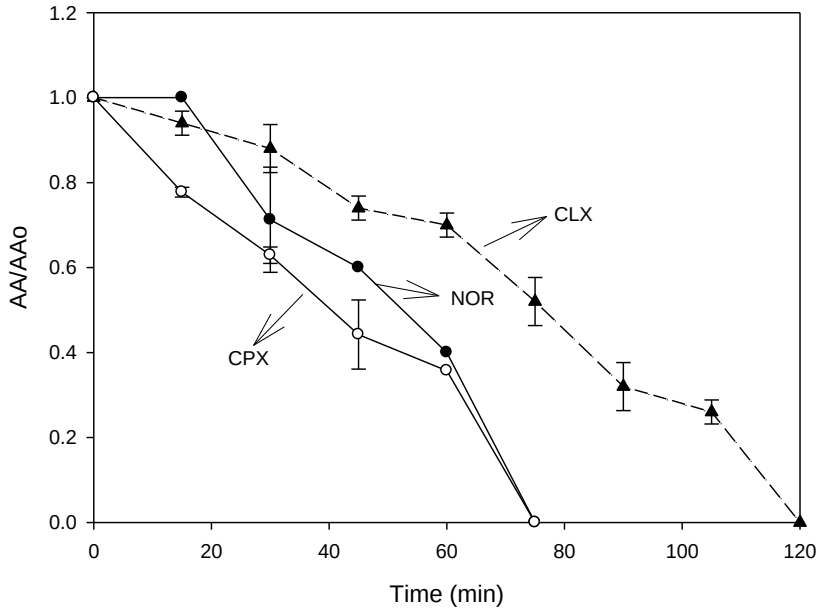
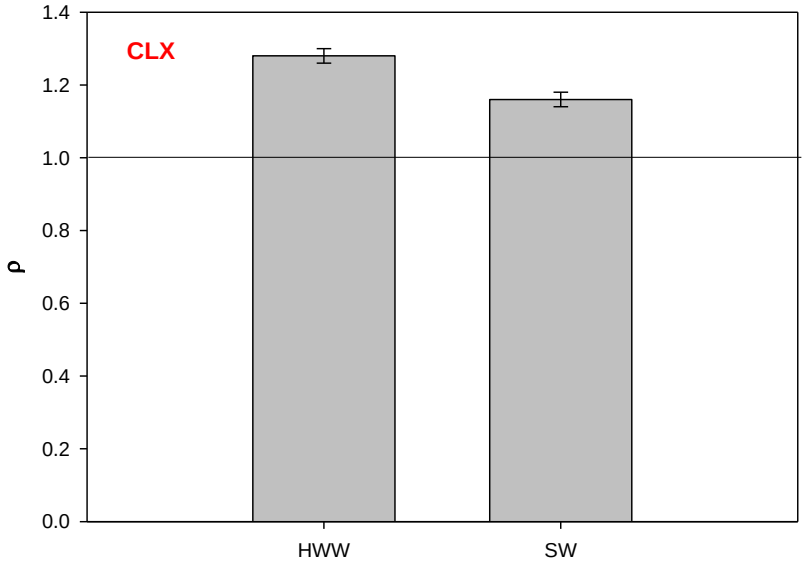


Figure 3. Antimicrobial activity (AA) evolution during the sonochemical treatment of CLX, NOR and CPX. Indicator microorganism: *S. aureus*. Ultrasonic conditions as indicated in Fig. 1.

A


CLX
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
ρ
HWW
SW

B

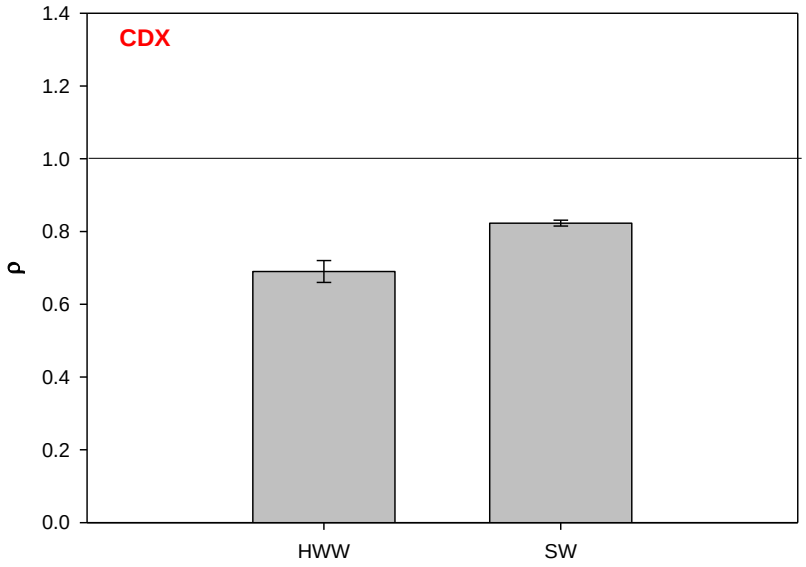

CDX
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
ρ
HWW
SW

Figure 4. Treatment of representative antibiotics by ultrasound in distilled water (DW), hospital wastewater (HWW) and seawater (SW). (**A**) CLX antibiotic. (**B**) CDX antibiotic. Ultrasonic conditions as indicated in **Fig. 1**.

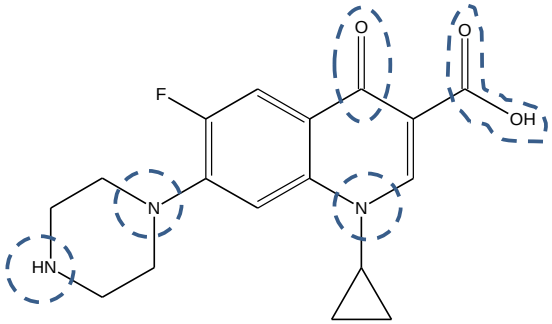
Table captions

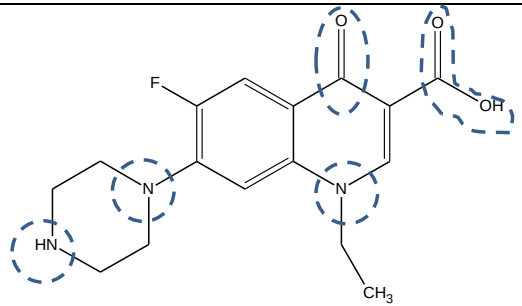
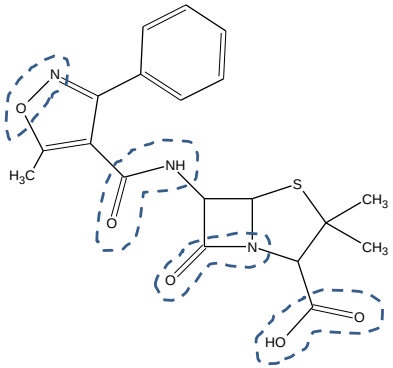
Table 1. Inhibition degree of sonochemical degradation (IDS) by addition of 2-propanol.

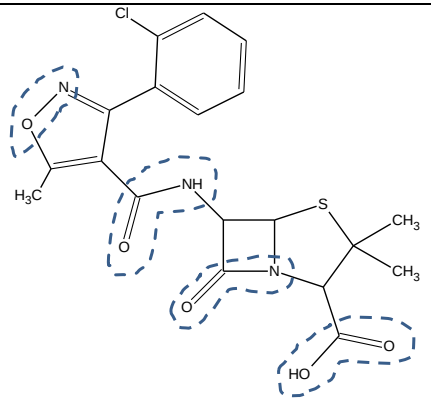
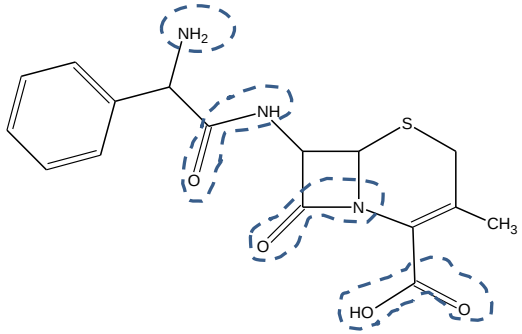
Representative antibiotics	**IDS (%)***
Norfloxacin (NOR)	100
Cephalexin (CPX)	80
Cloxacillin (CLX)	55

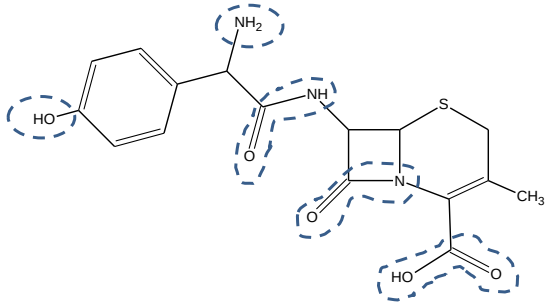
*In presence of IPA (40 mM)

Table 2. Estimation of antibiotics hydrophobicity using the constitutional approach (Lemke method [26]).

Structure (Hydrophilic moieties are signalized with dashed lines)	**Hydrophilic Contribution**			**Hydrophobic contribution**		
CIP 	**Fragment**	**Amount**	**contribution**	**Fragment**	**amount**	**Contribution**
	Amine	3	-3.00	Phenyl	1	+2.00
	Ketone	1	-0.55	Aliphatic carbon	9	+4.50
	Carboxylic Acid	1	-0.70	Fluor	1	+0.14
	Addition of contributions	-4.25		**Addition of contributions**	+6.64	
	Total hydrophobicity = +6.64 -4.25 = 2.39					
NOR	Amine	3	-3.00	Phenyl	1	+2.00
	Ketone	1	-0.55	Aliphatic carbon	8	+4.00
	Carboxylic Acid	1	-0.70	Fluor	1	+0.14

	**Addition of contributions**	-4.25		**Addition of contributions**	+6.14	
	Total hydrophobicity = +6.14 -4.25 = 1.89					
OXA 	Amine	1	-1.00	Phenyl	1	+2.00
	Ether	1	-1.00	Aliphatic carbon	10	+5.00
	Carboxylic Acid	1	-0.70	Thioether	1	+0.00
	Amide	2	-1.40	---	---	---
	Addition of contributions	-4.10		**Addition of contributions**	+7.00	
	Total hydrophobicity = +7.00 -4.10 = -2.90					
CLX	Amine	1	-1.00	Phenyl	1	+2.00
	Ether	1	-1.00	Aliphatic Carbon	10	+5.00

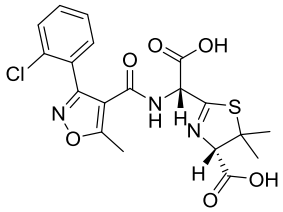
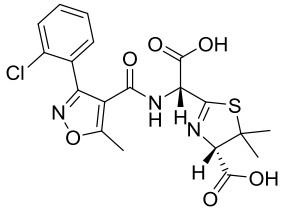
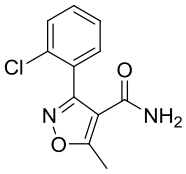
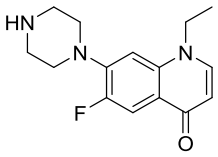
	Carboxylic Acid	1	-0.70	Thioether	1	+0.00
	Amide	2	-1.40	Chloro	1	+ 0.50
	Addition of contributions	-4.10		**Addition of contributions**	+7.50	
	Total hydrophobicity = +7.50 -4.10 = 3.40					
CPX 	Amine	1	-1.00	Phenyl	1	+2.00
	Carboxylic Acid	1	-0.70	Aliphatic carbon	7	+3.50
	Amide	2	-1.40	Thioether	1	+0.00
	---	---	---	---	---	---
	Addition of contributions	-3.10		**Addition of contributions**	+5.50	
	Total hydrophobicity = +5.50 -3.10 = 2.40					
CDX	Amine	1	-1.00	Phenyl	1	+2.00

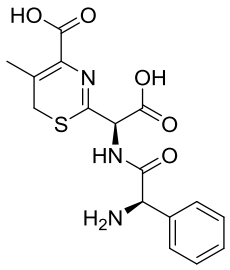


Carboxylic Acid	1	-0.70	Aliphatic carbon	7	+3.50
Amide	2	-1.40	Thioether	1	+0.00
Hydroxyl	1	-1.00	---	---	---
Addition of contributions	-4.10		**Addition of contributions**	+5.50	

Total hydrophobicity = +5.50 -4.10 = 1.40

Table 3. Identified primary degradation products from sonochemical treatment of representative antibiotics.

Parent antibiotic	Transformation product	Chemical name	Calculated ΔLog P*
CLX	DP1 	(S)-2-((R)-carboxy(3-(2-chlorophenyl)-5-methylisoxazole-4-carboxamido)methyl)-5,5-dimethyl-4,5-dihydrothiazole-4-carboxylic acid (***E***)	-3.92
	DP2 	(S)-2-((R)-carboxy(3-(2-chlorophenyl)-5-methylisoxazole-4-carboxamido)methyl)-5,5-dimethyl-4,5-dihydrothiazole-4-carboxylic acid (***Z***)	-3.92
	DP3 	3-(2-chlorophenyl)-5-methylisoxazole-4-carboxamide	-0.97
NOR	DP4 	1-ethyl-6-fluoro-7-(piperazin-1-yl)quinolin-4(1*H*)-one	+0.18
CPX	DP5	2-	-1.47

		[{[amino(phenyl)acetyl]amino}(carboxy)methyl]-5-methyl-6*H*-1,3-thiazine-4-carboxylic acid	

***ΔLog P = Log P of transformation product – Log P of parent antibiotic. The Log P values were calculated using the molinspiration online software** [31]**.**