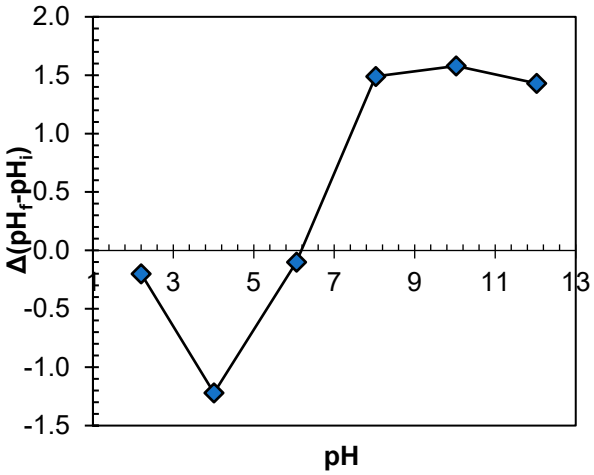
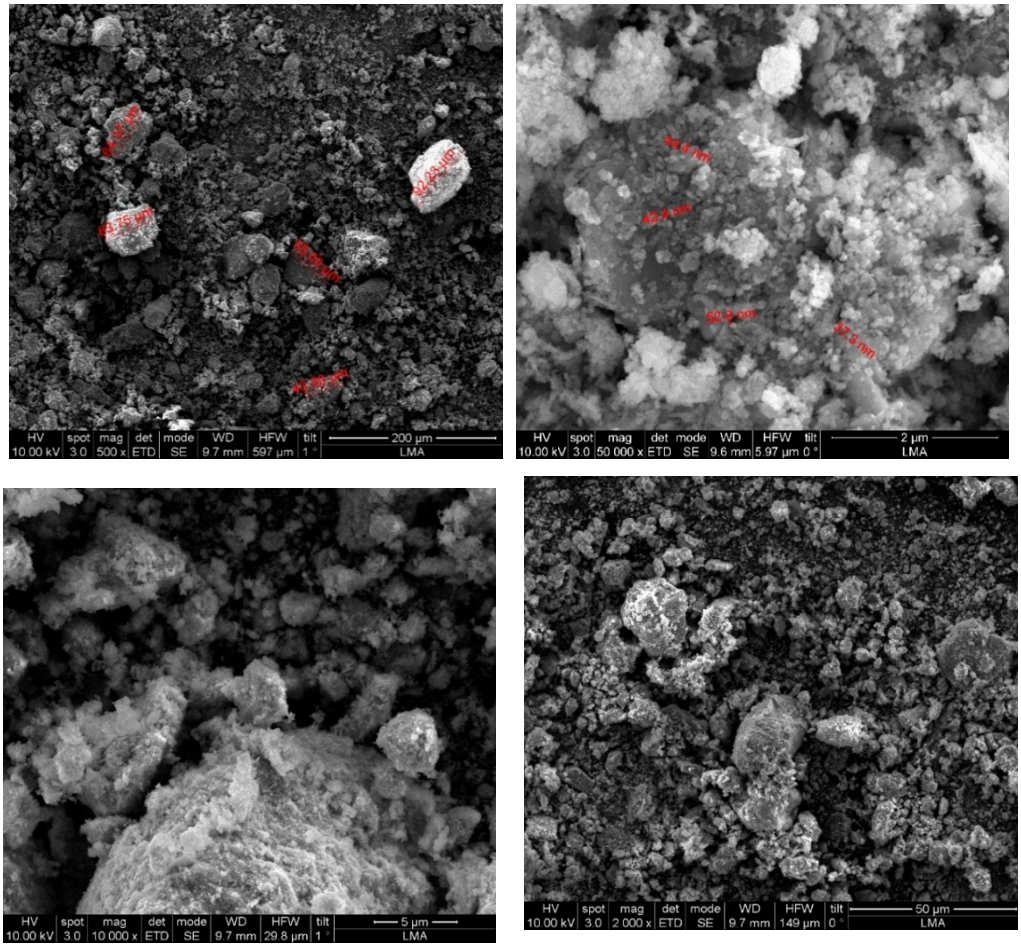
Supplementary information

The Photocatalytic Degradation of Enrofloxacin Using an Ecofriendly Natural Iron Mineral: The Relationship Between the Degradation Routes, Generated Byproducts, and Antimi-crobial Activity of Treated Solutions .

Supplementary figures



(a)



(b)

Figure S1. Characterization of NIM. **(a):** Point of zero charge (PZC). **(b)**: SEM analyses at different levels of magnification

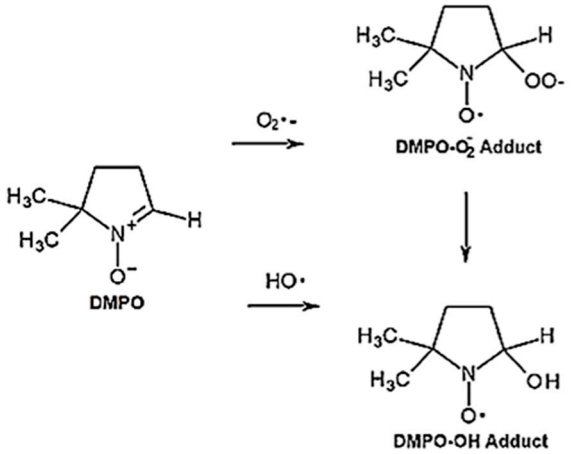


Figure S2. DMPO transformation to DMPO-OH and DMPO-OOH adducts [1–3]

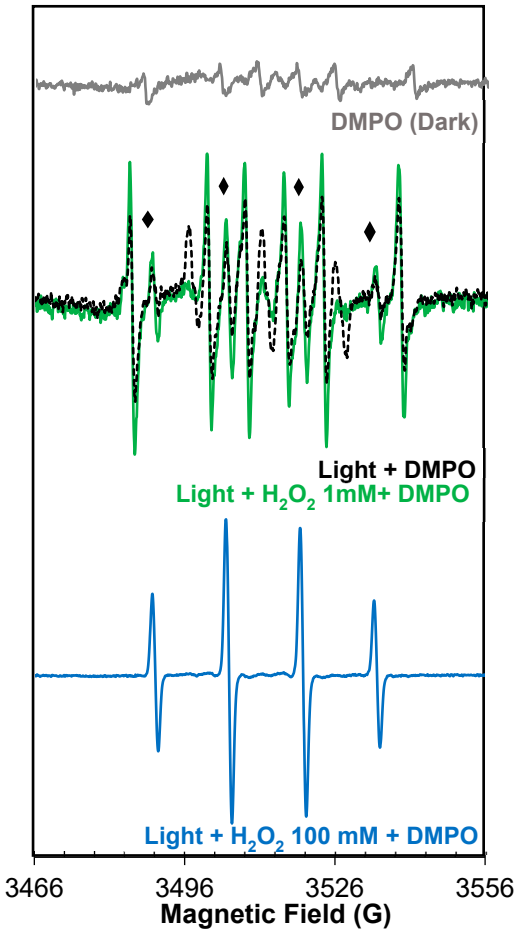


Figure S3. EPR spectrum of radicals captured H_2O_2-Light system by DMPO in water.

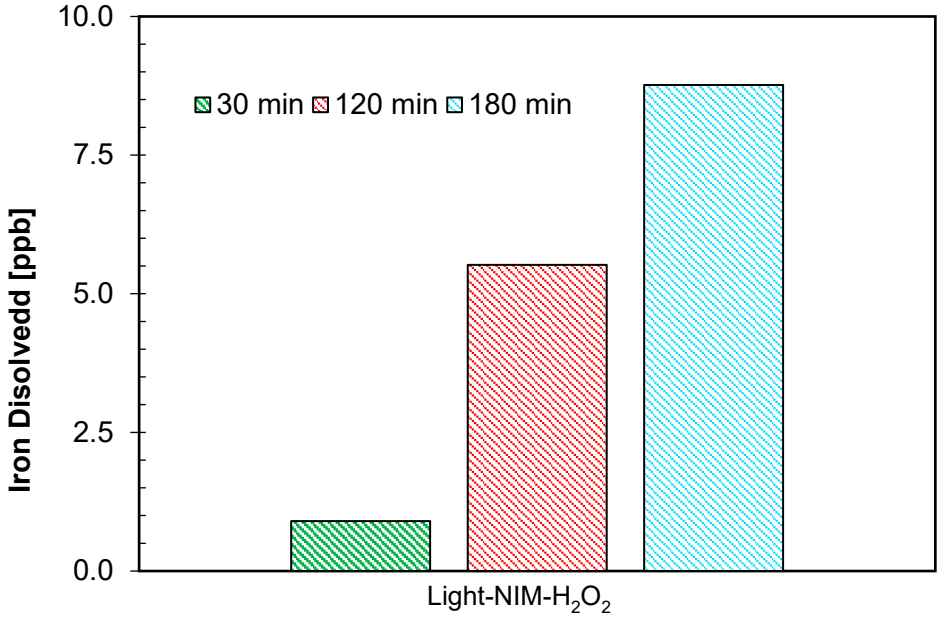
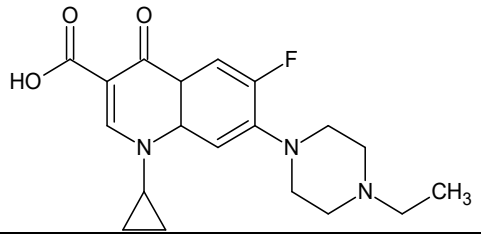
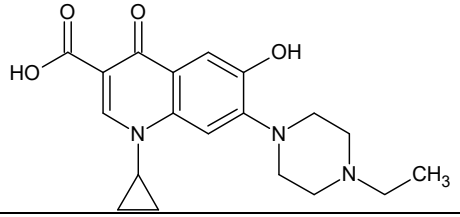
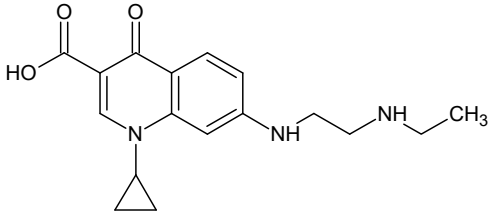
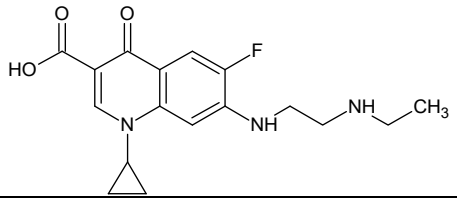
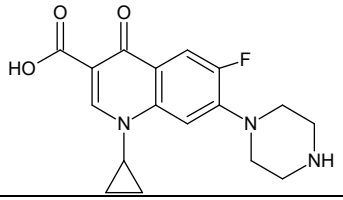
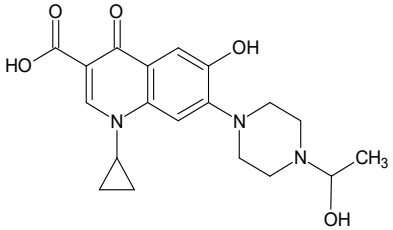
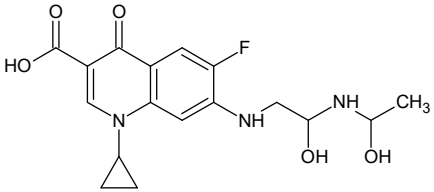


Figure S4. Dissolved iron ions during ENR degradation under Light-NIM-H_2O_2 process

Supplementary Tables

Table S1. Characteristics of the identified by-products of enrofloxacin (ENR).

Compound	Structure Proposed	Chemical Name	$[M+H]^+$	Main Fragments $[M+H]^+$	Also found in refs
ENR		1-cyclopropyl-7-(4-ethylpiperazin-1-yl)-6-fluoro-4-oxo-1,4,4a,8a-tetrahydroquinoline-3-carboxylic acid	[360]		
P1		1-cyclopropyl-7-(4-ethylpiperazin-1-yl)-6-hydroxy-4-oxo-1,4-dihydroquinoline-3-carboxylic acid	[358]	329, 310, 289, 279, 263, 259, 234, 213.	[4][5]
P2		1-cyclopropyl-7-{[2-(ethylamino)ethyl]amino}-4-oxo-1,4-dihydroquinoline-3-carboxylic acid	[316]	279, 258, 229.	[4][5]

Compound	Structure Proposed	Chemical Name	$[M+H]^+$	Main Fragments $[M+H]^+$	Also found By
P3		7-[(2-aminoethyl) (ethyl)amino]-1-cyclopropyl-6-fluoro-4-oxo-1,4-dihydroquinoline-3-carboxylic acid	[334]	320,301, 278,259, 213	[5]
P4 **(CIP)**		1-cyclopropyl-6-fluoro-4-oxo-7-(piperazin-1-yl)-1,4-dihydroquinoline-3-carboxylic acid	[332]	278, 213	[6][7][8]
P5		1-cyclopropyl-6-hydroxy-7-[4-(1-hydroxyethyl)piperazin-1-yl]-4-oxo-1,4-dihydroquinoline-3-carboxylic acid	[374]	375,279, 259, 229, 213	-
P6		1-cyclopropyl-6-fluoro-7-[(hydroxymethyl){2-[(hydroxymethyl)amino]ethyl}amino]-4-oxo-1,4-dihydroquinoline-3-carboxylic acid.	[366]	242, 224, 207, 194, 166	

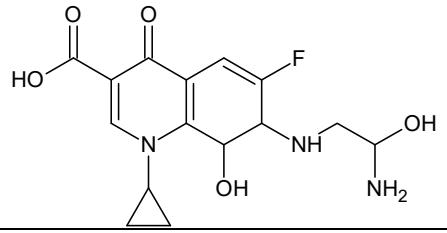
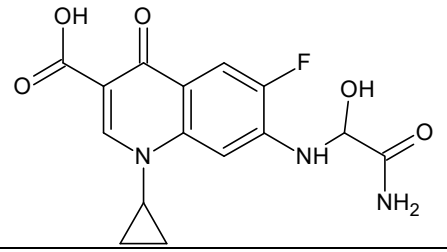
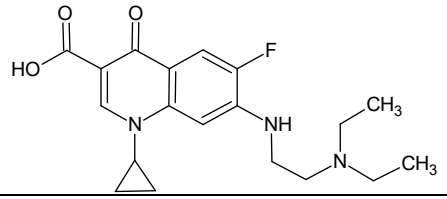
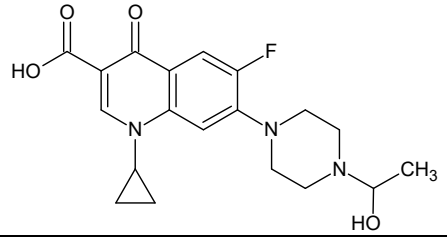
Compound	Structure Proposed	Chemical Name	$[M+H]^+$	Main Fragments $[M+H]^+$	Also found By
P7		7-[(2-amino-1-hydroxy-ethyl)amino]-1-cyclopropyl-6-fluoro-8-hydroxy-4-oxo-1,4,7,8-tet-rahydroquinoline-3-carboxylic acid	[340]	332, 166	
P8		1-cyclopropyl-6-fluoro-8-hydroxy-7-[(2-nitrosoethyl)amino]-4-oxo-1,4-dihydroquinoline-3-carboxylic acid	[336]	332, 352	
P9		1-cyclopropyl-7-{[2-(diethyla-mino)ethyl]amino}-6-fluoro-4-oxo-1,4-dihydroquinoline-3-carboxylic acid	[362]	329,296, 284,279, 241, 213, 204, 167, 117, 114	
P10		1-cyclopropyl-6-fluoro-7-[4-(2-hy-droxyethyl)piperazin-1-yl]-4-oxo-1,4-dihydroquinoline-3-carboxylic acid	[376]	340, 279, 258, 240, 212	

Table S2. Main characteristics of the effluents of municipal wastewater treatment plant (EWWTP).

Property	Unit	Value Sample 2	Analytical method
pH		7.2	(SM 4500 HB) [9]
Conductivity	$\mu S\ cm^{-1}$	2156	27888:1994 Asociación Española de Normalización y Certificación (AENOR) [10]
Chemical oxygen demand (COD)	$mg\ L^{-1}$	62	(EPA 410.4)[11]
Turbidity	TNU	7	7027:2001 (ISO, AENOR, 2001) [12,13]
Total Organic Carbon (TOC)	$mg\ L^{-1}$	32	5310B (Eaton et al., 2005) [14]
Dissolved oxygen	$mg\ L^{-1}$	6.2	Método Winkler, 4500 O-C (Eaton et al., 2005) [14][13]

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