

Supplemental Table 1. Publication year, reference, country where the sample were collected or the study was conducted, and theme of included articles. Ordered in ascending order by publication year and first author

Publication year	Reference	LAC Country^{1,2}	Theme³
1973	Cordano, Virgilio, Escobedo, 1973	Chile	8
1981	Fortune, 1981	Caribbean	8
1986	Baya <i>et al.</i> , 1986	Caribbean	5 and 8
1987	Ribeiro Dias, Vicente, Hofer, 1987	Brazil	6 and 8
1988	Rivera, Hazen, Toranzos, 1988	Caribbean	8
1991	Baldini and Cabezali, 1991	Argentina	8
1992	Montoya <i>et al.</i> , 1992	Chile	5 and 8
1992	Ordúz <i>et al.</i> , 1992	Colombia	8
1993	Bocca, Vermeulen and Wachsman, 1993	Argentina	6 and 8
1993	Perez <i>et al.</i> , 1993	Argentina	8
1994	Martinez, Mondaca and Zemelman, 1994	Chile	8
1995	de Mondino, Nunes and Ricciardi, 1995	Brazil	8
1995	deCortinez <i>et al.</i> , 1995	Argentina	5 and 8
1996	Cordano and Virgilio, 1996	Chile	4, 5, 6 and 8
1996	Pillai, Rubio and Ricke, 1996	Mexico	8
1997	Alippi <i>et al.</i> , 1997	Argentina	4
1997	Carrasco <i>et al.</i> , 1997	Caribbean	5 and 8
1997	De Silva, Mantilla and Agudelo, 1997	Colombia	8
1997	Ohno <i>et al.</i> , 1997	Bolivia	5 and 8
1997	Pillai <i>et al.</i> , 1997	Mexico	8
1997	Teixeira <i>et al.</i> , 1997	Brazil	8
1998	Colaço <i>et al.</i> , 1998	Brazil	8
1998	Falcao, Lustri and Bauab, 1998	Brazil	8
1998	Isaac-Márquez <i>et al.</i> , 1998	Mexico	8
1998	Miranda and Castillo, 1998	Chile	6 and 8
1998	Xavier <i>et al.</i> , 1998	Brazil	4
1999	Cursino <i>et al.</i> , 1999	Brazil	8
2000	das Graças Silva <i>et al.</i> , 2000	Brazil	5 and 8
2001	Benassi <i>et al.</i> , 2001	Argentina	8
2001	Gili <i>et al.</i> , 2001	Argentina	8
2001	Kuzina <i>et al.</i> , 2001	Mexico	7
2002	Miranda and Zemelman, 2002	Chile	1 and 8

2002	Oliveira <i>et al.</i> , 2002	Brazil	1
2003	Ceballos <i>et al.</i> , 2003	Brazil	8
2003	Miranda <i>et al.</i> , 2003	Chile	1, 5 and 8
2003	Roe, Vega and Pillai, 2003	Mexico	5 and 8
2004	Alvarez <i>et al.</i> , 2004	Venezuela	1 and 8
2004	Bidinost <i>et al.</i> , 2004	Argentina	8
2004	Cardonha <i>et al.</i> , 2004	Brazil	6 and 8
2004	Castillo <i>et al.</i> , 2004	Mexico	4 and 8
2004	Falcão <i>et al.</i> , 2004	Brazil	8
2005	Cardonha <i>et al.</i> , 2005	Brazil	6 and 8
2005	Prabakaran <i>et al.</i> , 2005	Argentina	8
2005	Silva <i>et al.</i> , 2005	Chile	8
2006	Garibay <i>et al.</i> , 2006	Mexico	8
2006	De Moura <i>et al.</i> , 2006	Brazil	1
2006	Durán, de Oliveira, de Azevedo, 2006	Brazil	2
2006	Miles, McLaughlin and Brown, 2006	Caribbean	1
2006	Pereira <i>et al.</i> , 2006	Brazil	1, 2 and 8
2006	Prados <i>et al.</i> , 2006	Chile	8
2006	Rodas-Suárez <i>et al.</i> , 2006	Mexico	8
2006	Rodríguez <i>et al.</i> , 2006	Costa Rica	4
2006	Silva <i>et al.</i> , 2006	Chile	5 and 8
2006	Vieira <i>et al.</i> , 2006	Brazil	5 and 8
2007	Abraham <i>et al.</i> , 2007	Brazil	8
2007	Ball <i>et al.</i> , 2007	Venezuela	5, 6 and 8
2007	Dalmázio, Almeida and Augusti, 2007	Brazil	3
2007	Escudero <i>et al.</i> , 2007	Chile	8
2007	Fernandez-Delgado <i>et al.</i> , 2007	Venezuela	8
2007	Ferreira <i>et al.</i> , 2007	Brazil	5
2007	Fraga <i>et al.</i> , 2007	Argentina	8
2007	Lima-Bittencourt <i>et al.</i> , 2007a	Brazil	6 and 8
2007	Lima-Bittencourt <i>et al.</i> , 2007b	Brazil	5, 6 and 8
2007	Miranda and Rojas, 2007	Chile	1 and 8
2007	Pontes <i>et al.</i> , 2007	Brazil	5, 6 and 8
2007	Rodríguez and Zaidi, 2007	Caribbean	8
2008	Baldini and Selzer, 2008	Argentina	8
2008	Costa <i>et al.</i> , 2008	Brazil	1 and 8
2008	Dib <i>et al.</i> , 2008	Argentina	6 and 8
2008	Kharroub <i>et al.</i> , 2008	Chile	8
2008	Martins <i>et al.</i> , 2008	Brazil	3

2008	Newaj-Fyzul, <i>et al.</i> , 2008	Caribbean	1 and 8
2008	Nieto <i>et al.</i> , 2008	Chile	3
2008	da Oliveira and Pinhata, 2008	Brazil	8
2008	Oyarzabal <i>et al.</i> , 2008	Caribbean	1
2008	Prado <i>et al.</i> , 2008	Brazil	3 and 8
2008	Scoaris <i>et al.</i> , 2008	Brazil	8
2008	Siemens, Huschek and Kaupenjohann, 2008	Mexico	3
2008	Silva <i>et al.</i> , 2008	Brazil	8
2009	Balsalobre <i>et al.</i> , 2009	Brazil	5 and 8
2009	Berto <i>et al.</i> , 2009	Brazil	3
2009	López Cuevas <i>et al.</i> , 2009	Mexico	6 and 8
2009	de Carvalho <i>et al.</i> , 2009	Brazil	1 and 8
2009	Dib <i>et al.</i> , 2009	Argentina	8
2009	Escalante <i>et al.</i> , 2009	Chile	5
2009	Fernandez-Delgado and Suarez, 2009	Brazil	8
2009	Fernandez-Delgado <i>et al.</i> , 2009	Venezuela	8
2009	Pontes <i>et al.</i> , 2009	Brazil	5, 6 and 8
2009	Trovó <i>et al.</i> , 2009	Brazil	3
2009	Valenzuela <i>et al.</i> , 2009	Chile	5
2010	Evangelista-Barreto <i>et al.</i> , 2010	Brazil	8
2010	Fernandes Cardoso de Oliveira, Ranzani de França and Pinto, 2010	Brazil	8
2010	Fernandez Alarcon <i>et al.</i> , 2010	Chile	1, 5 and 8
2010	Giraldo <i>et al.</i> , 2010	Colombia	3
2010	Lin <i>et al.</i> , 2010	Mexico	3
2010	Lugo-Melchor <i>et al.</i> , 2010	Mexico	5 and 8
2010	Luiz <i>et al.</i> , 2010	Brazil	3
2010	Patel, Pedersen and Kotelnikova, 2010	Caribbean	8
2010	Pavissich, Silva, Gonzalez, 2010	Chile	5
2010	Ribeiro <i>et al.</i> , 2010	Brazil	1 and 8
2010	Rozas <i>et al.</i> , 2010	Chile	3
2010	Sá <i>et al.</i> , 2010	Brazil	5 and 8
2010	Vieira <i>et al.</i> , 2010	Brazil	1, 5 and 8
2011	Brigante and Schulz, 2011	Argentina	3
2011	Chagas <i>et al.</i> , 2011a	Brazil	5 and 8
2011	Chagas <i>et al.</i> , 2011b	Brazil	3, 5 and 8
2011	Cummings <i>et al.</i> , 2011	Mexico	5
2011	Da Silva <i>et al.</i> , 2011	Brazil	8
2011	Domingos <i>et al.</i> , 2011	Brazil	8

2011	Ferreira <i>et al.</i> , 2011	Brazil	5 and 8
2011	Fontes <i>et al.</i> , 2011	Brazil	5 and 8
2011	Fuentefria, Ferreira and Corção, 2011	Brazil	8
2011	Graham <i>et al.</i> , 2011	Caribbean	5
2011	Lima-Bittencourt <i>et al.</i> , 2011a	Brazil	6 and 8
2011	Lima-Bittencourt <i>et al.</i> , 2011b	Brazil	8
2011	Mondragon <i>et al.</i> , 2011	Mexico	6 and 8
2011	Reboucas <i>et al.</i> , 2011	Brazil	1, 5 and 8
2011	Rojas <i>et al.</i> , 2011	Chile	3
2011	Santamaría, Lopez and Soto, 2011	Colombia	1 and 5
2011	Trovó <i>et al.</i> , 2011	Brazil	3
2012	Amaya <i>et al.</i> , 2012	Caribbean	5 and 8
2012	Barros-Becker <i>et al.</i> , 2012	Chile	2
2012	Buschmann <i>et al.</i> , 2012	Chile	1, 5 and 8
2012	Costa <i>et al.</i> , 2012	Brazil	3
2012	Deschamps <i>et al.</i> , 2012	Brazil	3
2012	Figueiredo <i>et al.</i> , 2012	Brazil	1 and 2
2012	Ilhan, Ong and Moorman, 2012	Mexico	3
2012	Knapp <i>et al.</i> , 2012	Caribbean	5
2012	Lopez <i>et al.</i> , 2012	Chile	1 and 5
2012	Muñoz, <i>et al.</i> , 2012	Venezuela	8
2012	Paes <i>et al.</i> , 2012	Brazil	8
2012	Pallecchi <i>et al.</i> , 2012	Peru	1
2012	Queiroz <i>et al.</i> , 2012	Brazil	3
2012	Resende <i>et al.</i> , 2012	Brazil	1, 6 and 8
2012	Reynoso <i>et al.</i> , 2012	Argentina	3
2012	Salloto <i>et al.</i> , 2012	Brazil	1 and 8
2012	Santoro, Romão and Clementino, 2012	Brazil	8
2012	Spindler <i>et al.</i> , 2012	Brazil	5 and 8
2012	Zanella <i>et al.</i> , 2012	Brazil	1
2013	Besaury <i>et al.</i> , 2013	Chile	5
2013	Brandt <i>et al.</i> , 2013	Brazil	3
2013	Carvalho <i>et al.</i> , 2013	Brazil	8
2013	Castillo-Rojas <i>et al.</i> , 2013	Mexico	8
2013	De Carvalho <i>et al.</i> , 2013	Brazil	8
2013	de Oliveira, Dos and Grisolia, 2013	Brazil	3 and 8
2013	Escudero <i>et al.</i> , 2013	Chile	5
2013	Granados-Chinchilla, Arias-Andrés and Rodriguez, 2013	Costa Rica	2
2013	López-Pérez <i>et al.</i> , 2013	Mexico	5 and 8

2013	Miranda <i>et al.</i> , 2013	Chile	1 and 3
2013	Padilla and Lobos, 2013	Chile	8
2013	Picão <i>et al.</i> , 2013	Brazil	5 and 8
2013	Poblete-Morales <i>et al.</i> , 2013	Chile	1 and 2
2013	Ramírez Castillo <i>et al.</i> , 2013	Mexico	5 and 8
2013	Rodrigues-Silva <i>et al.</i> , 2013	Brazil	3
2013	Santiago-Rodriguez <i>et al.</i> , 2013	Caribbean	5
2013	Stone <i>et al.</i> , 2013	Caribbean	1
2013	Zanetti <i>et al.</i> , 2013	Brazil	5 and 8
2014	Aizawa <i>et al.</i> , 2014	Brazil	1
2014	Arias-Andrés, Mena and Pinnock, 2014	Costa Rica	2
2014	Basso <i>et al.</i> , 2014	Brazil	8
2014	Besaury, Ghiglione and Quillet, 2014	Chile	5
2014	Borghi <i>et al.</i> , 2014	Brazil	3
2014	Carrales-Alvarado <i>et al.</i> , 2014	Mexico	3
2014	Cicuta <i>et al.</i> , 2014	Argentina	1 and 8
2014	Colque Navarro <i>et al.</i> , 2014	Chile	8
2014	Coutinho <i>et al.</i> , 2014	Brazil	5 and 8
2014	De Albuquerque <i>et al.</i> , 2014	Brazil	1
2014	de Souza <i>et al.</i> , 2014a	Brazil	3
2014	de Souza <i>et al.</i> , 2014b	Brazil	8
2014	Ferraz <i>et al.</i> , 2014	Brazil	2
2014	Ganesh <i>et al.</i> , 2014	Chile	5
2014	Gorriti <i>et al.</i> , 2014	Argentina	5
2014	Jank <i>et al.</i> , 2014	Brazil	3
2014	Krzyzanowski <i>et al.</i> , 2014	Brazil	5 and 8
2014	Correa <i>et al.</i> , 2014	Brazil	5 and 8
2014	Martins <i>et al.</i> , 2014	Brazil	5, 6 and 8
2014	Palhares <i>et al.</i> , 2014	Brazil	1
2014	Rebello and Regua-Mangia, 2014	Brazil	8
2014	Vega-Sanchez <i>et al.</i> , 2014	Mexico	1 and 2
2015	Alam <i>et al.</i> , 2015	Caribbean	8
2015	Andueza <i>et al.</i> , 2015	Ecuador	8
2015	Antonin <i>et al.</i> , 2015	Brazil	3
2015	Botelho <i>et al.</i> , 2015	Brazil	2
2015	Curtis <i>et al.</i> , 2015	Brazil	2
2015	da Rocha <i>et al.</i> , 2015	Brazil	8
2015	Fernández, Granados-Chinchilla and Rodríguez, 2015	Costa Rica	3
2015	Gazal <i>et al.</i> , 2015	Brazil	1

2015	Giowanella <i>et al.</i> , 2015	Brazil	8
2015	Guevara-Almaraz <i>et al.</i> , 2015	Mexico	3
2015	Heck <i>et al.</i> , 2015	Brazil	3, 6 and 8
2015	Hussain <i>et al.</i> , 2015	Brazil	3
2015	Mafla <i>et al.</i> , 2015	Chile	3
2015	Magdaleno <i>et al.</i> , 2015	Argentina	2
2015	Miranda <i>et al.</i> , 2015a	Brazil	5 and 8
2015	Miranda <i>et al.</i> , 2015b	Chile	1, 5 and 8
2015	Montezzi <i>et al.</i> , 2015	Brazil	5 and 8
2015	Paiva <i>et al.</i> , 2015	Brazil	3 and 5
2015	Pavan <i>et al.</i> , 2015	Argentina	5 and 6
2015	Peres, Maniero and Guimarães, 2015	Brazil	3
2015	Ponce-Soto <i>et al.</i> , 2015	Mexico	8
2015	Reynoso <i>et al.</i> , 2015	Argentina	3
2015	Rosas <i>et al.</i> , 2015	Mexico	5 and 8
2015	Santoro <i>et al.</i> , 2015	Brazil	8
2015	Santos, Meireles and Lange, 2015	Brazil	3
2015	Sato <i>et al.</i> , 2015	Brazil	1
2015	Somensi <i>et al.</i> , 2015	Brazil	3
2015	Soto <i>et al.</i> , 2015	Mexico	1 and 2
2015	Tomova <i>et al.</i> , 2015	Chile	5
2015	Villegas-Guzman <i>et al.</i> , 2015a	Colombia	3
2015	Villegas-Guzman <i>et al.</i> , 2015b	Colombia	3
2015	Vinuesa and Ochoa-Sánchez, 2015	Mexico	5
2016	Acosta <i>et al.</i> , 2016	Colombia	3
2016	Babaei <i>et al.</i> , 2016	Brazil	3
2016	Baron <i>et al.</i> , 2016	Caribbean	5 and 8
2016	Batista <i>et al.</i> , 2016	Brazil	3
2016	Cabral <i>et al.</i> , 2016	Brazil	5
2016	Canal <i>et al.</i> , 2016	Brazil	5 and 8
2016	Castelo-Branco <i>et al.</i> , 2016	Brazil	1 and 8
2016	Castillo <i>et al.</i> , 2016	Chile	1
2016	Chatila <i>et al.</i> , 2016	Brazil	3
2016	Coledam <i>et al.</i> , 2016	Brazil	3
2016	da Silveira, Sousa and Evangelista-Barreto, 2016	Brazil	8
2016	Delgado-Blas <i>et al.</i> , 2016	Venezuela	1, 5 and 8
2016	Delgado-Gardea <i>et al.</i> , 2016	Mexico	8
2016	Dropa <i>et al.</i> , 2016	Brazil	5 and 8
2016	Estrada-Arriaga <i>et al.</i> , 2016	Mexico	3

2016	Faria <i>et al.</i> , 2016	Brazil	5
2016	Freitas <i>et al.</i> , 2016	Brazil	3
2016	Froes <i>et al.</i> , 2016	Brazil	5
2016	Gutiérrez-Alcántara <i>et al.</i> , 2016	Mexico	4
2016	Lara, Rodríguez and Peñuela, 2016	Colombia	3
2016	Lima <i>et al.</i> , 2016	Brazil	3
2016	Lopes <i>et al.</i> , 2016a	Brazil	8
2016	Lopes <i>et al.</i> , 2016b	Brazil	1
2016	Lopes <i>et al.</i> , 2016c	Brazil	5
2016	Magalhães <i>et al.</i> , 2016	Brazil	8
2016	Maizel <i>et al.</i> , 2015	Argentina	5
2016	Maran <i>et al.</i> , 2016	Brazil	8
2016	Medeiros <i>et al.</i> , 2016	Brazil	5
2016	Melo, Dezotti and Marques, 2016	Brazil	3
2016	Monteiro <i>et al.</i> , 2016	Brazil	1 and 2
2016	Moreira <i>et al.</i> , 2016	Brazil	2
2016	Nuñez <i>et al.</i> , 2016	Argentina	8
2016	Pachiadaki <i>et al.</i> , 2016	Peru	5
2016	Pehrsson <i>et al.</i> , 2016	Peru and El Salvador	5
2016	Perales-Vela <i>et al.</i> , 2016	Mexico	2
2016	Pissetti <i>et al.</i> , 2016	Brazil	1
2016	Poma, Mamani and Iñiguez, 2016	Bolivia	8
2016	Porrás <i>et al.</i> , 2016	Colombia	3
2016	Reis <i>et al.</i> , 2016	Brazil	5
2016	Rocha, Sousa and Vieira, 2016	Brazil	5 and 8
2016	Rozas <i>et al.</i> , 2016	Chile	3
2016	Santos <i>et al.</i> , 2016	Brazil	3
2016	Serna-Galvis <i>et al.</i> , 2016a	Colombia	3
2016	Serna-Galvis <i>et al.</i> , 2016b	Colombia	3
2016	Simões <i>et al.</i> , 2016	Brazil	5
2017	Archundia <i>et al.</i> , 2017	Bolivia	5
2017	Brandao <i>et al.</i> , 2017	Brazil	5 and 8
2017	Briquaire <i>et al.</i> , 2017	Caribbean	8
2017	Caianelo <i>et al.</i> , 2017	Brazil	3
2017	Castelo-Branco <i>et al.</i> , 2017	Brazil	1 and 8
2017	Castro-Severyn <i>et al.</i> , 2017	Chile	5
2017	Chideroli <i>et al.</i> , 2017	Brazil	1 and 2
2017	Conte <i>et al.</i> , 2017	Brazil	5 and 8

2017	Silva, de Lima Perini and Nogueira, 2017	Brazil	3
2017	Menezes <i>et al.</i> , 2017	Brazil	1, 5 and 8
2017	de Oliveira <i>et al.</i> , 2017a	Brazil	3
2017	de Oliveira <i>et al.</i> , 2017b	Brazil	5
2017	Elizalde-Velázquez <i>et al.</i> , 2017	Mexico	2
2017	Fernandes <i>et al.</i> , 2017	Brazil	5 and 8
2017	Fernandez-Delgado <i>et al.</i> , 2017	Caribbean	8
2017	Giraldo-Aguirre <i>et al.</i> , 2017	Colombia	3
2017	Guyomard-Rabenirina <i>et al.</i> , 2017	Caribbean	5 and 8
2017	Jayme <i>et al.</i> , 2017	Brazil	8
2017	Jojoa-Sierra <i>et al.</i> , 2017	Colombia	3
2017	Marcelino <i>et al.</i> , 2017	Brazil	3
2017	Martínez <i>et al.</i> , 2017	Chile	8
2017	Nascimento <i>et al.</i> , 2017	Brazil	5, 6 and 8
2017	Ochoa-Sanchez and Vinuesa, 2017	Mexico	5 and 8
2017	Paiva <i>et al.</i> , 2017	Brazil	5 and 8
2017	Peltzer <i>et al.</i> , 2017	Argentina	2
2017	Perini <i>et al.</i> , 2017	Brazil	3
2017	Robledo Zazarías <i>et al.</i> , 2017	Mexico	3
2017	Saucier <i>et al.</i> , 2017a	Brazil	3
2017	Sellera <i>et al.</i> , 2017	Brazil	5 and 8
2017	Serna-Galvis <i>et al.</i> , 2017a	Colombia	3
2017	Serna-Galvis <i>et al.</i> , 2017b	Colombia	3
2017	Villegas-Guzman <i>et al.</i> , 2017	Colombia	3
2017	Zarza <i>et al.</i> , 2017	Mexico	5

¹ Refer to box 1 for information of countries included in the Caribbean classification

² The country names were shortened in the table due to lack of space. The correct country name for Bolivia is the Plurinational State of Bolivia and for Venezuela is the Bolivarian Republic of Venezuela

³ Themes of interest: (1) Impact of the antibiotic use in the livestock and aquatic production systems as sources of antibiotic resistance in environmental water, (2) Negative or unexpected effects of AMR and antibiotics on terrestrial and aquatic wildlife living organisms, (3) Degradation of AMR in the environment, (4) Impact of the use of antimicrobials in agricultural production, (5) Transmission of antimicrobial resistance genes from both humans and animals through water, (6) Crossed antimicrobial resistance between antibiotics and heavy metals, (7) Emerging pests and diseases with potential impact in the production of AMR, (8) Detection of microorganisms with AMR in water

REFERENCES

REFERENCES ANNEX 2. Summary of the data extracted for the variables publication year, country and theme

- Abraham, W.R., Macedo, A.J., Gomes, L.H., Tavares, F.C.A., 2007. Occurrence and resistance of pathogenic bacteria along the Tietê River downstream of São Paulo in Brazil. *Clean - Soil, Air, Water* 35, 339–347. <https://doi.org/10.1002/clen.200700011>
- Acosta, R., Fierro, V., Martinez de Yuso, A., Nabarlantz, D., Celzard, A., 2016. Tetracycline adsorption onto activated carbons produced by KOH activation of tyre pyrolysis char. *Chemosphere* 149, 168–176. <https://doi.org/10.1016/j.chemosphere.2016.01.093>
- Aizawa, J., Neuwirt, N., Barbato, L., Neves, P.R., Leigue, L., Padilha, J., Pestana de Castro, A.F., Gregory, L., Lincopan, N., 2014. Identification of fluoroquinolone-resistant extended-spectrum beta-lactamase (CTX-M-8)-producing *Escherichia coli* ST224, ST2179 and ST2308 in buffalo (*Bubalus bubalis*). *J. Antimicrob. Chemother.* <https://doi.org/10.1093/jac/dku218>
- Alam, M.T., Weppelmann, T.A., Longini, I., De Rochars, V.M.B., Morris, J.G.J., Ali, A., 2015. Increased isolation frequency of toxigenic *Vibrio cholerae* O1 from environmental monitoring sites in Haiti. *PLoS One* 10, e0124098. <https://doi.org/10.1371/journal.pone.0124098>
- Alippi, A.M., Bó, E.D., Ronco, L.B., Casanova, P.E., Aguilar, O.M., 1997. Tomato as a new host of *Erwinia carotovora* subsp. *Carotovora* in Argentina. *Plant Dis.* 81, 230. <https://doi.org/10.1094/PDIS.1997.81.2.230A>
- Alvarez, J.D., Agurto, C.P., Alvarez, A.M., Obregon, J., 2004. Antimicrobial resistance in bacteria isolated from tilapia, water and sediment samples in Venezuela. *Rev. Cient. la Fac. Ciencias Vet.* 14, 491–499.
- Amaya, E., Reyes, D., Paniagua, M., Calderon, S., Rashid, M.-U., Colque, P., Kuhn, I., Mollby, R., Weintraub, A., Nord, C.E., 2012. Antibiotic resistance patterns of *Escherichia coli* isolates from different aquatic environmental sources in Leon, Nicaragua. *Clin. Microbiol. Infect.* 18, E347-54. <https://doi.org/10.1111/j.1469-0691.2012.03930.x>
- Andueza, F., Albuja, A., Arguelles, P., Escobar, S., Espinoza, C., Araque, J., Medina, G., 2015. Antimicrobial resistance in strains *Pseudomonas aeruginosa* isolated from termal waters at Chimborazo, Ecuador. *An. LA REAL Acad. Nac. Farm.* 81, 158–163.
- Antonin, V.S., Santos, M.C., Garcia-Segura, S., Brillas, E., 2015. Electrochemical incineration of the antibiotic ciprofloxacin in sulfate medium and synthetic urine matrix. *Water Res.* 83, 31–41. <https://doi.org/10.1016/j.watres.2015.05.066>
- Archundia, D., Duwig, C., Lehembre, F., Chiron, S., Morel, M.-C., Prado, B., Bourdat-Deschamps, M., Vince, E., Aviles, G.F., Martins, J.M.F., 2017. Antibiotic pollution in the Katari subcatchment of the Titicaca Lake: Major transformation products and occurrence of resistance genes. *Sci. Total Environ.* 576, 671–682. <https://doi.org/10.1016/j.scitotenv.2016.10.129>
- Arias-Andrés, M., Mena, F., Pinnock, M., 2014. Ecotoxicological evaluation of aquaculture and agriculture sediments with biochemical biomarkers and bioassays: antimicrobial potential exposure. *J. Environ. Biol.* 35, 107–117.

- Babaei, A.A., Lima, E.C., Takdastan, A., Alavi, N., Goudarzi, G., Vosoughi, M., Hassani, G., Shirmardi, M., 2016. Removal of tetracycline antibiotic from contaminated water media by multi-walled carbon nanotubes: operational variables, kinetics, and equilibrium studies. *Water Sci. Technol.* 74, 1202–1216. <https://doi.org/10.2166/wst.2016.301>
- Baldini, M.D., Cabezalí, C.B., 1991. Occurrence of antibiotic-resistant *Escherichia coli* isolated from environmental samples. *Mar. Pollut. Bull.* 22, 500–503. [https://doi.org/10.1016/0025-326X\(91\)90404-G](https://doi.org/10.1016/0025-326X(91)90404-G)
- Baldini, M., Selzer, P., 2008. [Antibiotic resistance patterns of *Enterococci* isolated from estuarine waters]. *Rev. Argent. Microbiol.* 40, 48–51.
- Ball, M.M., Carrero, P., Castro, D., Yarzabal, L.A., 2007. Mercury resistance in bacterial strains isolated from tailing ponds in a gold mining area near El Callao (Bolívar State, Venezuela). *Curr. Microbiol.* 54, 149–154. <https://doi.org/10.1007/s00284-006-0347-4>
- Balsalobre, L.C., Dropa, M., Lincopan, N., Mamizuka, E.M., Matte, G.R., Matte, M.H., 2009. Detection of metallo-beta-lactamases-encoding genes in environmental isolates of *Aeromonas hydrophila* and *Aeromonas jandaei*. *Lett. Appl. Microbiol.* 49, 142–145. <https://doi.org/10.1111/j.1472-765X.2009.02625.x>
- Baron, S., Lesne, J., Jouy, E., Larvor, E., Kempf, I., Boncy, J., Rebaudet, S., Piarroux, R., 2016. Antimicrobial Susceptibility of Autochthonous Aquatic *Vibrio cholerae* in Haiti. *Front. Microbiol.* 7, 1671. <https://doi.org/10.3389/fmicb.2016.01671>
- Barros-Becker, F., Romero, J., Pulgar, A., Feijoo, C.G., 2012. Persistent oxytetracycline exposure induces an inflammatory process that improves regenerative capacity in zebrafish larvae. *PLoS One* 7, e36827. <https://doi.org/10.1371/journal.pone.0036827>
- Basso, A.P., Martins, P.D., Nachtigall, G., Van Der Sand, S., De Moura, T.M., Frazzon, A.P.G., 2014. Antibiotic resistance and enterotoxin genes in *Staphylococcus sp.* isolates from polluted water in Southern Brazil. *An. Acad. Bras. Cienc.* 86, 1813–1820. <https://doi.org/10.1590/0001-3765201420130512>
- Batista, A.P.S., Teixeira, A.C.S.C., Cooper, W.J., Cottrell, B.A., 2016. Correlating the chemical and spectroscopic characteristics of natural organic matter with the photodegradation of sulfamerazine. *Water Res.* 93, 20–29. <https://doi.org/10.1016/j.watres.2015.11.036>
- Baya, A.M., Brayton, P.R., Brown, V.L., Grimes, D.J., Russek-Cohen, E., Colwell, R.R., 1986. Coincident plasmids and antimicrobial resistance in marine bacteria isolated from polluted and unpolluted Atlantic Ocean samples. *Appl. Environ. Microbiol.* 51, 1285–1292.
- Benassi, F.O., Vergara, M., von Specht, M.H., Garcia, M.A., Quiroga, M.I., Pucciarelli, A.B., Zubreski, E., Laczeski, M., Martin, B.M., Leardini, N., Gutkind, G., 2001. [Beta-lactam antibiotic sensitivity in *Aeromonas spp.* of clinical, animal, and environmental origin]. *Rev. Argent. Microbiol.* 33, 47–51.
- Berto, J., Rothenbach, G.C., Barreiros, M.A.B., Correa, A.X.R., Peluso-Silva, S., Radetski, C.M., 2009. Physico-chemical, microbiological and ecotoxicological evaluation of a septic tank/Fenton reaction combination for the treatment of hospital wastewaters. *Ecotoxicol. Environ. Saf.* 72, 1076–1081. <https://doi.org/10.1016/j.ecoenv.2008.12.002>

- Besaury, L., Ghiglione, J.-F., Quillet, L., 2014. Abundance, activity, and diversity of archaeal and bacterial communities in both uncontaminated and highly copper-contaminated marine sediments. *Mar. Biotechnol. (NY)*. 16, 230–242. <https://doi.org/10.1007/s10126-013-9542-z>
- Bidinost, C., Saka, H.A., Aliendro, O., Sola, C., Carranza, P., 2004. Virulence factors of non-O1 non-O139 *Vibrio cholerae* isolated in Córdoba, Argentina 158–163.
- Bocca, S., Vermeulen, E.M., Wachsman, M.B., 1993. [Multiple resistance to heavy metals and antibiotics in bacteria isolated from the Riachuelo]. *Rev. Argent. Microbiol.* 25, 136–143.
- Borghi, A.A., Oliveira-Nascimento, L., Stephano, M.A., de Souza, P.M., Converti, A., Palma, M.S.A., 2014. Cytotoxicity of doxycycline effluent generated by the Fenton process. *Scientific World Journal*. 2014, 439461. <https://doi.org/10.1155/2014/439461>
- Botelho, R.G., Christofoletti, C.A., Correia, J.E., Ansoar, Y., Olinda, R.A., Tornisiello, V.L., 2015. Genotoxic responses of juvenile tilapia (*Oreochromis niloticus*) exposed to florfenicol and oxytetracycline. *Chemosphere* 132, 206–212. <https://doi.org/10.1016/j.chemosphere.2015.02.053>
- Brandao, M.A. da R., Lopes, A.T.S., Neta, M.T. da S., de Oliveira, R.B.F., Rezende, R.P., Albuquerque, G.R., Goncalves, V.D., Rodrigues, D.D.P., Boehs, G., Maciel, B.M., 2017. Microbiological Quality and Prevalence of beta-Lactam Antibiotic Resistance Genes in Oysters (*Crassostrea rhizophorae*). *J. Food Prot.* 80, 488–496. <https://doi.org/10.4315/0362-028X.JFP-16-098>
- Brandt, E.M.F., de Queiroz, F.B., Afonso, R.J.C.F., Aquino, S.F., Chernicharo, C.A.L., 2013. Behaviour of pharmaceuticals and endocrine disrupting chemicals in simplified sewage treatment systems. *J. Environ. Manage.* 128, 718–726. <https://doi.org/10.1016/j.jenvman.2013.06.003>
- Brigante, M., Schulz, P.C., 2011. Remotion of the antibiotic tetracycline by titania and titania-silica composed materials. *J. Hazard. Mater.* 192, 1597–1608. <https://doi.org/10.1016/j.jhazmat.2011.06.082>
- Briquaire, R., Colwell, R.R., Boncy, J., Rossignol, E., Dardy, A., Pandini, I., Villeval, F., Machuron, J.-L., Huq, A., Rashed, S., Vandeveld, T., Rozand, C., 2017. Application of a paper based device containing a new culture medium to detect *Vibrio cholerae* in water samples collected in Haiti. *J. Microbiol. Methods* 133, 23–31. <https://doi.org/10.1016/j.mimet.2016.12.014>
- Buschmann, A.H., Tomova, A., Lopez, A., Maldonado, M.A., Henriquez, L.A., Ivanova, L., Moy, F., Godfrey, H.P., Cabello, F.C., 2012. Salmon aquaculture and antimicrobial resistance in the marine environment. *PLoS One* 7, e42724. <https://doi.org/10.1371/journal.pone.0042724>
- Cabral, L., Junior, G.V.L., Pereira de Sousa, S.T., Dias, A.C.F., Lira Cadete, L., Andreote, F.D., Hess, M., de Oliveira, V.M., 2016. Anthropogenic impact on mangrove sediments triggers differential responses in the heavy metals and antibiotic resistomes of microbial communities. *Environ. Pollut.* 216, 460–469. <https://doi.org/10.1016/j.envpol.2016.05.078>
- Caianelo, M., Rodrigues-Silva, C., Maniero, M.G., Guimaraes, J.R., 2017. Antimicrobial activity against Gram-positive and Gram-negative bacteria during gatifloxacin degradation by hydroxyl radicals. *Environ. Sci. Pollut. Res. Int.* 24, 6288–6298. <https://doi.org/10.1007/s11356-016-6972-y>

- Canal, N., Meneghetti, K.L., de Almeida, C.P., da Rosa Bastos, M., Otton, L.M., Corcao, G., 2016. Characterization of the variable region in the class 1 integron of antimicrobial-resistant *Escherichia coli* isolated from surface water. *Braz. J. Microbiol.* 47, 337–344. <https://doi.org/10.1016/j.bjm.2016.01.015>
- Cardonha, A.M.S., Vieira, R.H.S.F., Rodrigues, D.P., Macrae, A., Peirano, G., Teophilo, G.N.D., 2004. Fecal pollution in water from storm sewers and adjacent seashores in Natal, Rio Grande do Norte, Brazil. *Int. Microbiol.* 7, 213–218.
- Cardonha, A.M.S., Vieira, R.H.S. dos F., Peirano, G., Rodrigues, D. dos P., 2005. [Resistance to antibiotics and heavy metals from *Escherichia coli* isolated from sea water and pluvial galleries]. *Acta Cir. Bras.* 20 Suppl 1, 253–256.
- Carrales-Alvarado, D.H., Ocampo-Perez, R., Leyva-Ramos, R., Rivera-Utrilla, J., 2014. Removal of the antibiotic metronidazole by adsorption on various carbon materials from aqueous phase. *J. Colloid Interface Sci.* 436, 276–285. <https://doi.org/10.1016/j.jcis.2014.08.023>
- Carrasco, C.E., Alvarez, H.J., Ortiz, N., Bisbal, M., Arias, W., Santo Domingo, J.W., Hazem, T.C., 1997. Multiple antibiotic resistant *Escherichia coli* from a tropical rain forest stream in Puerto Rico. *Caribb. J. Sci.* 33, 191–197.
- Carvalho, F.C.T., Sousa, O. V., Carvalho, E.M.R., Hofer, E., Vieira, R.H.S.F., 2013. Antibiotic Resistance of *Salmonella spp.* Isolated from Shrimp Farming Freshwater Environment in Northeast Region of Brazil. *J. Pathog.* 2013, 685193. <https://doi.org/10.1155/2013/685193>
- Castelo-Branco, D. de S.C.M., Sales, J.A., Brilhante, R.S.N., Guedes, G.M. de M., Ponte, Y.B. de, Sampaio, C.M. de S., Bandeira, T. de J.P.G., Moreira, J.L.B., Alencar, L.P. de, Paiva, M. de A.N., Cordeiro, R. de A., Monteiro, A.J., Pereira-Neto, W. de A., Sidrim, J.J.C., Rocha, M.F.G., 2016. Enterobacteria and *Vibrio* from Macrobrachium amazonicum prawn farming in Fortaleza, Ceara, Brazil. *Asian Pac. J. Trop. Med.* 9, 27–31. <https://doi.org/10.1016/j.apjtm.2015.12.006>
- Castelo-Branco, D.S.C.M., Silva, A.L. da, Monteiro, F.O.B., Guedes, G.M. de M., Sales, J.A., Oliveira, J.S. de, Maia Junior, J.E., Miranda, S.A., Sidrim, J.J.C., Alencar, L.P. de, Brilhante, R.S.N., Cordeiro, R. de A., Bandeira, T. de J.P.G., Pereira Neto, W. de A., Rocha, M.F.G., 2017. *Aeromonas* and *Plesiomonas* species from scarlet ibis (*Eudocimus ruber*) and their environment: monitoring antimicrobial susceptibility and virulence. *Antonie Van Leeuwenhoek* 110, 33–43. <https://doi.org/10.1007/s10482-016-0771-9>
- Castillo, A., Mercado, I., Lucia, L.M., Martinez-Ruiz, Y., Ponce de Leon, J., Murano, E.A., Acuff, G.R., 2004. *Salmonella* contamination during production of cantaloupe: a binational study. *J. Food Prot.* 67, 713–720.
- Castillo, D., Christiansen, R.H., Dalsgaard, I., Madsen, L., Espejo, R., Middelboe, M., 2016. Comparative Genome Analysis Provides Insights into the Pathogenicity of *Flavobacterium psychrophilum*. *PLoS One* 11, e0152515. <https://doi.org/10.1371/journal.pone.0152515>
- Castillo-Rojas, G., Mazari-Hiriart, M., Ponce de Leon, S., Amieva-Fernandez, R.I., Agis-Juarez, R.A., Huebner, J., Lopez-Vidal, Y., 2013. Comparison of *Enterococcus faecium* and *Enterococcus faecalis* Strains isolated from water and clinical samples: antimicrobial susceptibility and genetic relationships. *PLoS One* 8, e59491. <https://doi.org/10.1371/journal.pone.0059491>

- Castro-Severyn, J., Remonsellez, F., Valenzuela, S.L., Salinas, C., Fortt, J., Aguilar, P., Pardo-Este, C., Dorador, C., Quatrini, R., Molina, F., Aguayo, D., Castro-Nallar, E., Saavedra, C.P., 2017. Comparative Genomics Analysis of a New *Exiguobacterium* Strain from Salar de Huasco Reveals a Repertoire of Stress-Related Genes and Arsenic Resistance. *Front. Microbiol.* 8, 456. <https://doi.org/10.3389/fmicb.2017.00456>
- Ceballos, B.S.O., Soares, N.E., Moraes, M.R., Catao, R.M.R., Konig, A., 2003. Microbiological aspects of an urban river used for unrestricted irrigation in the semi-arid region of north-east Brazil. *Water Sci. Technol.* 47, 51–57.
- Chagas, T.P.G., Seki, L.M., Cury, J.C., Oliveira, J.A.L., Davila, A.M.R., Silva, D.M., Asensi, M.D., 2011b. Multiresistance, beta-lactamase-encoding genes and bacterial diversity in hospital wastewater in Rio de Janeiro, Brazil. *J. Appl. Microbiol.* 111, 572–581. <https://doi.org/10.1111/j.1365-2672.2011.05072.x>
- Chagas, T.P.G., Seki, L.M., da Silva, D.M., Asensi, M.D., 2011a. Occurrence of KPC-2-producing *Klebsiella pneumoniae* strains in hospital wastewater. *J. Hosp. Infect.* <https://doi.org/10.1016/j.jhin.2010.10.008>
- Chatila, S., Amparo, M.R., Carvalho, L.S., Penteado, E.D., Tomita, I.N., Santos-Neto, A.J., Lima Gomes, P.C.F., Zaiat, M., 2016. Sulfamethoxazole and ciprofloxacin removal using a horizontal-flow anaerobic immobilized biomass reactor. *Environ. Technol.* 37, 847–853. <https://doi.org/10.1080/09593330.2015.1088072>
- Chideroli, R.T., Amoroso, N., Mainardi, R.M., Suphoronski, S.A., Padua, S.B., Alfieri, A.F., Alfieri, A.A., Mosela, M., Moralez, A.T.P., Oliveira, A.G., Zanolo, R., Santis, G.W., Pereira, U.P., 2017. Emergence of a new multidrug-resistant and highly virulent serotype of *Streptococcus agalactiae* in fish farms from Brazil. *Aquaculture* 479, 45–51. <https://doi.org/10.1016/j.aquaculture.2017.05.013>
- Cicuta, M.E., Roibón, W.R., Barceló, M.C., Arzú, O.R., Amable, V.I., 2014. Beta-lactam resistance in *Enterobacteria* isolated from animal and water. *Rev. Vet.* 25, 3–6.
- Colaço, W., Silva Filho, S. V, Rodrigues, P., Hofer, E., 1998. [Isolation of *Vibrio cholerae* O1 from aquatic environments and foods in Pernambuco State, Brazil]. *Cad. Saude Publica* 14, 465–471.
- Coledam, D.A.C., Pupo, M.M.S., Silva, B.F., Silva, A.J., Eguiluz, K.I.B., Salazar-Banda, G.R., Aquino, J.M., 2016. Electrochemical mineralization of cephalixin using a conductive diamond anode: A mechanistic and toxicity investigation. *Chemosphere* 168, 638–647. <https://doi.org/10.1016/j.chemosphere.2016.11.013>
- Colque Navarro, P., Fernandez, H., Mollby, R., Otth, L., Tiodolf, M., Wilson, M., Kuhn, I., 2014. Antibiotic resistance in environmental *Escherichia coli* - a simple screening method for simultaneous typing and resistance determination. *J. Water Health* 12, 692–701. <https://doi.org/10.2166/wh.2014.216>
- Conte, D., Palmeiro, J.K., da Silva Nogueira, K., de Lima, T.M.R., Cardoso, M.A., Pontarolo, R., Degaut Pontes, F.L., Dalla-Costa, L.M., 2017. Characterization of CTX-M enzymes, quinolone resistance determinants, and antimicrobial residues from hospital sewage, wastewater treatment plant, and river water. *Ecotoxicol. Environ. Saf.* 136, 62–69. <https://doi.org/10.1016/j.ecoenv.2016.10.031>
- Cordano, A.M., Virgilio, R., 1996. Evolution of drug resistance in *Salmonella panama* isolates in Chile. *Antimicrob. Agents Chemother.* 40, 336–341.

Cordano, A.M., Virgilio, R., Escobedo, M.E., 1973. [Group E *Salmonella* isolated in Chile]. Rev. Latinoam. Microbiol. 15, 1–4.

Correa, F.E.L., Dantas, F.G. da S., Grisolia, A.B., Crispim, B. do A., Oliveira, K.M.P., 2014. Identification of class 1 and 2 integrons from clinical and environmental *Salmonella* isolates. J. Infect. Dev. Ctries. 8, 1518–1524.

Silva, B.C. e., de Lima Perini, J.A., Nogueira, R.F.P., 2017. Influence of dihydroxybenzenes on paracetamol and ciprofloxacin degradation and iron(III) reduction in Fenton processes. Environ. Sci. Pollut. Res. Int. 24, 6157–6164. <https://doi.org/10.1007/s11356-016-6402-1>

Costa, R.A., 2012. Effect of seawater on the activity of antibiotics against *Vibrios* isolated from the hemolymph of cultured pacific white shrimp. J. World Aquac. Soc. 5, 727–732. <https://doi.org/10.1111/j.1749-7345.2012.00590.x>

Costa, R.A., Veira, G.H.F., Silva, G.C., Vieira, R.H.S.F., Sampaio, S.S., 2008. In vitro antimicrobial susceptibility of *Vibrio spp.* isolated from shrimp (*Litopenaeus vannamei*) and water from ponds of a shrimp farm in ceará. Brazilian J. Vet. Res. Anim. Sci. 45, 458–462.

Coutinho, F.H., Silveira, C.B., Pinto, L.H., Salloto, G.R.B., Cardoso, A.M., Martins, O.B., Vieira, R.P., Clementino, M.M., 2014. Antibiotic resistance is widespread in urban aquatic environments of Rio de Janeiro, Brazil. Microb. Ecol. 68, 441–452. <https://doi.org/10.1007/s00248-014-0422-5>

Cummings, D.E., Archer, K.F., Arriola, D.J., Baker, P.A., Faucett, K.G., Laroya, J.B., Pfeil, K.L., Ryan, C.R., Ryan, K.R.U., Zuill, D.E., 2011. Broad dissemination of plasmid-mediated quinolone resistance genes in sediments of two urban coastal wetlands. Environ. Sci. Technol. 45, 447–454. <https://doi.org/10.1021/es1029206>

Cursino, L., Cecílio, R. V, Chartone-Souza, E., Nascimento, A.M.A., 1999. Mercury concentration in the sediment at different gold prospecting sites along the Carmo stream, Minas Gerais, Brazil, and frequency of resistant bacteria in the respective aquatic communities. Hydrobiologia 394, 5–12. <https://doi.org/10.1023/A:1003541512505>

Curtis, Z., Matzen, K., Neira Oviedo, M., Nimmo, D., Gray, P., Winskill, P., Locatelli, M.A.F., Jardim, W.F., Warner, S., Alphey, L., Beech, C., 2015. Assessment of the Impact of Potential Tetracycline Exposure on the Phenotype of *Aedes aegypti* OX513A: Implications for Field Use. PLoS Negl. Trop. Dis. 9, e0003999. <https://doi.org/10.1371/journal.pntd.0003999>

da Rocha, M.P., Dourado, P.L.R., de Souza Rodrigues, M., Raposo, J.L.J., Grisolia, A.B., de Oliveira, K.M.P., 2015. The influence of industrial and agricultural waste on water quality in the Agua Boa stream (Dourados, Mato Grosso do Sul, Brazil). Environ. Monit. Assess. 187, 442. <https://doi.org/10.1007/s10661-015-4475-9>

da Silva, T.F.B.X., Ramos, D.T., Dziedzic, M., de Oliveira, C.M.R., de Vasconcelos, E.C., 2011. Microbiological quality and antibiotic resistance analysis of a Brazilian water supply source. Water, Air, Soil Pollut. 218, 611–618. <https://doi.org/10.1007/s11270-010-0672-x>

- da Silveira, C.S., Sousa, O. V, Evangelista-Barreto, N.S., 2016. Propagation of antimicrobial resistant *Salmonella spp.* In bivalve mollusks from estuary areas of Bahia, Brazil. Rev. Caatinga 29, 450–457. <https://doi.org/10.1590/1983-21252016v29n222rc>
- Dalmázio, I., Almeida, M.O., Augusti, R., Alves, T.M.A., 2007. Monitoring the degradation of tetracycline by ozone in aqueous medium via atmospheric pressure ionization mass spectrometry. J. Am. Soc. Mass Spectrom. 18, 679–687. <https://doi.org/10.1016/j.jasms.2006.12.001>
- das Graças Silva E Souza, W., Avelar, K.E., Antunes, L.C., Lobo, L.A., Domingues, R.M., de Souza Ferreira, M.C., 2000. Resistance profile of *Bacteroides fragilis* isolated in Brazil. Do they shelter the *cfiA* gene? J. Antimicrob. Chemother. 45, 475–481.
- de Albuquerque, A.H., Maciel, W.C., Lopes, E.S., Teixeira, R.S.C., Salles, R.P.R., Machado, D.N., Bezerra, W.G.A., Vasconcelos, R.H., Mendonça, S. V, Carbó, C.B., 2014. Presence of *Salmonella spp.* in One-day-old Chicks from Hatcheries in the Metropolitan Region of Fortaleza, Brazil. Acta Sci. Vet. 42, 1–7.
- de Carvalho Girao, V.B., Martins, N., Cacci, L.C., Coelho-Souza, T., Nouer, S.A., Riley, L.W., Moreira, B.M., 2013. Dissemination of *Acinetobacter nosocomialis* clone among critically ill patients and the environment. J. Clin. Microbiol. 51, 2707–2709. <https://doi.org/10.1128/JCM.00915-13>
- de Carvalho, F.C.T., Barreto, N.S.E., dos Reis, C.M.F., Hofer, E., dos Fernandes Veira, R.H.S., 2009. Antimicrobial susceptibility of *Salmonella* isolated from shrimp farms in Ceará State, Brazil. Rev. Cienc. Agron. 40, 549–556.
- de Mondino, S.S., Nunes, M.P., Ricciardi, I.D., 1995. Occurrence of *Plesiomonas shigelloides* in water environments of Rio de Janeiro city. Mem. Inst. Oswaldo Cruz 90, 1–4.
- De Moura Oliveira, K.A., Mendonça, R.C.S., De Oliveira, G.V., Sodré, A.F., 2006. Antibiotic resistance of *Campylobacter* isolated from automated broiler farms. J. Food Saf. 26, 82–91. <https://doi.org/10.1111/j.1745-4565.2005.00030.x>
- de Oliveira, A.M.D., Maniero, M.G., Rodrigues-Silva, C., Guimaraes, J.R., 2017a. Antimicrobial activity and acute toxicity of ozonated lomefloxacin solution. Environ. Sci. Pollut. Res. Int. 24, 6252–6260. <https://doi.org/10.1007/s11356-016-8319-0>
- de Oliveira, A.J.F.C., Pinhata, J.M.W., 2008. Antimicrobial resistance and species composition of *Enterococcus spp.* isolated from waters and sands of marine recreational beaches in Southeastern Brazil. Water Res. 42, 2242–2250. <https://doi.org/10.1016/j.watres.2007.12.002>
- de Oliveira, D. V, Nunes, L.S., Barth, A.L., Van Der Sand, S.T., 2017b. Genetic Background of beta-Lactamases in *Enterobacteriaceae* Isolates from Environmental Samples. Microb. Ecol. 74, 599–607. <https://doi.org/10.1007/s00248-017-0970-6>
- de Oliveira, K.M.P., dos S Julio, P.D., Grisolia, A.B., 2013. Antimicrobial susceptibility profile of *Pseudomonas spp.* isolated from a swine slaughterhouse in Dourados, Mato Grosso do Sul State, Brazil. Rev. Argent. Microbiol. 45, 57–60.
- De Silva, E.M., Mantilla, J.R., Agudelo, C.A.C., 1997. *Vibrio cholerae* non-O1 in Colombia. Water Res. 31, 3175–3177. [https://doi.org/10.1016/S0043-1354\(97\)00153-X](https://doi.org/10.1016/S0043-1354(97)00153-X)

- de Souza Santos, L.V., Teixeira, D.C., Jacob, R.S., Amaral, M.C.S. do, Lange, L.C., 2014. Evaluation of the aerobic and anaerobic biodegradability of the antibiotic norfloxacin. *Water Sci. Technol.* 70, 265–271. <https://doi.org/10.2166/wst.2014.214>
- de Souza, M., Pinto, F.G.S., Fruet, T.K., Piana, P.A., de Moura, A.C., 2014. Water quality indicators for environmental and resistance profile of *Escherichia coli* strains isolated in Rio Cascavel, Paraná, Brazil. *Eng. Agrícola* 34, 352–362.
- DeCortinez, I.J.M., Velasquez, L.D., Escudero, M.E., Caffer, M.I., Cobo, M.F., DeGuzman, A.M.S., 1995. *Salmonella* serotypes from surface waters in San Luis, Argentina. *Rev. Microbiol.* 26, 180–185.
- Delgado-Blas, J.F., Ovejero, C.M., Abadia-Patino, L., Gonzalez-Zorn, B., 2016. Coexistence of mcr-1 and blaNDM-1 in *Escherichia coli* from Venezuela. *Antimicrob. Agents Chemother.* 60, 6356–6358. <https://doi.org/10.1128/AAC.01319-16>
- Delgado-Gardea, M.C.E., Tamez-Guerra, P., Gomez-Flores, R., Zavala-Diaz de la Serna, F.J., Eroza-de la Vega, G., Nevarez-Moorillon, G.V., Perez-Recoder, M.C., Sanchez-Ramirez, B., Gonzalez-Horta, M.D.C., Infante-Ramirez, R., 2016. Multidrug-Resistant Bacteria Isolated from Surface Water in Bassaseachic Falls National Park, Mexico. *Int. J. Environ. Res. Public Health* 13. <https://doi.org/10.3390/ijerph13060597>
- Deschamps, E., Vasconcelos, O., Lange, L., Donnici, C.L., da Silva, M.C., Sales, J.A., 2012. Management of effluents and waste from pharmaceutical industry in Minas Gerais, Brazil. *Brazilian J. Pharm. Sci.* 48, 727–736. <https://doi.org/10.1590/S1984-82502012000400017>
- Dib, J.R., Weiss, A., Neumann, A., Ordonez, O., Estevez, M.C., Farias, M.E., 2009. Isolation of bacteria from remote high altitude Andean lakes able to grow in the presence of antibiotics. *Recent Pat. Antiinfect. Drug Discov.* 4, 66–76.
- Dib, J., Motok, J., Zenoff, V.F., Ordonez, O., Farias, M.E., 2008. Occurrence of resistance to antibiotics, UV-B, and arsenic in bacteria isolated from extreme environments in high-altitude (above 4400 m) Andean wetlands. *Curr. Microbiol.* 56, 510–517. <https://doi.org/10.1007/s00284-008-9103-2>
- Domingos, M.O., Franzolin, M.R., dos Anjos, M.T., Franzolin, T.M.P., Barbosa Albes, R.C., de Andrade, G.R., Lopes, R.J.L., Barbaro, K.C., 2011. The influence of environmental bacteria in freshwater stingray wound-healing. *Toxicon* 58, 147–153. <https://doi.org/10.1016/j.toxicon.2011.04.016>
- Dropa, M., Lincopan, N., Balsalobre, L.C., Oliveira, D.E., Moura, R.A., Fernandes, M.R., da Silva, Q.M., Matte, G.R., Sato, M.I.Z., Matte, M.H., 2016. Genetic background of novel sequence types of CTX-M-8- and CTX-M-15-producing *Escherichia coli* and *Klebsiella pneumoniae* from public wastewater treatment plants in Sao Paulo, Brazil. *Environ. Sci. Pollut. Res. Int.* 23, 4953–4958. <https://doi.org/10.1007/s11356-016-6079-5>
- Durán, N., De Oliveira, A.F., De Azevedo, M.M.M., 2006. In vitro studies on the release of isoniazid incorporated in poly (epsilon-caprolactone). *J. Chemother.* 18, 473–479. <https://doi.org/10.1179/joc.2006.18.5.473>
- Elizalde-Velázquez, A., Martinez-Rodriguez, H., Galar-Martinez, M., Dublan-Garcia, O., Islas-Flores, H., Rodriguez-Flores, J., Castaneda-Penalvo, G., Lizcano-Sanz, I., Gomez-Olivan, L.M., 2017. Effect of

amoxicillin exposure on brain, gill, liver, and kidney of common carp (*Cyprinus carpio*): The role of amoxicilloic acid. *Environ. Toxicol.* 32, 1102–1120. <https://doi.org/10.1002/tox.22307>

Escalante, G., Campos, V.L., Valenzuela, C., Yanez, J., Zaror, C., Mondaca, M.A., 2009. Arsenic resistant bacteria isolated from arsenic contaminated river in the Atacama Desert (Chile). *Bull. Environ. Contam. Toxicol.* 83, 657–661. <https://doi.org/10.1007/s00128-009-9868-4>

Escudero, L., Chong, G., Demergasso, C., Fárias, M.E., Cabrol, N.A., Grin, E., Minkley Junior, E., Yu, Y., 2007. Investigating microbial diversity and UV radiation impact at the high-altitude lake aguas calientes, Chile. *Proc. SPIE - Int. Soc. Opt. Eng.* 6694, 66940Z. <https://doi.org/10.1117/12.736970>

Escudero, L. V, Casamayor, E.O., Chong, G., Pedros-Alio, C., Demergasso, C., 2013. Distribution of microbial arsenic reduction, oxidation and extrusion genes along a wide range of environmental arsenic concentrations. *PLoS One* 8, e78890. <https://doi.org/10.1371/journal.pone.0078890>

Estrada-Arriaga, E.B., Cortes-Munoz, J.E., Gonzalez-Herrera, A., Calderon-Molgara, C.G., de Lourdes Rivera-Huerta, M., Ramirez-Camperos, E., Montellano-Palacios, L., Gelover-Santiago, S.L., Perez-Castrejon, S., Cardoso-Vigueros, L., Martin-Dominguez, A., Garcia-Sanchez, L., 2016. Assessment of full-scale biological nutrient removal systems upgraded with physico-chemical processes for the removal of emerging pollutants present in wastewaters from Mexico. *Sci. Total Environ.* 571, 1172–1182. <https://doi.org/10.1016/j.scitotenv.2016.07.118>

Evangelista-Barreto, N.S., Teles de Carvalho, F.C., dos Fernandes Vieira, R.H.S., dos Reis, C.M.F., Macrae, A., Rodrigues, D.D.R., 2010. Characterization of *Aeromonas* species isolated from an estuarine environment. *Brazilian J. Microbiol.* 41, 452–460.

Falcão, J.P., Brocchi, M., Proenca-Modena, J.L., Acrani, G.O., Correa, E.F., Falcao, D.P., 2004. Virulence characteristics and epidemiology of *Yersinia enterocolitica* and *Yersiniae* other than *Y. pseudotuberculosis* and *Y. pestis* isolated from water and sewage. *J. Appl. Microbiol.* 96, 1230–1236. <https://doi.org/10.1111/j.1365-2672.2004.02268.x>

Faria, A.C.S., Godoy, I., A, S.A.A., Iglesias, G.A., Candido, S.L., Paz, R.C.R., Nakazato, L., Dutra, V., 2016. Detection of resistance genes and evaluation of water quality at zoo lakes in Brazil. *Cienc. Rural* 46, 860–866. <https://doi.org/10.1590/0103-8478cr20150827>

Fernandes Cardoso de Oliveira, A.J., Ranzani de Franca, P.T., Pinto, A.B., 2010. Antimicrobial resistance of heterotrophic marine bacteria isolated from seawater and sands of recreational beaches with different organic pollution levels in southeastern Brazil: evidences of resistance dissemination. *Environ. Monit. Assess.* 169, 375–384. <https://doi.org/10.1007/s10661-009-1180-6>

Fernandes, M.R., Sellera, F.P., Esposito, F., Sabino, C.P., Cerdeira, L., Lincopan, N., 2017. Colistin-Resistant mcr-1-Positive *Escherichia coli* on Public Beaches, an Infectious Threat Emerging in Recreational Waters. *Antimicrob. Agents Chemother.* 61. <https://doi.org/10.1128/AAC.00234-17>

Fernández, M.L., Granados-Chinchilla, F., Rodríguez, C., 2015. A single exposure of sediment sulphate-reducing bacteria to oxytetracycline concentrations relevant to aquaculture enduringly disturbed their activity, abundance and community structure. *J. Appl. Microbiol.* 119, 354–364. <https://doi.org/10.1111/jam.12846>

- Fernandez-Alarcon, C., Miranda, C.D., Singer, R.S., Lopez, Y., Rojas, R., Bello, H., Dominguez, M., Gonzalez-Rocha, G., 2010. Detection of the floR gene in a diversity of florfenicol resistant Gram-negative bacilli from freshwater salmon farms in Chile. *Zoonoses Public Health* 57, 181–188. <https://doi.org/10.1111/j.1863-2378.2009.01243.x>
- Fernandez-Delgado, M., Suarez, P., 2009. Multiple antibiotic resistances of enteric bacteria isolated from recreational coastal waters and oysters of the Caribbean Sea. *Ann. Microbiol.* 59, 409–414.
- Fernandez-Delgado, M., Contreras, M., Garcia-Amado, M.A., Gueneau, P., Suarez, P., 2007. Occurrence of *Proteus mirabilis* associated with two species of Venezuelan oysters. *Rev. Inst. Med. Trop. Sao Paulo* 49, 355–359.
- Fernandez-Delgado, M., Garcia-Amado, M.A., Contreras, M., Edgcomb, V., Vitelli, J., Gueneau, P., Suarez, P., 2009. *Vibrio cholerae* non-O1, non-O139 associated with seawater and plankton from coastal marine areas of the Caribbean Sea. *Int. J. Environ. Health Res.* 19, 279–289. <https://doi.org/10.1080/09603120802460368>
- Fernandez-Delgado, M., Suarez, P., Giner, S., Sanz, V., Pena, J., Sanchez, D., Garcia-Amado, M.A., 2017. Occurrence and virulence properties of *Vibrio* and *Salinivibrio* isolates from tropical lagoons of the southern Caribbean Sea. *Antonie Van Leeuwenhoek* 110, 833–841. <https://doi.org/10.1007/s10482-017-0856-0>
- Ferraz, A.C.P., Dallavecchia, D.L., da Silva, D.C., de Carvalho, R.P., da Silva Filho, R.G., Aguiar-Coelho, V.M., 2014. Evaluation of the influence of the antibiotic ciprofloxacin in the development of an Old World screwworm fly, *Chrysomya putoria*. *J. Insect Sci.* 14, 3. <https://doi.org/10.1093/jis/14.1.3>
- Ferreira, A.E., Marchetti, D.P., De Oliveira, L.M., Gusatti, C.S., Fuentefria, D.B., Corcao, G., 2011. Presence of OXA-23-producing isolates of *Acinetobacter baumannii* in wastewater from hospitals in southern Brazil. *Microb. Drug Resist.* 17, 221–227. <https://doi.org/10.1089/mdr.2010.0013>
- Ferreira, L.Q., Avelar, K.E.S., Vieira, J.M.B.D., de Paula, G.R., Colombo, A.P. V, Domingues, R.M.C.P., Ferreira, M.C.S., 2007. Association between the cfxA gene and transposon Tn4555 in *Bacteroides distasonis* strains and other *Bacteroides* species. *Curr. Microbiol.* 54, 348–353. <https://doi.org/10.1007/s00284-006-0411-0>
- Figueiredo, H.C.P., Costa, F.A.A., Leal, C.A.G., Carvalho-Castro, G.A., Leite, R.C., 2012. *Weissella* sp. outbreaks in commercial rainbow trout (*Oncorhynchus mykiss*) farms in Brazil. *Vet. Microbiol.* 156, 359–366. <https://doi.org/10.1016/j.vetmic.2011.11.008>
- Fontes, L.C., Neves, P.R., Oliveira, S., Silva, K.C., Hachich, E.M., Sato, M.I.Z., Lincopan, N., 2011. Isolation of *Pseudomonas aeruginosa* coproducing metallo- β -lactamase SPM-1 and 16S rRNA methylase RmtD1 in an urban river. *Antimicrob. Agents Chemother.* 55, 3063–3064. <https://doi.org/10.1128/AAC.00138-11>
- Fortune, R.A., 1981. Investigation of a typhoid outbreak on Dominica. *Bull. Pan Am. Health Organ.* 15, 311–317.
- Fraga, S.G., Pichel, M., Costagliola, M., Cecilia, M., Jurquiza, V., Peressutti, S., Caffer, M.I., Aulet, O., Hozbor, C., Tracanna, B.C., de Gamundi, A. V, Hernandez, D., Ramirez, F.C., Akselman, R., Binsztein, N.,

2007. Environment and virulence factors of *Vibrio cholerae* strains isolated in Argentina. J. Appl. Microbiol. 103, 2448–2456. <https://doi.org/10.1111/j.1365-2672.2007.03468.x>
- Freitas, J.H.E.S., de Santana, K. V, da Silva, P.M., de Moura, M.C., Coelho, L.C.B.B., do Nascimento, A.E., Paiva, P.M.G., Napoleao, T.H., 2016. Evaluation of *Moringa oleifera* Seed Lectin as a Metal Remover in Aqueous Solutions. Protein Pept. Lett. 23, 645–649.
- Froes, A.M., da Mota, F.F., Cuadrat, R.R.C., Davila, A.M.R., 2016. Distribution and Classification of Serine beta-Lactamases in Brazilian Hospital Sewage and Other Environmental Metagenomes Deposited in Public Databases. Front. Microbiol. 7, 1790. <https://doi.org/10.3389/fmicb.2016.01790>
- Fuentefria, D.B., Ferreira, A.E., Corção, G., 2011. Antibiotic-resistant *Pseudomonas aeruginosa* from hospital wastewater and superficial water: are they genetically related? J. Environ. Manage. 92, 250–255. <https://doi.org/10.1016/j.jenvman.2010.09.001>
- Ganesh, S., Parris, D.J., DeLong, E.F., Stewart, F.J., 2014. Metagenomic analysis of size-fractionated picoplankton in a marine oxygen minimum zone. ISME J. 8, 187–211. <https://doi.org/10.1038/ismej.2013.144>
- Garibay, R.I.A., Aguilera-Arreola, M.G., Ocania, A.N., Cerezo, S.G., Mendoza, M.S., Lopez, J.M., Campos, C.E., Cravioto, A., Castro-Escarpulli, G., 2006. Serogroups, K1 antigen, and antimicrobial resistance patterns of *Aeromonas spp.* strains isolated from different sources in Mexico. Mem. Inst. Oswaldo Cruz 101, 157–161.
- Gazal, L.E.S., Puno-Sarmiento, J.J., Medeiros, L.P., Cyويا, P.S., da Silveira, W.D., Kobayashi, R.K.T., Nakazato, G., 2015. Presence of pathogenicity islands and virulence genes of extraintestinal pathogenic *Escherichia coli* (ExPEC) in isolates from avian organic fertilizer. Poult. Sci. 94, 3025–3033. <https://doi.org/10.3382/ps/pev278>
- Gili, P., Marando, G., Irisarri, J., Sagardoy, M., 2001. [Bacterial contamination and presence of *Sinorhizobium meliloti* in irrigation canal water from the Neuquen River]. Rev. Argent. Microbiol. 33, 1–8.
- Giowanella, M., Bozza, A., do Rocio Dalzoto, P., Dionisio, J.A., Andraus, S., Guimaraes, E.L.G., Pimentel, I.C., 2015. Microbiological quality of water from the rivers of Curitiba, Parana State, Brazil, and the susceptibility to antimicrobial drugs and pathogenicity of *Escherichia coli*. Environ. Monit. Assess. 187, 673. <https://doi.org/10.1007/s10661-015-4896-5>
- Giraldo, A.L., Penuela, G.A., Torres-Palma, R.A., Pino, N.J., Palominos, R.A., Mansilla, H.D., 2010. Degradation of the antibiotic oxolinic acid by photocatalysis with TiO₂ in suspension. Water Res. 44, 5158–5167. <https://doi.org/10.1016/j.watres.2010.05.011>
- Giraldo-Aguirre, A.L., Serna-Galvis, E.A., Erazo-Erazo, E.D., Silva-Agreto, J., Giraldo-Ospina, H., Florez-Acosta, O.A., Torres-Palma, R.A., 2017. Removal of beta-lactam antibiotics from pharmaceutical wastewaters using photo-Fenton process at near-neutral pH. Environ. Sci. Pollut. Res. Int. 25, 20293–20303. <https://doi.org/10.1007/s11356-017-8420-z>
- Gorriti, M.F., Dias, G.M., Chimetto, L.A., Trindade-Silva, A.E., Silva, B.S., Mesquita, M.M.A., Gregoracci, G.B., Farias, M.E., Thompson, C.C., Thompson, F.L., 2014. Genomic and phenotypic attributes of novel

salinivibrios from stromatolites, sediment and water from a high altitude lake. BMC Genomics 15, 473. <https://doi.org/10.1186/1471-2164-15-473>

Graham, D.W., Olivares-Rieumont, S., Knapp, C.W., Lima, L., Werner, D., Bowen, E., 2011. Antibiotic resistance gene abundances associated with waste discharges to the Almendares river near Havana, Cuba. Environ. Sci. Technol. 45, 418–424. <https://doi.org/10.1021/es102473z>

Granados-Chinchilla, F., Arias-Andres, M., Rodriguez, C., 2013. Tetracycline and 4-epitetracycline modified the in vitro catabolic activity and structure of a sediment microbial community from a tropical tilapia farm idiosyncratically. J. Environ. Sci. Health. B. 48, 291–301. <https://doi.org/10.1080/03601234.2013.743788>

Guevara-Almaraz, E., Hinojosa-Reyes, L., Caballero-Quintero, A., Ruiz-Ruiz, E., Hernandez-Ramirez, A., Guzman-Mar, J.L., 2015. Potential of multisyringe chromatography for the on-line monitoring of the photocatalytic degradation of antituberculosis drugs in aqueous solution. Chemosphere 121, 68–75. <https://doi.org/10.1016/j.chemosphere.2014.11.012>

Gutiérrez-Alcántara, E., Gómez-Aldapa, C., Román-Gutiérrez, A.D., Rangel-Vargas, E., González-Olivares, L.G., Castro-Rosas, J., 2016. Antimicrobial activity of *Roselle hibiscus sabdariffa calyx* extracts on culture media and carrots against multidrug-resistant *Salmonella* strains isolated from raw carrots. J. Food Saf. 36, 450–458. <https://doi.org/10.1111/jfs.12259>

Guyomard-Rabenirina, S., Dartron, C., Falord, M., Sadikalay, S., Ducat, C., Richard, V., Breurec, S., Gros, O., Talarmin, A., 2017. Resistance to antimicrobial drugs in different surface waters and wastewaters of Guadeloupe. PLoS One 12, e0173155. <https://doi.org/10.1371/journal.pone.0173155>

Heck, K., De Marco, E.G., Duarte, M.W., Salamoni, S.P., Van Der Sand, S., 2015. Pattern of multiresistant to antimicrobials and heavy metal tolerance in bacteria isolated from sewage sludge samples from a composting process at a recycling plant in southern Brazil. Environ. Monit. Assess. 187, 328. <https://doi.org/10.1007/s10661-015-4575-6>

Hussain, S., Gul, S., Steter, J.R., Miwa, D.W., Motheo, A.J., 2015. Route of electrochemical oxidation of the antibiotic sulfamethoxazole on a mixed oxide anode. Environ. Sci. Pollut. Res. Int. 22, 15004–15015. <https://doi.org/10.1007/s11356-015-4699-9>

Ilhan, Z.E., Ong, S.K., Moorman, T.B., 2012. Herbicide and antibiotic removal by woodchip denitrification filters: sorption processes. Water, Air, Soil Pollut. 223, 2651–2662. <https://doi.org/10.1007/s11270-011-1057-5>

Isaac-Márquez, A.P., Lezama-Davila, C.M., Eslava-Campos, C., Navarro-Ocana, A., Cravioto-Quintana, A., 1998. Serotypes of *Vibrio cholerae* non-O1 isolated from water supplies for human consumption in Campeche, Mexico and their antibiotic susceptibility pattern. Mem. Inst. Oswaldo Cruz 93, 17–22.

Jank, L., Hoff, R.B., da Costa, F.J., Pizzolato, T.M., 2014. Simultaneous determination of eight antibiotics from distinct classes in surface and wastewater samples by solid-phase extraction and highperformance liquid chromatography–electrospray ionisation mass spectrometry. Int. J. Environ. Anal. Chem. 94, 1013–1037. <https://doi.org/10.1080/03067319.2014.914184>

- Jayme, M.M.A., Castro, R.O., Silva, C.A.M., Silva, M.M., Carmo, F.L. do, Araujo, F.V. de, 2017. Evaluation of the biotechnological potential of bacterioplankton from Niterói coast, RJ. *Comptes Rendus - Biol.* 340, 324–329. <https://doi.org/10.1016/j.crv.2017.06.004>
- Jojoa-Sierra, S.D., Silva-Agredo, J., Herrera-Calderon, E., Torres-Palma, R.A., 2017. Elimination of the antibiotic norfloxacin in municipal wastewater, urine and seawater by electrochemical oxidation on IrO₂ anodes. *Sci. Total Environ.* 575, 1228–1238. <https://doi.org/10.1016/j.scitotenv.2016.09.201>
- Kharroub, K., Lizama, C., Aguilera, M., Boulahrouf, A., Campos, V., Ramos-Cormenzana, A., Monteoliva-Sanchez, M., 2008. *Halomicrobium katesii* sp. nov., an extremely halophilic archaeon. *Int. J. Syst. Evol. Microbiol.* 58, 2354–2358. <https://doi.org/10.1099/ijs.0.65662-0>
- Knapp, C.W., Lima, L., Olivares-Rieumont, S., Bowen, E., Werner, D., Graham, D.W., 2012. Seasonal variations in antibiotic resistance gene transport in the Almendares river, Havana, Cuba. *Front. Microbiol.* 3, 396. <https://doi.org/10.3389/fmicb.2012.00396>
- Krzyzanowski, F.J., Zappellini, L., Martone-Rocha, S., Dropa, M., Matte, M.H., Nacache, F., Razzolini, M.T.P., 2014. Quantification and characterization of *Salmonella* spp. isolates in sewage sludge with potential usage in agriculture. *BMC Microbiol.* 14, 263. <https://doi.org/10.1186/s12866-014-0263-x>
- Kuzina, L. V., Peloquin, J.J., Vacek, D.C., Miller, T.A., 2001. Isolation and identification of bacteria associated with adult laboratory Mexican fruit flies, *Anastrepha ludens* (Diptera: Tephritidae). *Curr. Microbiol.* 42, 290–294.
- Lara, P.A., Rodríguez, D.C., Pañuela, G.A., 2016. Application of coagulation by sweep for removal of metals in natural water used in dairy cattle. *Afinidad LXXIV*, 299–304.
- Lima, L., Baeta, B.E.L., Lima, D.R.S., Afonso, R.J.C.F., de Aquino, S.F., Libanio, M., 2016. Comparison between two forms of granular activated carbon for the removal of pharmaceuticals from different waters. *Environ. Technol.* 37, 1334–1345. <https://doi.org/10.1080/09593330.2015.1114030>
- Lima-Bittencourt, C.I., Astolfi-Filho, S., Chartone-Souza, E., Santos, F.R., Nascimento, A.M.A., 2007a. Analysis of *Chromobacterium* sp. natural isolates from different Brazilian ecosystems. *BMC Microbiol.* 7, 58. <https://doi.org/10.1186/1471-2180-7-58>
- Lima-Bittencourt, C.I., Cursino, L., Goncalves-Dornelas, H., Pontes, D.S., Nardi, R.M.D., Callisto, M., Chartone-Souza, E., Nascimento, A.M.A., 2007b. Multiple antimicrobial resistance in *Enterobacteriaceae* isolates from pristine freshwater. *Genet. Mol. Res.* 6, 510–521.
- Lima-Bittencourt, C.I., Costa, P.S., Hollatz, C., Raposeiras, R., Santos, F.R., Chartone-Souza, E., Nascimento, A.M.A., 2011a. Comparative biogeography of *Chromobacterium* from the neotropics. *Antonie Van Leeuwenhoek* 99, 355–370. <https://doi.org/10.1007/s10482-010-9501-x>
- Lima-Bittencourt, C.I., Costa, P.S., Barbosa, F.A.R., Chartone-Souza, E., Nascimento, A.M.A., 2011b. Characterization of a *Chromobacterium haemolyticum* population from a natural tropical lake. *Lett. Appl. Microbiol.* 52, 642–650. <https://doi.org/10.1111/j.1472-765X.2011.03052.x>
- Lin, C.-H., Goyne, K.W., Kremer, R.J., Lerch, R.N., Garrett, H.E., 2010. Dissipation of sulfamethazine and tetracycline in the root zone of grass and tree species. *J. Environ. Qual.* 39, 1269–1278.

- Lopes, T.R., Costa Junior, I.L., Periotto, F., Pletsch, A.L., 2016a. Antibiotic resistance in *E. coli* isolated in effluent from wastewater treatment plant and sediment in receiver body. *Int. J. River Basin Manag.* 14, 441–445. <https://doi.org/10.1080/15715124.2016.1201094>
- Lopes, G.V., Michael, G.B., Cardoso, M., Schwarz, S., 2016b. Antimicrobial resistance and class 1 integron-associated gene cassettes in *Salmonella enterica* serovar Typhimurium isolated from pigs at slaughter and abattoir environment. *Vet. Microbiol.* 194, 84–92. <https://doi.org/10.1016/j.vetmic.2016.04.020>
- Lopes, F.A.C., Catao, E.C.P., Santana, R.H., Cabral, A. de S., Paranhos, R., Rangel, T.P., de Rezende, C.E., Edwards, R.A., Thompson, C.C., Thompson, F.L., Kruger, R.H., 2016c. Microbial Community Profile and Water Quality in a Protected Area of the Caatinga Biome. *PLoS One* 11, e0148296. <https://doi.org/10.1371/journal.pone.0148296>
- Lopez Cuevas, O., Leon-Felix, J., Jimenez Edeza, M., Chaidez Quiroz, C., 2009. Detection and antibiotic resistance of *Escherichia coli* and *Salmonella* in water and agricultural soil. *Rev. Fitotec. Mex.* 32, 119–126.
- Lopez, L., Santamaria, J., Sanchez, A., Castro, L., Moreno, J.L., 2012. Presence of tetracycline resistant bacteria and genes in grasslandbased animal production systems. *Cienc. e Investig. Agrar.* 39, 411–423. <https://doi.org/10.4067/S0718-16202012000300002>
- López-Pérez, M., Mirete, S., Jardon-Valadez, E., Gonzalez-Pastor, J.E., 2013. Identification and modeling of a novel chloramphenicol resistance protein detected by functional metagenomics in a wetland of Lerma, Mexico. *Int. Microbiol.* 16, 103–111. <https://doi.org/10.2436/20.1501.01.185>
- Lugo-Melchor, Y., Quinones, B., Amezcuita-Lopez, B.A., Leon-Felix, J., Garcia-Estrada, R., Chaidez, C., 2010. Characterization of tetracycline resistance in *Salmonella enterica* strains recovered from irrigation water in the Culiacan Valley, Mexico. *Microb. Drug Resist.* 16, 185–190. <https://doi.org/10.1089/mdr.2010.0022>
- Luiz, D.B., Genena, A.K., Virmond, E., Jose, H.J., Moreira, R.F.P.M., Gebhardt, W., Schroder, H.F., 2010. Identification of degradation products of erythromycin A arising from ozone and advanced oxidation process treatment. *Water Environ. Res.* 82, 797–805.
- Mafla, S., Moraga, R., Leon, C.G., Guzman-Fierro, V.G., Yanez, J., Smith, C.T., Mondaca, M.A., Campos, V.L., 2015. Biodegradation of roxarsone by a bacterial community of underground water and its toxic impact. *World J. Microbiol. Biotechnol.* 31, 1267–1277. <https://doi.org/10.1007/s11274-015-1886-2>
- Magalhães, M.J.T.L., Pontes, G., Serra, P.T., Balieiro, A., Castro, D., Pieri, F.A., Crainey, J.L., Nogueira, P.A., Orlandi, P.P., 2016. Multidrug resistant *Pseudomonas aeruginosa* survey in a stream receiving effluents from ineffective wastewater hospital plants. *BMC Microbiol.* 16, 193. <https://doi.org/10.1186/s12866-016-0798-0>
- Magdaleno, A., Saenz, M.E., Juarez, A.B., Moretton, J., 2015. Effects of six antibiotics and their binary mixtures on growth of *Pseudokirchneriella subcapitata*. *Ecotoxicol. Environ. Saf.* 113, 72–78. <https://doi.org/10.1016/j.ecoenv.2014.11.021>

- Maizel, D., Utturkar, S.M., Brown, S.D., Ferrero, M.A., Rosen, B.P., 2015. Draft Genome Sequence of *Brevibacterium linens* AE038-8, an Extremely Arsenic-Resistant Bacterium. *Genome Announc.* 3. <https://doi.org/10.1128/genomeA.00316-15>
- Maran, N.H., Crispim, B. do A., Iahnn, S.R., Araujo, R.P. de, Grisolia, A.B., Oliveira, K.M.P. de, 2016. Depth and Well Type Related to Groundwater Microbiological Contamination. *Int. J. Environ. Res. Public Health* 13. <https://doi.org/10.3390/ijerph13101036>
- Marcelino, R.B.P., Leao, M.M.D., Lago, R.M., Amorim, C.C., 2017. Multistage ozone and biological treatment system for real wastewater containing antibiotics. *J. Environ. Manage.* 195, 110–116. <https://doi.org/10.1016/j.jenvman.2016.04.041>
- Martínez, M.C., Retamal, P., Rojas-Aedo, J.F., Fernandez, J., Fernandez, A., Lapierre, L., 2017. Multidrug-Resistant Outbreak-Associated *Salmonella* Strains in Irrigation Water from the Metropolitan Region, Chile. *Zoonoses Public Health* 64, 299–304. <https://doi.org/10.1111/zph.12311>
- Martinez, M., Mondaca, M.A., Zemelman, R., 1994. Antibiotic-resistant gram-negative bacilli in the sewage of the City of Concepcion, Chile. *Rev. Latinoam. Microbiol.* 36, 39–46.
- Martins, A.F., Vasconcelos, T.G., Henriques, D.M., Frank, C. da S., König, A., Kümmerer, K., 2008. Concentration of ciprofloxacin in Brazilian hospital effluent and preliminary risk assessment: A case study. *Clean - Soil, Air, Water* 36, 264–269. <https://doi.org/10.1002/clen.200700171>
- Martins, V.V., Zanetti, M.O.B., Pitondo-Silva, A., Stehling, E.G., 2014. Aquatic environments polluted with antibiotics and heavy metals: a human health hazard. *Environ. Sci. Pollut. Res. Int.* 21, 5873–5878. <https://doi.org/10.1007/s11356-014-2509-4>
- Medeiros, J.D., Cantao, M.E., Cesar, D.E., Nicolas, M.F., Diniz, C.G., Silva, V.L., Vasconcelos, A.T.R. de, Coelho, C.M., 2016. Comparative metagenome of a stream impacted by the urbanization phenomenon. *Braz. J. Microbiol.* 47, 835–845. <https://doi.org/10.1016/j.bjm.2016.06.011>
- Melo, C.F., Dezotti, M., Marques, M.R.C., 2016. A comparison between the oxidation with laccase and horseradish peroxidase for triclosan conversion. *Environ. Technol.* 37, 335–343. <https://doi.org/10.1080/09593330.2015.1069897>
- Menezes, F.G.R.D.E., Rodriguez, M.T.T., Carvalho, F.C.T.D.E., Reboucas, R.H., Costa, R.A., Sousa, O.V.D.E., Hofer, E., Vieira, R.H.S.F., 2017. Pathogenic *Vibrio* species isolated from estuarine environments (Ceara, Brazil) - antimicrobial resistance and virulence potential profiles. *An. Acad. Bras. Cienc.* 89, 1175–1188. <https://doi.org/10.1590/0001-3765201720160191>
- Miles, T.D., McLaughlin, W., Brown, P.D., n.d. Antimicrobial resistance of *Escherichia coli* isolates from broiler chickens and humans. <https://doi.org/10.1186/1746-6148-2-7>
- Miranda, C.D., Castillo, G., 1998. Resistance to antibiotic and heavy metals of motile aeromonads from Chilean freshwater. *Sci. Total Environ.* 224, 167–176.
- Miranda, C.D., Zemelman, R., 2002. Bacterial resistance to oxytetracycline in Chilean salmon farming. *Aquaculture* 212, 31–47. [https://doi.org/10.1016/S0044-8486\(02\)00124-2](https://doi.org/10.1016/S0044-8486(02)00124-2)

- Miranda, C.D., Kehrenberg, C., Ulep, C., Schwarz, S., Roberts, M.C., 2003. Diversity of Tetracycline Resistance Genes in Bacteria from Chilean Salmon Farms. *Antimicrob. Agents Chemother.* 47, 883–888. <https://doi.org/10.1128/AAC.47.3.883-888.2003>
- Miranda, C.D., Rojas, R., 2007. Occurrence of florfenicol resistance in bacteria associated with two Chilean salmon farms with different history of antibacterial usage. *Aquaculture* 266, 39–46. <https://doi.org/10.1016/j.aquaculture.2007.02.007>
- Miranda, C.D., Rojas, R., Garrido, M., Geisse, J., González, G., 2013. Role of shellfish hatchery as a reservoir of antimicrobial resistant bacteria. *Mar. Pollut. Bull.* <https://doi.org/10.1016/j.marpolbul.2013.06.032>
- Miranda, C.C., de Filippis, I., Pinto, L.H., Coelho-Souza, T., Bianco, K., Cacci, L.C., Picão, R.C., Clementino, M.M., 2015a. Genotypic characteristics of multidrug-resistant *Pseudomonas aeruginosa* from hospital wastewater treatment plant in Rio de Janeiro, Brazil. *J. Appl. Microbiol.* 118, 1276–1286. <https://doi.org/10.1111/jam.12792>
- Miranda, C.D., Rojas, R., Geisse, J., Romero, J., González-Rocha, G., 2015b. Scallop larvae hatcheries as source of bacteria carrying genes encoding for non-enzymatic phenicol resistance. *Mar. Pollut. Bull.* <https://doi.org/10.1016/j.marpolbul.2015.04.026>
- Mondragon, V.A., Llamas-Perez, D.F., Gonzalez-Guzman, G.E., Marquez-Gonzalez, A.R., Padilla-Noriega, R., Duran-Avelar, M. de J., Franco, B., 2011. Identification of *Enterococcus faecalis* bacteria resistant to heavy metals and antibiotics in surface waters of the Mololoa River in Tepic, Nayarit, Mexico. *Environ. Monit. Assess.* 183, 329–340. <https://doi.org/10.1007/s10661-011-1924-y>
- Monteiro, S.H., Garcia, F., Gozi, K.S., Romera, D.M., Francisco, J.G., Moura-Andrade, G.C.R., Tornisiello, V.L., 2016. Relationship between antibiotic residues and occurrence of resistant bacteria in Nile tilapia (*Oreochromis niloticus*) cultured in cage-farm. *J. Environ. Sci. Health. B.* 51, 817–823. <https://doi.org/10.1080/03601234.2016.1208457>
- Montezzi, L.F., Campana, E.H., Correa, L.L., Justo, L.H., Paschoal, R.P., da Silva, I.L.V.D., Souza, M. do C.M., Drolshagen, M., Picao, R.C., 2015. Occurrence of carbapenemase-producing bacteria in coastal recreational waters. *Int. J. Antimicrob. Agents* 45, 174–177. <https://doi.org/10.1016/j.ijantimicag.2014.10.016>
- Montoya, R., Dominguez, M., Gonzalez, C., Mondaca, M.A., Zemelman, R., 1992. Susceptibility to antimicrobial agents and plasmid carrying in *Aeromonas hydrophila* isolated from two estuarine systems. *Microbios* 69, 181–186.
- Moreira, L.B., Maranhão, L.A., Baena-Nogueras, R.M., Lara-Martin, P.A., Martin-Diaz, M.L., 2016. Effects of novobiocin and methotrexate on the benthic amphipod *Ampelisca brevicornis* exposed to spiked sediments. *Mar. Environ. Res.* 122, 169–177. <https://doi.org/10.1016/j.marenvres.2016.11.003>
- Muñoz, D., de Fermin, Y.C., de Marín, C.G., Marval, H., 2012. Prevalencia y susceptibilidad a antibióticos de cepas móviles de *Aeromonas* aisladas del ostión de mangle (*Crassostrea rhizophorae*). *Rev. Científica* 22, 565–573.

- Nascimento, T., Cantamessa, R., Melo, L., Fernandes, M.R., Fraga, E., Dropa, M., Sato, M.I.Z., Cerdeira, L., Lincopan, N., 2017. International high-risk clones of *Klebsiella pneumoniae* KPC-2/CC258 and *Escherichia coli* CTX-M-15/CC10 in urban lake waters. *Sci. Total Environ.* 598, 910–915. <https://doi.org/10.1016/j.scitotenv.2017.03.207>
- Newaj-Fyzul, A., Mutani, A., Ramsubhag, A., Adesiyun, A., 2008. Prevalence of bacterial pathogens and their anti-microbial resistance in Tilapia and their pond water in Trinidad. *Zoonoses Public Health* 55, 206–213. <https://doi.org/10.1111/j.1863-2378.2007.01098.x>
- Nieto, J., Freer, J., Contreras, D., Candal, R.J., Sileo, E.E., Mansilla, H.D., 2008. Photocatalyzed degradation of flumequine by doped TiO₂ and simulated solar light. *J. Hazard. Mater.* 155, 45–50. <https://doi.org/10.1016/j.jhazmat.2007.11.026>
- Núñez, L., Tornello, C., Puentes, N., Espigares, E., Moreno, E., Espigares, M., Moretton, J., 2016. Hospital effluent constitutes a source of vancomycin-resistant *Enterococci*. *Ars Pharm.* 57, 121–126. <https://doi.org/10.4321/S2340-98942016000300003>
- Ochoa-Sanchez, L.E., Vinuesa, P., 2017. Evolutionary Genetic Analysis Uncovers Multiple Species with Distinct Habitat Preferences and Antibiotic Resistance Phenotypes in the *Stenotrophomonas maltophilia* Complex. *Front. Microbiol.* 8, 1548. <https://doi.org/10.3389/fmicb.2017.01548>
- Ohno, A., Marui, A., Castro, E.S., Reyes, A.A., Elio-Calvo, D., Kasitani, H., Ishii, Y., Yamaguchi, K., 1997. Enteropathogenic bacteria in the La Paz River of Bolivia. *Am. J. Trop. Med. Hyg.* 57, 438–444.
- Oliveira, C.J.B., Carvalho, L.F.O.S., Fernandes, S.A., Tavechio, A.T., Menezes, C.C.P., Domingues, F.J.J., 2002. Antimicrobial resistance of Salmonella serotypes isolated from slaughter-age pigs and environmental samples. *Microb. Drug Resist.* 8, 407–411. <https://doi.org/10.1089/10766290260469697>
- Orduz, S., Zuluaga, J.S., Diaz, T., Gomez, C.L., Rojas, W., 1992. Effect of antibiotic treatment on mycelial growth of isolates of the mosquito pathogenic fungus *Lagenidium giganteum* (Oomycetes: *Lagenidiales*) from Australia, Colombia and United States. *J. Am. Mosq. Control Assoc.* 8, 427–429.
- Oyarzabal, O.A., Backert, S., Williams, L.L., Lastovica, A.J., Miller, R.S., Pierce, S.J., Vieira, S.L., Rebollo-Carrato, F., 2008. Molecular typing, serotyping and cytotoxicity testing of *Campylobacter jejuni* strains isolated from commercial broilers in Puerto Rico. *J. Appl. Microbiol.* 105, 800–812. <https://doi.org/10.1111/j.1365-2672.2008.03809.x>
- Pachiadaki, M.G., Redou, V., Beaudoin, D.J., Burgaud, G., Edgcomb, V.P., 2016. Fungal and Prokaryotic Activities in the Marine Subsurface Biosphere at Peru Margin and Canterbury Basin Inferred from RNA-Based Analyses and Microscopy. *Front. Microbiol.* 7, 846. <https://doi.org/10.3389/fmicb.2016.00846>
- Padilla, C., Lobos, O., 2013. Virulence, bacterocin genes and antibacterial susceptibility in *Enterococcus faecalis* strains isolated from water wells for human consumption. *Springerplus* 2, 43. <https://doi.org/10.1186/2193-1801-2-43>
- Paes, F.A., Hissa, D.C., Angelim, A.L., Pinto, N.W., Grangeiro, T.B., Melo, V.M.M., 2012. Diversity of a chlorine-resistant *Bacillus* population isolated from a wastewater treatment station. *Water Environ. Res.* 84, 274–281.

- Paiva, M.C., Avila, M.P., Reis, M.P., Costa, P.S., Nardi, R.M.D., Nascimento, A.M.A., 2015. The Microbiota and Abundance of the Class 1 Integron-Integrase Gene in Tropical Sewage Treatment Plant Influent and Activated Sludge. *PLoS One* 10, e0131532. <https://doi.org/10.1371/journal.pone.0131532>
- Paiva, M.C., Reis, M.P., Costa, P.S., Dias, M.F., Bleicher, L., Scholte, L.L.S., Nardi, R.M.D., Nascimento, A.M.A., 2017. Identification of new bacteria harboring *qnrS* and *aac(6')-Ib/cr* and mutations possibly involved in fluoroquinolone resistance in raw sewage and activated sludge samples from a full-scale WWTP. *Water Res.* 110, 27–37. <https://doi.org/10.1016/j.watres.2016.11.056>
- Palhares, J.C.P., Kich, J.D., Bessa, M.C., Biesus, L.L., Berno, L.G., Triques, N.J., 2014. *Salmonella* and antimicrobial resistance in an animal-based agriculture river system. *Sci. Total Environ.* <https://doi.org/10.1016/j.scitotenv.2013.11.052>
- Pallecchi, L., Bartoloni, A., Riccobono, E., Fernandez, C., Mantella, A., Magnelli, D., Mannini, D., Strohmeier, M., Bartalesi, F., Rodriguez, H., Gotuzzo, E., Rossolini, G.M., 2012. Quinolone resistance in absence of selective pressure: the experience of a very remote community in the Amazon forest. *PLoS Negl. Trop. Dis.* 6, e1790. <https://doi.org/10.1371/journal.pntd.0001790>
- Falcao, D.P., Lustri, W.R., Bauab, T.M., 1998. Incidence of non-O1 *Vibrio cholerae* and *Aeromonas* spp. in fresh water in Araraquara, Brazil. *Curr. Microbiol.* 37, 28–31.
- Patel, R.H., Pedersen, K., Kotelnikova, S., 2010. The bacteriological analysis and health risks in the urban estuary of St. George's Bay, Grenada, West Indies. *J. Environ. Health* 73, 22–26.
- Pavan, M.E., Pavan, E.E., Lopez, N.I., Levin, L., Pettinari, M.J., 2015. Living in an Extremely Polluted Environment: Clues from the Genome of Melanin-Producing *Aeromonas salmonicida* subsp. *pectinolytica* 34melT. *Appl. Environ. Microbiol.* 81, 5235–5248. <https://doi.org/10.1128/AEM.00903-15>
- Pavissich, J.P., Silva, M., Gonzalez, B., 2010. Sulfate reduction, molecular diversity, and copper amendment effects in bacterial communities enriched from sediments exposed to copper mining residues. *Environ. Toxicol. Chem.* 29, 256–264. <https://doi.org/10.1002/etc.43>
- Pehrsson, E.C., Tsukayama, P., Patel, S., Mejia-Bautista, M., Sosa-Soto, G., Navarrete, K.M., Calderon, M., Cabrera, L., Hoyos-Arango, W., Bertoli, M.T., Berg, D.E., Gilman, R.H., Dantas, G., 2016. Interconnected microbiomes and resistomes in low-income human habitats. *Nature* 533, 212–216. <https://doi.org/10.1038/nature17672>
- Peltzer, P.M., Lajmanovich, R.C., Attademo, A.M., Junges, C.M., Teglia, C.M., Martinuzzi, C., Curi, L., Culzoni, M.J., Goicoechea, H.C., 2017. Ecotoxicity of veterinary enrofloxacin and ciprofloxacin antibiotics on anuran amphibian larvae. *Environ. Toxicol. Pharmacol.* 51, 114–123. <https://doi.org/10.1016/j.etap.2017.01.021>
- Perales-Vela, H.V., Garcia, R.V., Gomez-Juarez, E.A., Salcedo-Alvarez, M.O., Canizares-Villanueva, R.O., 2016. Streptomycin affects the growth and photochemical activity of the alga *Chlorella vulgaris*. *Ecotoxicol. Environ. Saf.* 132, 311–317. <https://doi.org/10.1016/j.ecoenv.2016.06.019>
- Pereira, D.J., Figueiredo, H.C.P., Carneiro, D.O., Leal, G.A.G., 2006. Minimal inhibitory concentration to oxitetracycline in *Aeromonas hydrophila* strains isolated from different sources. *Cienc. e Agrotecnologia* 30, 1190–1195. <https://doi.org/10.1590/S1413-70542006000600023>

- Peres, M.S., Maniero, M.G., Guimarães, J.R., 2015. Photocatalytic degradation of ofloxacin and evaluation of the residual antimicrobial activity. *Photochem. Photobiol. Sci.* 14, 556–562. <https://doi.org/10.1039/c4pp00256c>
- Perez, P.F., Constanza, O., Garre, M., Morelli, I., Martinez, A., Vecchioli, G., Paineira, M.T., 1993. [Isolation of antibiotic-resistant *Escherichia coli* from the water of the Rio de la Plata]. *Rev. Argent. Microbiol.* 25, 7–14.
- Perini, J.A. de L., Silva, B.C.E., Tonetti, A.L., Nogueira, R.F.P., 2017. Photo-Fenton degradation of the pharmaceuticals ciprofloxacin and fluoxetine after anaerobic pre-treatment of hospital effluent. *Environ. Sci. Pollut. Res. Int.* 24, 6233–6240. <https://doi.org/10.1007/s11356-016-7416-4>
- Picão, R.C., Cardoso, J.P., Campana, E.H., Nicoletti, A.G., Petrolini, F.V.B., Assis, D.M., Juliano, L., Gales, A.C., 2013. The route of antimicrobial resistance from the hospital effluent to the environment: focus on the occurrence of KPC-producing *Aeromonas* spp. and *Enterobacteriaceae* in sewage. *Diagn. Microbiol. Infect. Dis.* 76, 80–85. <https://doi.org/10.1016/j.diagmicrobio.2013.02.001>
- Pillai, S.D., Rubio, E., Ricke, S.C., 1996. Prevalence of fluoroquinolone-resistant *Escherichia coli* in agricultural and municipal waste streams. *Bioresour. Technol.* 58, 57–60. [https://doi.org/10.1016/S0960-8524\(96\)00110-1](https://doi.org/10.1016/S0960-8524(96)00110-1)
- Pillai, S.D., Widmer, K.W., G, M.K., Ricke, S.C., 1997. Antibiotic resistance profiles of *Escherichia coli* isolated from rural and urban environments. *J. Environ. Sci. Heal.* 32, 1665–1675. <https://doi.org/10.1080/10934529709376635>
- Pissetti, C., Werlang, G.O., Kich, J.D., Cardoso, M., 2016. Detection of genotypically related multi-resistant *Escherichia coli* isolates in pig feces and carcasses. *Acta Sci. Vet.* 44, 1376.
- Poblete-Morales, M., Irgang, R., Henriquez-Nunez, H., Toranzo, A.E., Kronvall, G., Avendano-Herrera, R., 2013. *Vibrio ordalii* antimicrobial susceptibility testing--modified culture conditions required and laboratory-specific epidemiological cut-off values. *Vet. Microbiol.* 165, 434–442. <https://doi.org/10.1016/j.vetmic.2013.04.024>
- Poma, V., Mamani, N., Iñiguez, V., 2016. Impact of urban contamination of the La Paz River basin on thermotolerant coliform density and occurrence of multiple antibiotic resistant enteric pathogens in river water, irrigated soil and fresh vegetables. *Springerplus* 5, 499. <https://doi.org/10.1186/s40064-016-2132-6>
- Ponce-Soto, G.Y., Aguirre-von-Wobeser, E., Eguiarte, L.E., Elser, J.J., Lee, Z.M.-P., Souza, V., 2015. Enrichment experiment changes microbial interactions in an ultra-oligotrophic environment. *Front. Microbiol.* 6, 246. <https://doi.org/10.3389/fmicb.2015.00246>
- Pontes, D.S., Pinheiro, F.A., Lima-Bittencourt, C.I., Guedes, R.L.M., Cursino, L., Barbosa, F., Santos, F.R., Chartone-Souza, E., Nascimento, A.M.A., 2009. Multiple antimicrobial resistance of gram-negative bacteria from natural oligotrophic lakes under distinct anthropogenic influence in a tropical region. *Microb. Ecol.* 58, 762–772. <https://doi.org/10.1007/s00248-009-9539-3>

- Pontes, D.S., Lima-Bittencourt, C.I., Azevedo, M.S.P., Chartone-Souza, E., Nascimento, A.M.A., 2007. Phenotypic and genetic analysis of *Enterobacter* spp. from a Brazilian oligotrophic freshwater lake. *Can. J. Microbiol.* 53, 983–991. <https://doi.org/10.1139/W07-060>
- Porras, J., Bedoya, C., Silva-Agredo, J., Santamaria, A., Fernandez, J.J., Torres-Palma, R.A., 2016. Role of humic substances in the degradation pathways and residual antibacterial activity during the photodecomposition of the antibiotic ciprofloxacin in water. *Water Res.* 94, 1–9. <https://doi.org/10.1016/j.watres.2016.02.024>
- Prabakaran, S.R., Suresh, K., Manorama, R., Delille, D., Shivaji, S., 2005. *Marinomonas ushuaiensis* sp. nov., isolated from coastal sea water in Ushuaia, Argentina, sub-Antarctica. *Int. J. Syst. Evol. Microbiol.* 55, 309–313. <https://doi.org/10.1099/ijs.0.63363-0>
- Prado, B., Lizama, C., Aguilera, M., Ramos-Cormenzana, A., Fuentes, S., Campos, V., Monteoliva-Sanchez, M., 2006. *Chromohalobacter nigrandesensis* sp. nov., a moderately halophilic, Gram-negative bacterium isolated from Lake Tebenquiche on the Atacama Saltern, Chile. *Int. J. Syst. Evol. Microbiol.* 56, 647–651. <https://doi.org/10.1099/ijs.0.63983-0>
- Prado, T., Pereira, W.C., Silva, D.M., Seki, L.M., Carvalho, A.P.D., Asensi, M.D., 2008. Detection of extended-spectrum beta-lactamase-producing *Klebsiella pneumoniae* in effluents and sludge of a hospital sewage treatment plant. *Lett. Appl. Microbiol.* 46, 136–141. <https://doi.org/10.1111/j.1472-765X.2007.02275.x>
- Queiroz, F.B., Brandt, E.M.F., Aquino, S.F., Chernicharo, C.A.L., Afonso, R.J.C.F., 2012. Occurrence of pharmaceuticals and endocrine disruptors in raw sewage and their behavior in UASB reactors operated at different hydraulic retention times. *Water Sci. Technol.* 66, 2562–2569. <https://doi.org/10.2166/wst.2012.482>
- Ramírez Castillo, F.Y., Avelar Gonzalez, F.J., Garneau, P., Marquez Diaz, F., Guerrero Barrera, A.L., Harel, J., 2013. Presence of multi-drug resistant pathogenic *Escherichia coli* in the San Pedro River located in the State of Aguascalientes, Mexico. *Front. Microbiol.* 4, 147. <https://doi.org/10.3389/fmicb.2013.00147>
- Rebello, R.C. de L., Regua-Mangia, A.H., 2014. Potential enterovirulence and antimicrobial resistance in *Escherichia coli* isolates from aquatic environments in Rio de Janeiro, Brazil. *Sci. Total Environ.* 490, 19–27. <https://doi.org/10.1016/j.scitotenv.2014.04.040>
- Reboucas, R.H., de Sousa, O.V., Lima, A.S., Vasconcelos, F.R., de Carvalho, P.B., Vieira, R.H.S. dos F., 2011. Antimicrobial resistance profile of *Vibrio* species isolated from marine shrimp farming environments (*Litopenaeus vannamei*) at Ceara, Brazil. *Environ. Res.* 111, 21–24. <https://doi.org/10.1016/j.envres.2010.09.012>
- Reis, M.P., Dias, M.F., Costa, P.S., Avila, M.P., Leite, L.R., de Araujo, F.M.G., Salim, A.C.M., Bucciarelli-Rodriguez, M., Oliveira, G., Chartone-Souza, E., Nascimento, A.M.A., 2016. Metagenomic signatures of a tropical mining-impacted stream reveal complex microbial and metabolic networks. *Chemosphere* 161, 266–273. <https://doi.org/10.1016/j.chemosphere.2016.06.097>
- Resende, J.A., Silva, V.L., Fontes, C.O., Souza-Filho, J.A., Rocha de Oliveira, T.L., Coelho, C.M., Cesar, D.E., Diniz, C.G., 2012. Multidrug-resistance and toxic metal tolerance of medically important bacteria isolated from an aquaculture system. *Microbes Environ.* 27, 449–455.

- Reynoso, E., Nesci, A., Allegretti, P., Criado, S., Biasutti, M.A., 2012. Kinetic and mechanistic aspects of sensitized photodegradation of β -lactam antibiotics: Microbiological implications. Redox Rep. <https://doi.org/10.1179/1351000212Y.0000000032>
- Reynoso, E., Spesia, M.B., Garcia, N.A., Biasutti, M.A., Criado, S., 2015. Riboflavin-sensitized photooxidation of Ceftriaxone and Cefotaxime. Kinetic study and effect on *Staphylococcus aureus*. J. Photochem. Photobiol. B. 142, 35–42. <https://doi.org/10.1016/j.jphotobiol.2014.11.004>
- Ribeiro Dias, J.C., Vicente, A.C., Hofer, E., 1987. [Fecal coliforms in sewage waters. I. Resistance to antibiotics, heavy metals and colicinogeny]. Mem. Inst. Oswaldo Cruz 82, 335–343.
- Ribeiro, R. V, Reis, E.M.F., Reis, C.M.F., Freitas-Almeida, A.C., Rodrigues, D.P., 2010. Incidence and antimicrobial resistance of enteropathogens isolated from an integrated aquaculture system. Lett. Appl. Microbiol. 51, 611–618. <https://doi.org/10.1111/j.1472-765X.2010.02946.x>
- Rivera, S.C., Hazen, T.C., Toranzos, G.A., 1988. Isolation of fecal coliforms from pristine sites in a tropical rain forest. Appl. Environ. Microbiol. 54, 513–517.
- Robledo Zacarías, V.H., Velázquez Machuca, M.A., Montañez Soto, J.L., Pimentel Equihua, J.L., Vallejo Cardona, A.A., López Calvillo, M.D., Venegas González, J., 2017. Hidroquímica y contaminantes emergentes en aguas residuales urbano industriales de Morelia, Michoacán, México. Rev. Int. Contam. Ambient. 33, 221–235. <https://doi.org/10.20937/RICA.2017.33.02.04>
- Rocha, R.D.S., Sousa, O.V. de, Vieira, R.H.S.D.F., 2016. Multidrug-resistant *Vibrio* associated with an estuary affected by shrimp farming in Northeastern Brazil. Mar. Pollut. Bull. 105, 337–340. <https://doi.org/10.1016/j.marpolbul.2016.02.001>
- Rodas-Suárez, O.R., Flores-Pedroche, J.F., Betancourt-Rule, J.M., Quinones-Ramirez, E.I., Vazquez-Salinas, C., 2006. Occurrence and antibiotic sensitivity of *Listeria monocytogenes* strains isolated from oysters, fish, and estuarine water. Appl. Environ. Microbiol. 72, 7410–7412. <https://doi.org/10.1128/AEM.00956-06>
- Rodrigues-Silva, C., Maniero, M.G., Rath, S., Guimaraes, J.R., 2013. Degradation of flumequine by the Fenton and photo-Fenton processes: evaluation of residual antimicrobial activity. Sci. Total Environ. 445–446, 337–346. <https://doi.org/10.1016/j.scitotenv.2012.12.079>
- Rodríguez, C., Lang, L., Wang, A., Altendorf, K., Garcia, F., Lipski, A., 2006. Lettuce for human consumption collected in Costa Rica contains complex communities of culturable oxytetracycline- and gentamicin-resistant bacteria. Appl. Environ. Microbiol. 72, 5870–5876. <https://doi.org/10.1128/AEM.00963-06>
- Rodríguez, N.J., Zaidi, B.R., 2007. Analysis of antibiotic resistance patterns of fecal *Enterococcus* in coastal waters of Puerto Rico, in: NATO Security through Science Series C: Environmental Security. pp. 323–330. https://doi.org/10.1007/978-1-4020-6027-4_32
- Roe, M.T., Vega, E., Pillai, S.D., 2003. Antimicrobial Resistance Markers of Class 1 and Class 2 Integron-bearing *Escherichia coli* from Irrigation Water and Sediments 9, 5–9.

- Rojas, L.A., Yanez, C., Gonzalez, M., Lobos, S., Smalla, K., Seeger, M., 2011. Characterization of the metabolically modified heavy metal-resistant *Cupriavidus metallidurans* strain MSR33 generated for mercury bioremediation. PLoS One 6, e17555. <https://doi.org/10.1371/journal.pone.0017555>
- Rosas, I., Salinas, E., Martinez, L., Cruz-Cordova, A., Gonzalez-Pedrajo, B., Espinosa, N., Amabile-Cuevas, C.F., 2015. Characterization of Escherichia coli Isolates from an Urban Lake Receiving Water from a Wastewater Treatment Plant in Mexico City: Fecal Pollution and Antibiotic Resistance. Curr. Microbiol. 71, 490–495. <https://doi.org/10.1007/s00284-015-0877-8>
- Rozas, O., Contreras, D., Mondaca, M.A., Perez-Moya, M., Mansilla, H.D., 2010. Experimental design of Fenton and photo-Fenton reactions for the treatment of ampicillin solutions. J. Hazard. Mater. 177, 1025–1030. <https://doi.org/10.1016/j.jhazmat.2010.01.023>
- Rozas, O., Vidal, C., Baeza, C., Jardim, W.F., Rossner, A., Mansilla, H.D., 2016. Organic micropollutants (OMPs) in natural waters: Oxidation by UV/H₂O₂ treatment and toxicity assessment. Water Res. 98, 109–118. <https://doi.org/10.1016/j.watres.2016.03.069>
- Sá, L.L.C. de, Fonseca, E.L. da, Pellegrini, M., Freitas, F., Loureiro, E.C.B., Vicente, A.C.P., 2010. Occurrence and composition of class 1 and class 2 integrons in clinical and environmental O1 and non-O1/non-O139 *Vibrio cholerae* strains from the Brazilian Amazon. Mem. Inst. Oswaldo Cruz 105, 229–232.
- Salloto, G.R.B., Cardoso, A.M., Coutinho, F.H., Pinto, L.H., Vieira, R.P., Chaia, C., Lima, J.L., Albano, R.M., Martins, O.B., Clementino, M.M., 2012. Pollution impacts on bacterioplankton diversity in a tropical urban coastal lagoon system. PLoS One 7, e51175. <https://doi.org/10.1371/journal.pone.0051175>
- Santamaría, J., Lopez, L., Soto, C.Y., 2011. Detection and diversity evaluation of tetracycline resistance genes in grassland-based production systems in Colombia, South america. Front. Microbiol. 2, 252. <https://doi.org/10.3389/fmicb.2011.00252>
- Santiago-Rodriguez, T.M., Rivera, J.I., Coradin, M., Toranzos, G.A., 2013. Antibiotic-resistance and virulence genes in *Enterococcus* isolated from tropical recreational waters. J. Water Health 11, 387–396. <https://doi.org/10.2166/wh.2013.005>
- Santoro, D.O., Romão, C.M.C.A., Clementino, M.M., 2012. Decreased aztreonam susceptibility among *Pseudomonas aeruginosa* isolates from hospital effluent treatment system and clinical samples. Int. J. Environ. Health Res. 22, 560–570. <https://doi.org/10.1080/09603123.2012.678000>
- Santoro, D.O., Cardoso, A.M., Coutinho, F.H., Pinto, L.H., Vieira, R.P., Albano, R.M., Clementino, M.M., 2015. Diversity and antibiotic resistance profiles of Pseudomonads from a hospital wastewater treatment plant. J. Appl. Microbiol. 119, 1527–1540. <https://doi.org/10.1111/jam.12936>
- Santos, L.V. de S., Meireles, A.M., Lange, L.C., 2015. Degradation of antibiotics norfloxacin by Fenton, UV and UV/H₂O₂. J. Environ. Manage. 154, 8–12. <https://doi.org/10.1016/j.jenvman.2015.02.021>
- Santos, A.F.S., Matos, M., Sousa, A., Costa, C., Nogueira, R., Teixeira, J.A., Paiva, P.M.G., Parpot, P., Coelho, L.C.B.B., Brito, A.G., 2016. Removal of tetracycline from contaminated water by *Moringa oleifera* seed preparations. Environ. Technol. 37, 744–751. <https://doi.org/10.1080/09593330.2015.1080309>

- Sato, J.P.H., Takeuti, K.L., Daniel, A.G.D., Koerich, P.K. V, Bernardi, M.L., de Barcellos, D.E.S.N., 2015. Association between Virulence Factors and Antimicrobial Resistance from Enterotoxigenic *Escherichia coli* Isolated from Pigs with Diarrhea in Brazil. *Acta Sci. Vet.* 43, 1329.
- Saucier, C., Karthickeyan, P., Ranjithkumar, V., Lima, E.C., Dos Reis, G.S., de Brum, I.A.S., 2017. Efficient removal of amoxicillin and paracetamol from aqueous solutions using magnetic activated carbon. *Environ. Sci. Pollut. Res. Int.* 24, 5918–5932. <https://doi.org/10.1007/s11356-016-8304-7>
- Scoaris, D. de O., Colacite, J., Nakamura, C. V, Ueda-Nakamura, T., de Abreu Filho, B.A., Dias Filho, B.P., 2008. Virulence and antibiotic susceptibility of *Aeromonas* spp. isolated from drinking water. *Antonie Van Leeuwenhoek* 93, 111–122. <https://doi.org/10.1007/s10482-007-9185-z>
- Sellera, F.P., Fernandes, M.R., Moura, Q., Souza, T.A., Cerdeira, L., Lincopan, N., 2017. Draft genome sequence of *Enterobacter cloacae* ST520 harbouring blaKPC-2, blaCTX-M-15 and blaOXA-17 isolated from coastal waters of the South Atlantic Ocean. *J. Glob. Antimicrob. Resist.* 10, 279–280. <https://doi.org/10.1016/j.jgar.2017.07.017>
- Serna-Galvis, E.A., Ferraro, F., Silva-Agreto, J., Torres-Palma, R.A., 2017a. Degradation of highly consumed fluoroquinolones, penicillins and cephalosporins in distilled water and simulated hospital wastewater by UV254 and UV254/persulfate processes. *Water Res.* 122, 128–138. <https://doi.org/10.1016/j.watres.2017.05.065>
- Serna-Galvis, E.A., Giraldo-Aguirre, A.L., Silva-Agreto, J., Florez-Acosta, O.A., Torres-Palma, R.A., 2017b. Removal of antibiotic cloxacillin by means of electrochemical oxidation, TiO₂ photocatalysis, and photo-Fenton processes: analysis of degradation pathways and effect of the water matrix on the elimination of antimicrobial activity. *Environ. Sci. Pollut. Res. Int.* 24, 6339–6352. <https://doi.org/10.1007/s11356-016-6257-5>
- Serna-Galvis, E.A., Silva-Agreto, J., Giraldo-Aguirre, A.L., Florez-Acosta, O.A., Torres-Palma, R.A., 2016a. High frequency ultrasound as a selective advanced oxidation process to remove penicillinic antibiotics and eliminate its antimicrobial activity from water. *Ultrason. Sonochem.* 31, 276–283. <https://doi.org/10.1016/j.ultsonch.2016.01.007>
- Serna-Galvis, E.A., Silva-Agreto, J., Giraldo, A.L., Florez-Acosta, O.A., Torres-Palma, R.A., 2016b. Comparative study of the effect of pharmaceutical additives on the elimination of antibiotic activity during the treatment of oxacillin in water by the photo-Fenton, TiO₂-photocatalysis and electrochemical processes. *Sci. Total Environ.* 541, 1431–1438. <https://doi.org/10.1016/j.scitotenv.2015.10.029>
- Siemens, J., Huschek, G., Siebe, C., Kaupenjohann, M., 2008. Concentrations and mobility of human pharmaceuticals in the world's largest wastewater irrigation system, Mexico City-Mezquital Valley. *Water Res.* 42, 2124–2134. <https://doi.org/10.1016/j.watres.2007.11.019>
- Silva, J., Castillo, G., Callejas, L., López, H., Olmos, J., 2006. Frequency of transferable multiple antibiotic resistance amongst coliform bacteria isolated from a treated sewage effluent in Antofagasta, Chile. *Electron. J. Biotechnol.* 9, 533–540. <https://doi.org/10.2225/vol9-issue5-fulltext-7>
- Silva, J., Loyola, P., Galleguillos, J., Rodriguez, Y., Colque-Navarro, P., Mollby, R., Kuhn, I., 2005. [Prevalence of antibiotic resistant *Enterococcus* spp. in waste waters in the north of Chile]. *Rev. Med. Chil.* 133, 1201–1210. <https://doi.org/S0034-98872005001000009>

- Silva, M.E.Z. da, Filho, I.C., Endo, E.H., Nakamura, C.V., Ueda-Nakamura, T., Filho, B.P.D., 2008. Characterisation of potential virulence markers in *Pseudomonas aeruginosa* isolated from drinking water. *Antonie Van Leeuwenhoek* 93, 323–334. <https://doi.org/10.1007/s10482-007-9209-8>
- Simões, G.A.R., Xavier, M.A.S., Oliveira, D.A., Menezes, E. V, Magalhaes, S.S.G., Gandra, J.A.C.D., Xavier, A.R.E.O., 2016. Genetic markers for detection of *Escherichia coli* K-12 harboring ampicillin-resistance plasmid from an industrial wastewater treatment effluent pond. *Genet. Mol. Res.* 15. <https://doi.org/10.4238/gmr.15028528>
- Somensi, C.A., Souza, A.L.F., Simionatto, E.L., Gaspareto, P., Millet, M., Radetski, C.M., 2015. Genetic material present in hospital wastewaters: Evaluation of the efficiency of DNA denaturation by ozonolysis and ozonolysis/sonolysis treatments. *J. Environ. Manage.* 162, 74–80. <https://doi.org/10.1016/j.jenvman.2015.07.039>
- Soto, E., Wang, R., Wiles, J., Baumgartner, W., Green, C., Plumb, J., Hawke, J., 2015. Characterization of Isolates of *Streptococcus agalactiae* from Diseased Farmed and Wild Marine Fish from the U.S. Gulf Coast, Latin America, and Thailand. *J. Aquat. Anim. Health* 27, 123–134. <https://doi.org/10.1080/08997659.2015.1032439>
- Spindler, A., Otton, L.M., Fuentefria, D.B., Corcao, G., 2012. Beta-lactams resistance and presence of class 1 integron in *Pseudomonas spp.* isolated from untreated hospital effluents in Brazil. *Antonie Van Leeuwenhoek* 102, 73–81. <https://doi.org/10.1007/s10482-012-9714-2>
- Stone, D., Davis, M., Baker, K., Besser, T., Roopnarine, R., Sharma, R., 2013. MLST genotypes and antibiotic resistance of *Campylobacter spp.* isolated from poultry in Grenada. *Biomed Res. Int.* 2013, 794643. <https://doi.org/10.1155/2013/794643>
- Teixeira, L.M., Carvalho, M.G., Merquior, V.L., Steigerwalt, A.G., Brenner, D.J., Facklam, R.R., 1997. Phenotypic and genotypic characterization of *Vagococcus fluvialis*, including strains isolated from human sources. *J. Clin. Microbiol.* 35, 2778–2781.
- Tomova, A., Ivanova, L., Buschmann, A.H., Rioseco, M.L., Kalsi, R.K., Godfrey, H.P., Cabello, F.C., 2015. Antimicrobial resistance genes in marine bacteria and human uropathogenic *Escherichia coli* from a region of intensive aquaculture. *Environ. Microbiol. Rep.* 7, 803–809. <https://doi.org/10.1111/1758-2229.12327>
- Trovó, A.G., Nogueira, R.F.P., Aguera, A., Fernandez-Alba, A.R., Sirtori, C., Malato, S., 2009. Degradation of sulfamethoxazole in water by solar photo-Fenton. Chemical and toxicological evaluation. *Water Res.* 43, 3922–3931. <https://doi.org/10.1016/j.watres.2009.04.006>
- Trovó, A.G., Nogueira, R.F.P., Aguera, A., Fernandez-Alba, A.R., Malato, S., 2011. Degradation of the antibiotic amoxicillin by photo-Fenton process--chemical and toxicological assessment. *Water Res.* 45, 1394–1402. <https://doi.org/10.1016/j.watres.2010.10.029>
- Valenzuela, C., Campos, V.L., Yanez, J., Zaror, C.A., Mondaca, M.A., 2009. Isolation of arsenite-oxidizing bacteria from arsenic-enriched sediments from Camarones river, Northern Chile. *Bull. Environ. Contam. Toxicol.* 82, 593–596. <https://doi.org/10.1007/s00128-009-9659-y>

- Vega-Sanchez, V., Latif-Eugenin, F., Soriano-Vargas, E., Beaz-Hidalgo, R., Figueras, M.J., Aguilera-Arreola, M.G., Castro-Escarpulli, G., 2014. Re-identification of *Aeromonas* isolates from rainbow trout and incidence of class 1 integron and beta-lactamase genes. *Vet. Microbiol.* 172, 528–533. <https://doi.org/10.1016/j.vetmic.2014.06.012>
- Vieira, J.M.B.D., Boente, R.F., Rodrigues Miranda, K., Avelar, K.E.S., Domingues, R.M.C.P., Candida de S Ferreira, M., 2006. Decreased susceptibility to nitroimidazoles among *Bacteroides* species in Brazil. *Curr. Microbiol.* 52, 27–32. <https://doi.org/10.1007/s00284-005-0068-0>
- Vieira, R.H.S.D.F., Carvalho, E.M.R., Carvalho, F.C.T., Silva, C.M., Sousa, O. V, Rodrigues, D.P., 2010. Antimicrobial susceptibility of *Escherichia coli* isolated from shrimp (*Litopenaeus vannamei*) and pond environment in northeastern Brazil. *J. Environ. Sci. Health. B.* 45, 198–203. <https://doi.org/10.1080/03601231003613526>
- Villegas-Guzman, P., Silva-Agredo, J., Gonzalez-Gomez, D., Giraldo-Aguirre, A.L., Florez-Acosta, O., Torres-Palma, R.A., 2015a. Evaluation of water matrix effects, experimental parameters, and the degradation pathway during the TiO₂ photocatalytical treatment of the antibiotic dicloxacillin. *J. Environ. Sci. Health. A. Tox. Hazard. Subst. Environ. Eng.* 50, 40–48. <https://doi.org/10.1080/10934529.2015.964606>
- Villegas-Guzman, P., Silva-Agredo, J., Giraldo-Aguirre, A.L., Florez-Acosta, O., Petrier, C., Torres-Palma, R.A., 2015b. Enhancement and inhibition effects of water matrices during the sonochemical degradation of the antibiotic dicloxacillin. *Ultrason. Sonochem.* 22, 211–219. <https://doi.org/10.1016/j.ultsonch.2014.07.006>
- Villegas-Guzman, P., Silva-Agredo, J., Florez, O., Giraldo-Aguirre, A.L., Pulgarin, C., Torres-Palma, R.A., 2017. Selecting the best AOP for isoxazolyl penicillins degradation as a function of water characteristics: Effects of pH, chemical nature of additives and pollutant concentration. *J. Environ. Manage.* 190, 72–79. <https://doi.org/10.1016/j.jenvman.2016.12.056>
- Vinuesa, P., Ochoa-Sanchez, L.E., 2015. Complete Genome Sequencing of *Stenotrophomonas acidaminiphila* ZAC14D2_NAIMI4_2, a Multidrug-Resistant Strain Isolated from Sediments of a Polluted River in Mexico, Uncovers New Antibiotic Resistance Genes and a Novel Class-II Lasso Peptide Biosynthesis Ge. *Genome Announc.* 3. <https://doi.org/10.1128/genomeA.01433-15>
- Xavier, G.R., Martins, L.M. V, Neves, M.C.P., Rumjanek, N.G., 1998. Edaphic factors as determinants for the distribution of intrinsic antibiotic resistance in a *Cowpea rhizobia* population. *Biol. Fertil. Soils* 27, 386–392. <https://doi.org/10.1007/s003740050448>
- Zanella, J.F.P., da Luz, R.B., Fadanelli, R., Figueiró, M.P., Delamare, A.P.L., da Costa, S.O.P., Echeverrigaray, S., 2012. High prevalence of *Aeromonas* spp. in poultry farmers from a rural community of South Brazil. *Asia-Pacific J. Mol. Biol. Biotechnol.* 20, 93–98.
- Zanetti, M.O., Martins, V.V., Pitondo-Silva, A., Stehling, E.G., 2013. Antimicrobial resistance, plasmids and class 1 and 2 integrons occurring in *Pseudomonas aeruginosa* isolated from Brazilian aquatic environments. *Water Sci. Technol.* 67, 1144–1149. <https://doi.org/10.2166/wst.2013.676>

Zarza, E., Alcaraz, L.D., Aguilar-Salinas, B., Islas, A., Olmedo-Alvarez, G., 2017. Complete Genome Sequence of *Bacillus horikoshii* Strain 20a from Cuatro Ciénegas, Coahuila, Mexico. Genome Announc. 5. <https://doi.org/10.1128/genomeA.00592-17>