Table S1. Continents corresponding to colored circles in Figure 2B.

Continent	Country	Color
Asia	China	red
Asia	Pakistan	red
Americas	USA	red
Americas	Canada	red
Europe	United Kingdom	red
Europe	Denmark	red
Europe	Finland	red
Europe	Sweden	red
Europe	Belgium	red
Europe	Germany	red
Oceania	Australia	red
Asia	India	blue
Asia	Korea	blue
Asia	Saudi Arabia	blue
Asia	Bangladesh	blue
Africa	Egypt	blue
Africa	Malaysia	blue
Africa	Japan	green
Asia	Vietnam	green
Asia	Thailand	green
Europe	France	green
Europe	Switzerland	green
Europe	Spain	purple
Europe	Portugal	purple
Asia	Iran	purple
Asia	Turkey	purple
Europe	Italy	purple
Europe	Netherlands	purple
Europe	Norway	purple
South America	Chile	purple

Table S2. Top 10 highly cited papers on AMR research of global aquaculture systems in 2000–2021.

Title of Literature	TC	TC/Year	Type	Reference
Heavy use of prophylactic antibiotics in aquaculture: a growing problem for human and animal health and for the environment	1234	72	Review	[1]
Environmental pollution by antibiotics and by antibiotic resistance determinants	1023	72	Review	[2]
Aquaculture practices and potential human health risks: Current knowledge and future priorities	483	32	Review	[3]
Heavy metal driven co-selection of antibiotic resistance in soil and water bodies impacted by agriculture and aquaculture	456	41	Review	[4]
Management Options for Reducing the Release of Antibiotics and Antibiotic Resistance Genes to the Environment	430	42	Review	[5]
Occurrence of sulfonamide and tetracycline-resistant bacteria and resistance genes in aquaculture environment	388	34	Article	[6]
Occurrence and distribution of antibiotics in coastal water of the Bohai Bay, China: impacts of river discharge and aquaculture activities	301	24	Article	[7]
Multiple Antimicrobial Resistance in Plague: An Emerging Public Health Risk	288	18	Article	[8]
Human Health Consequences of Use of Antimicrobial Agents in Aquaculture	272	19	Review	[9]
Microbial manipulations to improve fish health and production—A Mediterranean perspective	259	21	Review	[10]

Note: TC: total citations; TC/ Year: average citations per year.

Table S3. Thirty papers on AMR research in global aquaculture systems recently published in 2021.

Title	Location	Research Direction
A systematic review on antibiotics misuse in livestock and aquaculture and regulation implications in China	China	Antibiotic misuse and residuals.
The key environmental influencing factors for the change of sediment bacterial community and antibiotics resistance genes in a long-term polluted lake, China	Bayanihan River, China	Antibiotic misuse and residuals.
Antibiotics control in aquaculture requires more than antibiotic-free feeds: A tilapia farming case	southern China	Antibiotic misuse and residuals.
Occurrence of residues of veterinary antibiotics in water, sediment and trout tissue (*Oncorhynchus mykiss*) in the southern area of Lake Titicaca, Peru	Lake Titicaca, Peru	Antibiotic misuse and residuals.
High throughput sequencing reveals the abundance and diversity of antibiotic-resistant bacteria in aquaculture wastewaters, Shandong, China	Shandong, China	Identification of ARGs and ARBs.
Gopalan Krishnan Sivaraman1 *, Vineeth Rajan1, Ardhra Vijayan1, Ravikrishnan Elangovan2, Alison Prendiville3 and Till T. Bachmann4	Kerala, India	Identification of ARGs and ARBs.
Characterization of Pathogenic *Vibrio parahaemolyticus* Isolated From Fish Aquaculture of the Southwest Coastal Area of Bangladesh	Bangladesh	Identification of ARGs and ARBs.
A comprehensive perspective on a *Vagococcus salmoninarum* outbreak in rainbow trout broodstock	Turkey	Identification of ARGs and ARBs.
Genome analysis and antimicrobial resistance characteristics of *Chryseobacterium aquaticum* isolated from farmed salmonids	Turkey	Identification of ARGs and ARBs.
Plasmid-mediated antimicrobial resistance in motile aeromonads from diseased Nile tilapia (*Oreochromis niloticus*)	Kerala, India	Identification of ARGs and ARBs.
Upraising a silent pollution: Antibiotic resistance at coastal environments and transference to long-distance migratory shorebirs	Chile	Identification of ARGs and ARBs.
Antibiotic resistance of culturable heterotrophic bacteria isolated from shrimp (*Penaeus vannamei*) aquaculture ponds	Andhra Pradesh, India	Identification of ARGs and ARBs.
Spatiotemporal variations and source tracking of antibiotics in an ecological aquaculture farm in Southern China	Guangdong, China	Antibiotic misuse and residuals; the relationship among environmental variables, antibiotic residuals, and ARGs.
Antibiotic resistance genes and mobile genetic elements in a rural river in Southeast China: Occurrence, seasonal variation and association with the antibiotics	Taige Canal, China	Antibiotic misuse and residuals; the relationship among environmental variables, antibiotic residuals, and ARGs.
Monitoring of antimicrobial resistance genes in the spotted sea bass (*Lateolabrax maculatus*): Association with the microbiome and its environment in aquaculture ponds	Guangdong, China	Identification of ARGs and ARBs; the relationship among environmental variables, antibiotic residuals, and ARGs.
Virulotyping and genetic diversity of Aeromonas hydrophila isolated from Nile tilapia (*Oreochromis niloticus*) in aquaculture farms in Egypt	Egypt	Identification of ARGs and ARBs; the relationship among environmental variables, antibiotic residuals, and ARGs.
Environmental antimicrobial resistance is associated with faecal pollution in Central Thailand's coastal aquaculture region	Bangkok, Thailand	Antibiotic misuse and residuals; identification of ARGs and ARBs; the relationship among

		environmental variables, antibiotic residuals, and ARGs.
Responses of sediment resistome, virulence factors and potential pathogens to decades of antibiotics pollution in a shrimp aquafarm	Ningbo, China	Antibiotic misuse and residuals; identification of ARGs and ARBs; the relationship among environmental variables, antibiotic residuals, and ARGs.
Characteristics of bacterial community and ARGs profile in engineered goldfish tanks with stresses of sulfanilamide and copper	China	Antibiotic misuse and residuals; identification of ARGs and ARBs; the relationship among environmental variables, antibiotic residuals, and ARGs.
Antibiotic resistant bacteria and genes in shrimp aquaculture water: Identification and removal by ferrate (VI)	Thailand	Antibiotic misuse and residuals; identification ARGs and ARBs; measures: Fe (VI) removes antibiotics, ARBs, and ARG.
Removal of antibiotic resistance genes and inactivation of antibiotic-resistant bacteria by oxidative treatments	China	Measures: high chlorine concentrations could efficiently remove ARGs.
Ozone nanobubble treatments improve survivability of Nile tilapia (*Oreochromis niloticus*) challenged with a pathogenic multidrug-resistant *Aeromonas hydrophila*	China	Measures: ozone nanobubbles (NBO3) reduced concentrations of pathogenic bacteria.
Implementation of a constructed wetland for the sustainable treatment of inland shrimp farming water	Viet Nam	Measures: constructed wetlands with the horizontal subsurface flow as a water treatment filter.
Actinonin resistance of pathogenic *Vibrio anguillarum* in aquaculture	China	Measures: the combined use of an anaerobic-respiratory inhibitor and an antibiotic to treat ARBs.
Screening of intestinal probiotics and the effects of feeding probiotics on the digestive enzyme activity, immune, intestinal flora and WSSV resistance of *Procambarus clarkii*	China	Measures: *Bacillus amyloliquefaciens* as a probiotic.
Probiotic *Bacillus safensis* NPUST1 Administration Improves Growth Performance, Gut Microbiota, and Innate Immunity against *Streptococcus iniae* in Nile tilapia (*Oreochromis niloticus*)	Pingtung, China	Measures: *Bacillus safensis* NPUST1 as a probiotic.
The *Roseobacter-Group* Bacterium *Phaeobacter* as a Safe Probiotic Solution for Aquaculture	Denmark	Measures: *Phaeobacter inhibens* as a probiotic
Effects of Dietary Mannan Oligosaccharides on Non-Specific Immunity, Intestinal Health, and Antibiotic Resistance Genes in Pacific White Shrimp *Litopenaeus vannamei*	China	Measures: dietary mannan oligosaccharides (0.08%) can decrease ARGs and MGEs.
Effectively reducing antibiotic contamination and resistance in fishery by efficient gastrointestine-blood delivering dietary millispheres	China	Measures: antibiotic-laden dietary milli spheres reduce antibiotic contamination in water and sediment.
Effects of dietary hydrolyzable tannins on growth performance, antioxidant capacity, intestinal microflora and resistance against Vibrio parahaemolyticus of juvenile Pacific white shrimp, *Litopenaeus vannamei* (Boone, 1931)	China	Measures: tannins against *Vibrio parahaemolyticus*.

Note: ARGs: antibiotic resistance genes; ARBs: antibiotic resistance bacteria.

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