

THE USE OF ANTIMICROBIALS IN ASIAN AQUACULTURE: AIMS OF THE EU-ASIARESIST PROJECT

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Antibiotic usage in aquaculture, as in other areas of agriculture, is generally considered to be entirely legitimate and carefully managed. Even so, due to the means of delivery to the farmed species, high antibiotic levels can occur in the water that can lead to antibiotic resistance development in bacteria. Moreover, the illegal use of antibiotics has been documented, as recently publicised in the rejection of Asian aquaculture products by the European Union (EU). In these cases, the antibiotic chloramphenicol, which is banned for use in the aquaculture producing countries of Asia and South East Asia (SEA), was found in farmed shrimp. Chloramphenicol is a particularly important antibiotic that is generally reserved for the treatment of central nervous system infections, and some highly contagious and potentially epidemic diseases such as typhoid in humans and non-food producing animals.

In these recent export cases, the importation of some Asian aquaculture products were banned as residues of chloramphenicol were detected. Low concentrations of chloramphenicol may be toxic or carcinogenic for humans. Another potential risk to the consumer is that low levels of antibiotics in the food could lead to the development of antibiotic resistance in bacteria that are carried by the people consuming the products. In addition, the presence of the antibiotics in aquaculture products indicates their use on the farm, with the consequent risk that antibiotic resistance may develop and disseminate in the aquatic environment. The selection or acquisition of antibiotic resistance in human bacterial pathogens may become a risk to farm workers and handlers of the farm products in preparation for the market. Furthermore, if the resistance arises in pathogens of the species that is being farmed, the antibiotic will cease to be of any therapeutic value to the farmer, whether its use is legal or illegal.

Therefore, the project "Hazard Analysis of Antibiotic Resistance Associated with Asian Aquaculture Environments" (ASIARESIST) was developed by five international collaborative research institutions and funded by the European Commission through the Framework 5 Program (ICA4-CT-2001-10028) to assess the extent of antibiotic resistance in the aquaculture environment in SEA, the potential for transfer of antibiotic resistance from the aquaculture environment to the broad public environment and identification of critical control points (CCP) where SEA fish farmers could apply monitoring systems to prevent or eliminate antibiotic resistance.

Specifically this involved completing the following tasks:

- Developing standard operating procedures for the sampling of chloramphenicol resistant bacteria from diverse geographical and aquaculture backgrounds in Malaysia, Thailand and Vietnam.
- Collecting descriptive and taxonomic data for each antibiotic-resistant bacterial isolate and enter into a project database.
- Assessing the antibiotic susceptibility of each bacterial isolate.
- Evaluating the genetic relationships among the strain collection by applying genotypic techniques.
- Determining the distribution of resistance genes among the resistant isolates.
- Assessing the transferability of antibiotic resistance between aquatic and laboratory isolates.
- Developing a global database to collect project data in a standard format.

-Producing guidelines for monitoring transferable antibiotic resistance at aquaculture sites, and internet-accessible strategies for the implementation of hazard analysis and CCP ecosystem management.