Genetics and Aquaculture

In common with all plants and animals that are exploited by humans, the biodiversity of fish is compromised by overexploitation and habitat modification (including pollution).

Moreover, germplasm transfers—intentional and accidental—have caused substantial genetic changes in numerous populations of fishes, especially those of freshwater species. Such impacts can only be understood with a thorough knowledge of the genetics of fish populations, both in captivity and in open waters.

The study of genetics in aquaculture has produced an extensive body of data such as karyotypes, electrophoretic data, heritability values from selection and genetic improvement studies, and molecular genetic data. These data are scattered widely throughout the literature and are sometimes in different formats, hindering comparisons.

FishBase provides species to species links GenBank for up-to-date information on fish genomes and nucleotides and further links will be explored to other sources of information on the molecular genetics of fish in aquaculture research and development.

The following FishBase tables were designed to bring together, in a standardized format, the categories of information on fish genetics in aquaculture that have been its focus to date. To support the acquisition, storage and use of knowledge on fish genetics in aquaculture, data have been divided into four areas:

- GENETICS - presenting species-specific features such as chromosome number and morphology, sex-determining mechanism, genetic markers and cellular DNA contents;
- ELECDAT - presenting, for a studied population, the different studies, loci, observed allele frequencies and related statistics;
- GENEDAT - presenting heritability values and responses to selection;
- STRAINS - presenting key information on cultured strains of tilapia and carp such as the source and size of the founder stock, distinctive trait(s), effective breeding number, etc.

Information relevant to aquaculture is provided in the following tables:

- CULTSYS - presenting information on culture performance under various scenarios;
- CULTSPEC - a sub-table of the one above, to accommodate species-specific information in multi-species systems;
- DISREF - providing information on common fish diseases; and
- DISEASES - recording cases of disease outbreak.
- The following sections provide details on each of these tables.

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