Shore Fishes of the Tropical Eastern Pacific

SHOREFISHES

of the

Tropical Eastern Pacific

D. Ross Robertson and Gerald R. Allen

Spanish Translation: Myrna López, Juan L. Maté y Rodrigo Rojas

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Software for the Sciences

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SHOREFISHES OF THE TROPICAL EASTERN PACIFIC: AN INFORMATION SYSTEM

December, 2002

D Ross Robertson Smithsonian Tropical Research Institute

Gerald R Allen Conservation International

Software System

Kim F Navin Vagabond Odyssey

This system employs an intuitive graphical user interface to provide intensive query and analysis capabilities through an integrated suite of programs that link fish images, data on biology and zoogeography, and low-level GIS information. It uses a 32 bit (MS Windows2000/NT) platform. It is designed to run under Windows 95 or later MS operating systems, or Windows NT 4.0 with Service Pack 3.The system is generic, and readily adaptable to other groups of organisms in other regions.

Requirements

A PC with at least a 500MHz processor; 64MB of RAM; a screen resolution of at least 1024X768. Installation of the entire system requires 750MB of hard disc space.

Scope

This system combines two capabilities: (i) A comprehensive **interactive identification guide** for almost 1,200 coastal fishes in a biogeographic region with one of the highest rates of endemism in the world (80% of the resident inshore tropical fishes). (ii) An **interactive research tool** that allows **analyses of faunal structure** at varying spatial scales, using species-level databases on zoogeography and biology.

Dual language interfaces

The single CD-ROM includes **separate, full-capability English and Spanish interfaces**.

Geographic and faunal coverage

This work covers **1,195 species** (in 475 genera and 133 families) of shallow-living (<100m depth) coastal and near-shore pelagic species known from the **tropical eastern Pacific (TEP)**. That region includes the continental shoreline extending from southern Baja (Mexico), through the lower and central Gulf of California and southward to Cabo Blanco (northern Peru), as well as 5 oceanic islands and island groups (the Revillagigedos, Clipperton, Cocos, Malpelo and the Galapagos). This region includes the coastlines of 10 central and south American countries: Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Ecuador, and Peru.

CONTENTS AND ANALYTICAL FEATURES

General information

This provides information on the coverage of the system, and sections on work on the systematics of fishes in the region, the zoogeography, biology and ecology of the regional fauna; as well as a description of the system's characteristics, and a **user-guide**.

Information on fish taxa

Information on the members of the fauna is provided through interlinked species, genus and family pages. Genera and species are ordered alphabetically within each of the families, which are systematically arranged. Taxon pages can be accessed by (i) ***browsing*** through each level, (ii) from within an ***expandable systematic tree*** (options include alphabetic or systematic ordering, use of common or scientific names), (iii) from within a ***"Book" mode*** (species within genera within families), or (iv) selection of taxa from ***pull-down lists*** of species, genera and families.

Taxon pages:

Each **Family and Genus page** includes: a brief introduction to the systematics, biology and distribution of the family; a ***text description*** of distinguishing morphological features; a ***database map*** of the taxon's range-limits distribution in the TEP (assembled on-the-fly from distributions of component species); a list of component genera and species with links to their pages; an ***image of a representative species*** that has a ***key-feature overlay*** indicating diagnostic features of the taxon; a ***compare similar taxa*** feature that provides links to the pages of taxa with similar morphology.

Species pages follow the same format as genus and family pages. In addition they include multiple ***images of dissimilar life-stages*** (e.g. juvenile, female, male, color morphs); a ***simultaneous comparison of similar species*** feature that provides images (with key-feature overlays) of up to 6 species designated as similar by the authors. ***Species' attribute data*** in the databases can also be accessed from species pages; these include data on systematics, zoogeographic characteristics (distribution within and outside the region, residency), maximum size, feeding group, diet, depth range, habitat use (salinity, types of substrata, Fishbase habitats) and reproductive mode.

"What-fish-is-that" engine

This tool facilitates identification or unfamiliar fishes by both scientific and general users through 4 independent features:

Find-a-fish: the user can choose among any or all of the following in any order (with the ability to backup steps) - ***location*** (at varying spatial scales on a database map), ***characteristics of the fish*** (shape, color pattern, size) and of ***its habitat*** (depth, salinity, bottom type etc). Search results are linked to images and to species pages.

Interactive keys: Illustrated stepwise keys are provided for the genera and species in the two most speciose families in the fauna: Gobiidae (88 species in 27 genera) and Sciaenidae (78 species in 25 genera). Search results link to genus and species pages.

Taxon-image comparisons: This allows simultaneous comparison of images of up to 6 families, genera or species selected from pull-down lists. Resultant images are linked to taxon pages.

Common-name search: Searches can be made for families, genera and species from pull-down lists of common names (at species, genus and family levels), with results linked to taxon pages.

Maps and Lists Engine

This engine includes 4 features:

Range-map comparisons: This provides overlaid displays of the regional-ranges of up to 5 taxa (species, genera or families, or a mixture thereof) selected from pull-down lists.

Construction of simple faunal lists: Exportable/printable **family/genus/species lists** can be generated for locations at scales ranging from individual islands or sections of coastline, through countries and provinces to the entire TEP. Lists can be arranged alphabetically or systematically. They include both single-location lists and lists of taxa found or not found at two locations. ***Species lists*** can also be constructed using a combination of location plus single species' attributes.

Construction of endemism X attribute species lists: Exportable location lists can be generated using a combination of one category of endemism plus a category of any attribute.

Regional patterns of species richness: This provides maps with color-coded overlays of patterns of variation in species richness throughout the region, including absolute ***richness of individual families*** and ***richness of species sharing a single attribute***. These are assembled on-the-fly from species-range maps in the database. Location lists (alphabetic or systematic ordering) are available from the richness maps.

Searches of databases on biological and zoogeographic attributes of species

Users can query the databases in three ways:

Simple questions: Exportable lists are generated of members of genera and families, and of species in the regional fauna that share single attributes. Listed names are linked to taxon pages.

Complex questions: Exportable lists are generated of species in the regional fauna that share combinations of 2 or more attributes.

Generate new questions: Users familiar with the database structure and SQL can modify existing inbuilt queries to generate new ones.

Library

The library database includes ***1,013 citations***. These cover primarily the systematics of the fauna but also include references relating to zoogeography, ecology and evolution. ***Exportable lists can be assembled for individual families, genera and species, and for authors, dates, sources***, or from a scrollable list of the entire, alphabetically arranged bibliography

Interactive Glossary

A basic glossary is provided that employs **images** + text explanations of ***233 scientific terms*** relating primarily to morphological characteristics of fishes used in their identification.

CLOFTEP

This **Checklist of fishes of the tropical eastern Pacific**, which is an independent unit in the CD, uses a book-style database interface to provide information on the systematics of some 1,400 species of fishes and access to its library. This checklist was assembled by Melvin Wilson.

Contributors and Credits

Major contributors to information presented on each family are noted on family pages.
All images are accompanied by appropriate ownership credits, with an email contact.

Images

The image database incorporates ***2,852 images.*** These include ***2,202 color photographs*** that cover ***82% of the species in the fauna***.

A screen-saver presents the color images in a randomized order.