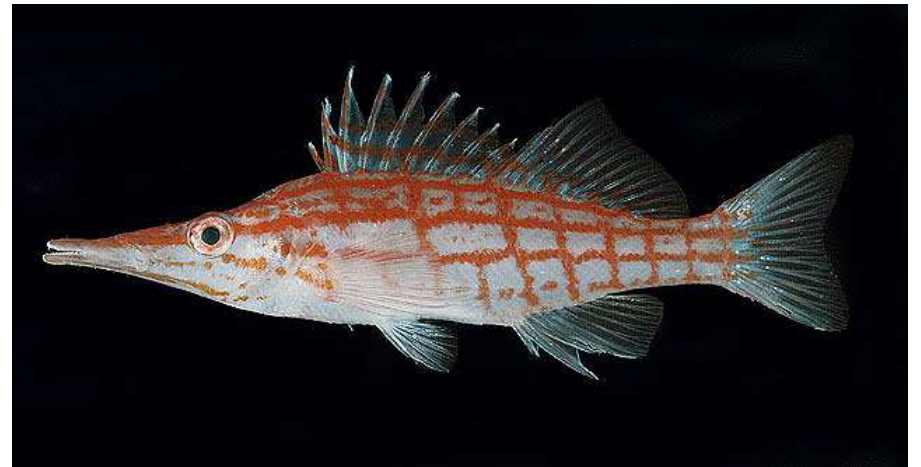


Getting Collections Ready for Digitization: Fishes and a Tale of Two Bar Codes

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J.E. Randall

The University of Guam Marine Laboratory's Fish Collection

- **Collections during expeditions, research projects, and contract work (mid-1960s to present)**
- **Guam, northern and southern Mariana Islands**
- **Federated States of Micronesia (Kosrae, Pohnpei, Chuuk and Yap states)**
- **Palau Archipelago**
- **Other localities in Indo-West Pacific Region**

The University of Guam Marine Laboratory's Fish Collection

- **Collections used to number over 1,000 lots**
- **Poor support and curation has resulted in the loss of nearly 40% of specimens**
- **Many handwritten labels on printed data labels**
- **Loss of field notebooks**
- **Loss of NSF-funded dedicated facility**
- **Remaining collection housed in a small facility on main campus that is not well-suited for this task**
- **Bar Code laboratory housed in a separate facility**
- **Funding sources not consistent previously**

An Opportunity to Rebuild: The Bar Code of Fish Life Project

- **New collections of fishes for Bar Code**
- **Initial funding from NOAA/NMFS**
- **Some additional funding from the Department of Defense (two separate projects)**
- **Guam and Saipan (Commonwealth of the Northern Mariana Islands)**
- **Inshore, deep slope, pelagic fisheries species**
- **Additional collections via NOAA research cruises in the Mariana Islands (2014)**
- **Additional collections by UOGML that include insular freshwater and marine/freshwater invasive fishes**
- **Linkages to habitat and behavioral data including video**

UOGML and NOAA Bar Code Project Tasks

- **Digitize and image UOGML fish collection**
- **Link species to collection maps**
- **Link species to representative images of each**
- **Incorporate UOGML and NOAA Fish Bar Code data including images and maps**
- **Process new fishes collected in upcoming NOAA cruises in the Marianas (2014)**
- **Develop an implement new sample tagging protocol utilizing digital bar code identifiers**
- **Link fish collections, patterns distribution with habitat data to create GIS maps for individual species and for fish assemblages**
- **Link to IUCN Red List status**
- **Create online access**
- **Secure additional funds and promote sustainability**

University of Guam Marine Laboratory

Bar Code of Fishes Laboratory



Field Photograph: Deep Reef Species

(Courtesy of Eric Cruz, NOAA)



Shallow Reef: Labridae (Wrasses)



Bar Code Tissue and Photo Data

BU Fin clip code	BU Fin Clip storage	Photo code	Accession date	Date Stored	Entry	Comments
UG-NMFS-00001B	EtOH95	UG-NMFS-P-000001	2012 03 19	2012 03 23	MKH	
UG-NMFS-00002B	EtOH95	UG-NMFS-P-000002	2012 03 20	2012 03 23	MKH	Missing Sex/Phase
UG-NMFS-00003B	EtOH95	UG-NMFS-P-000003	2012 03 20	2012 03 23	MKH	
UG-NMFS-00004B	EtOH95	UG-NMFS-P-000004	2012 03 20	2012 03 23	MKH	Collection Number??
UG-NMFS-00005B	EtOH95	UG-NMFS-P-000005	2012 03 20	2012 03 23	MKH	Collection Number??
UG-NMFS-00006B	EtOH95	UG-NMFS-P-000006	2012 03 20	2012 03 23	MKH	Collection Number??
UG-NMFS-00007B	EtOH95	UG-NMFS-P-000007	2012 03 20	2012 03 23	MKH	Missing Sex/Phase
UG-NMFS-00008B	EtOH95	UG-NMFS-P-000008	2012 03 20	2012 03 23	MKH	Missing Sex/Phase
UG-NMFS-00009B	EtOH95	UG-NMFS-P-000009	2012 03 20	2012 03 23	MKH	Missing Sex/Phase
UG-NMFS-000010B	EtOH95	UG-NMFS-P-000010	2012 03 20	2012 03 23	MKH	Collection Number??
UG-NMFS-000011B	EtOH95	UG-NMFS-P-000011	2012 03 20	2012 03 23	MKH	
UG-NMFS-000012B	EtOH95	UG-NMFS-P-000012	2012 03 20	2012 03 23	MKH	
UG-NMFS-000013B	EtOH95	UG-NMFS-P-000013	2012 03 20	2012 03 23	MKH	
UG-NMFS-000014B	EtOH95	UG-NMFS-P-000014	2012 03 20	2012 03 23	MKH	Missing Sex/Phase
UG-NMFS-000015B	EtOH95	UG-NMFS-P-000015	2012 03 20	2012 03 23	MKH	
UG-NMFS-000016B	EtOH95	UG-NMFS-P-000016	2012 03 20	2012 03 23	MKH	Missing Sex/Phase
UG-NMFS-000017B	EtOH95	UG-NMFS-P-000017	2012 03 20	2012 03 23	MKH	
UG-NMFS-000018B	EtOH95	UG-NMFS-P-000018	2012 03 20	2012 03 23	MKH	Missing Sex/Phase
UG-NMFS-000019B	EtOH95	UG-NMFS-P-000019	2012 03 20	2012 03 23	MKH	Missing Sex/Phase

New Frontiers: The NOAA O.E. Sette Cruises to the Mariana Islands

- **Day and night sampling of pelagic, deep slope, and offshore bank habitats**
- **Inshore and mid-water species**
- **Tissue sampling**
- **Georeferencing (maps, depths, elevations, etc.)**
- **Imaging**
- **Voucher and photo-vouchers**
- **Linkages to life history data collection**
- **Use of a standardized data base for all forms of data**
- **Provide online access**
- **Need for quick processing while collecting**

NOAA photograph



Rapid Processing: Use of a Different Bar Code Process

- **Digital Bar Code label tagging of voucher specimens**
 - Specimens tagged with unique bar code tag
 - Tag code linked directly to data collection (tablet)
 - Linking tag code to images
 - Subsequent tag scanning links specimen to data collection information, plus tissue, images, life history and habitat data
 - Link tag data to specimen storage with bar code tag on storage container
- **Improved imaging for photo-vouchers**
- **Linking life history sampling with tissue sampling**
- **Linking habitat data with species distribution patterns**

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