

Fishes collected during the Victor Hensen Costa Rica Expedition (1993/1994)*

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Abstract: A list is presented of 242 species of fishes taken in the Golfo de Nicoya, Golfo Dulce and on the Pacific continental shelf of Costa Rica. The specimens were collected using dredges and bottom trawls during December 1993 and February 1994. The Golfo Dulce revealed the lowest diversity with only 75 species represented; 118 species were collected in the Golfo de Nicoya and 129 species in offshore waters. It is presumed that low fish diversity in Golfo Dulce is due to the deep, unproductive waters in that embayment. The checklist includes presence-absence data for each locality.

Key words: checklist, biodiversity, fishes, estuaries, Pacific Ocean.

This report contains the final species identifications of fishes collected during the RV Victor Hensen Costa Rica Expedition. The preliminary cruise report (Wolff & Vargas 1994) grouped all collections into three general localities: Golfo Dulce, Golfo de Nicoya and the Bahía Coronado region. We chose to restrict the gulf fishes as those species found only in stations occurring inside each gulf. Fish species taken in stations made outside the gulf limits are treated with the species collected off the Bahía Coronado region and jointly called "offshore" species. These offshore collections were made over a wide range of depths (20 to 328 m).

Several studies, (Bartels *et al.* 1983 and Bartels *et al.* 1984) have shown how the Golfo de Nicoya fish fauna is distributed within the gulf and how diversity and biomass is related throughout its length. From the outset it was clear that regarding the trawl fishery, fish diversity in Golfo Dulce is considerably less (75 species vs 118 species) than that in Golfo

de Nicoya. The total number of species taken in offshore waters (129) was greater than that of either gulf.

Table 1 is based entirely on species collected in dredges and benthic trawls, although sampling to a lesser degree surface and midwater species found in the water column. Those species commonly referred to as "reef fishes" associated with rock or coral reef structures were not sampled during this expedition. Certain other shallow water mud flat and tide pool species were not sampled. Hence, the total fish fauna for each of the three general localities is considerably greater than that collected solely utilizing soft-bottom sampling gear.

Fishes of the families Ariidae, Engraulidae, Pristigasteridae and Sciaenidae were found almost exclusively in the Golfo de Nicoya. The species composition of Golfo Dulce consists principally of eurytopic species, that is widely tolerant species, which are also found in the Golfo de Nicoya as well as offshore. These species which were found in all three localities were most commonly found in the families Carangidae, Cynoglossidae, Paralichthyidae, Scorpaenidae, Serranidae, Synodontidae, Tetraodontidae and Triglidae. No species taken

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only in Golfo Dulce during this expedition is unique to the gulf, since all have been collected on other occasions from outside the gulf.

TABLE I

Occurrence of 242 species of fishes in the Golfo de Nicoya, Golfo Dulce and on the Pacific continental shelf of Costa Rica, respectively

O: Offshore N: G. Nicoya D: G. Dulce

Species	O	N	D	Species	O	N	D
ALBULIDAE				<i>Ophisoma macrurum</i>	X	-	-
<i>Albula nemoptera</i>	-	X	X	<i>Ophisoma prorigerum</i>	X	X	-
ANTENNARIIDAE				<i>Rhynchoconger nitens</i>	X	X	-
<i>Antennarius avalonis</i>	X	-	X	CYNOGLOSSIDAE			
ARGENTINIDAE				<i>Symphurus atramentatus</i>	X	X	X
<i>Argentina aliciae</i>	X	X	-	<i>Symphurus callopterus</i>	X	X	X
ARIIDAE				<i>Symphurus chabanaudi</i>	-	X	-
<i>Arius dasycephalus</i>	-	X	-	<i>Symphurus elongatus</i>	X	X	X
<i>Arius kessleri</i>	-	X	-	<i>Symphurus gorgonae</i>	X	X	X
<i>Arius osculus</i>	-	X	-	<i>Symphurus leei</i>	X	X	X
<i>Arius platypogon</i>	X	X	-	<i>Symphurus melanurus</i>	-	X	-
<i>Arius sp. A</i>	-	X	-	<i>Symphurus melasmatotheca</i>	X	-	X
<i>Arius sp. B</i>	-	X	-	<i>Symphurus oligomerus</i>	X	X	-
<i>Cathorops furthii</i>	-	X	-	<i>Symphurus undecimlatus</i>	X	X	-
<i>Cathorops steindachneri</i>	-	X	-	<i>Symphurus williamsi</i>	-	X	-
<i>Cathorops tuya</i>	-	X	-	DASYATIDAE			
<i>Sciadichthys troschelii</i>	-	X	-	<i>Dasyatis longus</i>	X	X	X
<i>Selenaspis dowii</i>	-	X	-	<i>Himantura pacifica</i>	-	X	X
ATELEPODIDAE				DIODONTIDAE			
<i>Guentherus altivela</i>	X	-	-	<i>Diodon holocanthus</i>	-	-	X
BALISTIDAE				<i>Diodon hystrix</i>	-	X	-
<i>Balistes polylepis</i>	X	-	-	ENGRAULIDIDAE			
<i>Pseudobalistes naufragium</i>	-	-	X	<i>Anchoa exigua</i>	X	-	-
BATRACHOIDIDAE				<i>Anchoa ischana</i>	-	X	X
<i>Batrachoides sp.</i>	-	X	-	<i>Anchoa lucida</i>	-	X	-
<i>Porichthys greenei</i>	X	X	X	<i>Anchoa nasus</i>	-	X	-
<i>Porichthys margaritatus</i>	X	X	X	<i>Anchoa starksi</i>	-	X	-
BOTHIDAE				<i>Anchoa walkeri</i>	-	X	-
<i>Engyophrys sanctilarentii</i>	X	X	X	<i>Anchovia macrolepidota</i>	-	X	-
<i>Monolene danae</i>	X	-	-	<i>Cetengraulis mysticetus</i>	-	X	-
<i>Monolene maculipinna</i>	X	-	-	EPHIPPIDAE			
<i>Perissias taeniopterus</i>	X	-	-	<i>Chaetodipterus zonatus</i>	-	X	-
BREMACEROTIDAE				<i>Parapsetus panamensis</i>	-	X	-
<i>Bregmaceros bathymaster</i>	X	X	X	FISTULARIIDAE			
CALLIONYMIDAE				<i>Fistularia commersoni</i>	-	-	X
<i>Synchiropus atrilabiatus</i>	X	X	-	GERREIDAE			
CARANGIDAE				<i>Diapterus aureolus</i>	-	X	X
<i>Caranx caballus</i>	-	X	-	<i>Diapterus peruvianus</i>	-	X	X
<i>Caranx caninus</i>	-	X	X	<i>Eucinostomus argenteus</i>	X	X	X
<i>Caranx otrynter</i>	X	X	X	<i>Eucinostomus currani</i>	-	X	-
<i>Caranx speciosus</i>	X	X	-	<i>Eucinostomus gracilis</i>	X	X	X
<i>Caranx vinctus</i>	X	X	X	<i>Gerres cinereus</i>	-	X	-
<i>Hemicaranx leucorus</i>	-	X	-	GOBIESOCIDAE			
<i>Selar crumenophthalmus</i>	X	X	-	<i>Gobiesox milleri</i>	-	X	-
<i>Selene brevoortii</i>	-	X	-	GOBIIDAE			
<i>Selene oerstedii</i>	X	X	X	<i>Bollmania chlamydes</i>	X	X	X
<i>Selene peruana</i>	-	X	X	<i>Bollmania stigmatura</i>	X	X	X
<i>Trachinotus paitensis</i>	X	X	-	<i>Bollmania sp. nov.</i>	X	-	-
CONGRIDAE				<i>Microgobius erectus</i>	X	X	-
<i>Chilochanys labiatus</i>	X	X	-	GOBIOIDIDAE			
				<i>Gobioides peruanus</i>	-	X	-
				HAEMULIDAE			
				<i>Anisotremus dovii</i>	X	X	-
				<i>Anisotremus pacifici</i>	-	X	-
				<i>Haemulon scudderii</i>	-	X	-
				<i>Haemulopsis elongatus</i>	-	X	-
				<i>Haemulopsis leuciscus</i>	-	X	-
				<i>Haemulopsis nitidus</i>	-	X	-
				<i>Pomadasyus macracanthus</i>	-	X	-
				<i>Pomadasyus branickii</i>	X	-	-
				HETERENCHELYIDAE			
				<i>Pythonichthys asodes</i>	-	X	-

Species	O	N	D	Species	O	N	D
LABRIDAE				<i>Syacium cf. longidorsale</i>	X	X	
<i>Decodon melasma</i>	X	-	-	<i>Syacium ovale</i>	-	X	X
<i>Polylepion cruentum</i>	X	-	-	PERISTEDIIDAE			
LOPHIIDAE				<i>Peristedion barbiger</i>	X	X	-
<i>Lophiodes caularis</i>	X	-	-	<i>Peristedion crustosum</i>	X	X	X
<i>Lophiodes spilurus</i>	X	-	-	POLYNEMIDAE			
LUTJANIDAE				<i>Polydactylus approximans</i>	-	X	-
<i>Hoplopagrus guentheri</i>	-	X	-	PRIACANTHIDAE			
<i>Lutjanus argentiventris</i>	-	X	-	<i>Pristigenys serrula</i>	-	X	-
<i>Lutjanus guttatus</i>	X	X	X	PRISTIGASTERIDAE			
<i>Lutjanus peru</i>	-	X	X	<i>Ilisha furthii</i>	-	X	-
MACROURIDAE				<i>Neoopisthopterus tropicus</i>	-	X	-
<i>Coelorinchus scaphopsis</i>	X	-	-	<i>Opisthopterus dovii</i>	-	X	-
<i>Coryphaenoides leucophaeus</i>	X	-	-	<i>Opisthopterus equatorialis</i>	-	X	-
MALACANTHIDAE				<i>Pliosteostoma lutipinnis</i>	-	X	-
<i>Caulolatilus affinis</i>	X	-	-	RAJIDAE			
MERLUCCIIDAE				<i>Raja equatorialis</i>	X	X	-
<i>Merluccius angustimanus</i>	X	-	-	<i>Raja velezi</i>	X	X	X
MORIDAE				RHINOBATIDAE			
<i>Physiculus nematopus</i>	X	X	-	<i>Rhinobatos leucorhynchus</i>	-	X	-
<i>Physiculus rastrelliger</i>	X	X	-	<i>Zapteryx exasperata</i>	X	X	-
MULLIDAE				SCIAENIDAE			
<i>Mulloides dentatus</i>	-	X	-	<i>Bairdiella armata</i>	-	X	-
<i>Pseudupeneus grandisquamis</i>	X	X	X	<i>Cynoscion albus</i>	-	X	-
MURAENESOCIDAE				<i>Cynoscion nannus</i>	X	-	X
<i>Cynoponticus coniceps</i>	-	X	-	<i>Cynoscion phoxocephalus</i>	-	X	-
MURAENIDAE				<i>Cynoscion reticulatus</i>	-	X	-
<i>Gymnothorax equatorialis</i>	X	X	X	<i>Cynoscion squampinnis</i>	-	X	-
<i>Gymnothorax sp. nov.</i>	X	-	-	<i>Cynoscion stolzmanni</i>	-	X	-
<i>Muraena argus</i>	-	-	X	<i>Isopisthus altipinnis</i>	-	X	-
OGCOEPHALIDAE				<i>Larimus acclivis</i>	-	X	-
<i>Zalieutes elater</i>	X	X	X	<i>Larimus pacificus</i>	-	X	-
OPHICHTHIDAE				<i>Menticirrhus nasus</i>	-	X	-
<i>Echiophis brunneus</i>	X	-	-	<i>Menticirrhus panamensis</i>	-	X	-
<i>Myrichthys aspetochirus</i>	X	-	-	<i>Nebris occidentalis</i>	-	X	-
<i>Myrichthys tigrinus</i>	-	X	-	<i>Ophioscion sciera</i>	-	X	-
<i>Ophichthus ramiger</i>	X	X	-	<i>Ophioscion typicus</i>	-	X	-
<i>Ophichthus sp. A</i>	X	-	-	<i>Paralonchurus dumerilii</i>	-	X	-
<i>Ophichthus sp. B</i>	X	X	-	<i>Paralonchurus rathbuni</i>	-	X	-
<i>Ophichthus sp. C</i>	X	-	-	<i>Stellifer chrysoleuca</i>	-	X	-
<i>Ophichthus sp. D</i>	-	X	-	<i>Stellifer furthii</i>	-	X	-
<i>Pseudomyrophis micropinna</i>	-	X	X	<i>Stellifer illecebrosus</i>	-	X	-
OPHIDIIDAE				<i>Stellifer mancorensis</i>	-	X	-
<i>Bronula clarkae</i>	X	X	-	<i>Stellifer oscitans</i>	-	X	-
<i>Lepophidium microlepis</i>	X	-	-	<i>Stellifer zestocarus</i>	-	X	-
<i>Lepophidium negropinna</i>	X	-	-	<i>Umbrina bussingi</i>	X	-	X
<i>Lepophidium prorates</i>	X	X	-	<i>Umbrina xanti</i>	-	X	-
<i>Neobythies stelliferoides</i>	X	-	-	SCOMBRIDAE			
OPISTOGNATHIDAE				<i>Auxis sp.</i>	X	-	-
<i>Opistognathus rhomaleus</i>	X	-	-	<i>Scomber japonicus</i>	-	X	-
PARALICHTHYIDAE				SCORPAENIDAE			
<i>Ancylosetta dendritica</i>	-	X	-	<i>Pontinus furcirhinus</i>	X	X	X
<i>Citharichthys gilberti</i>	X	X	X	<i>Pontinus sierra</i>	X	X	X
<i>Citharichthys platophrys</i>	X	X	X	<i>Pontinus sp. nov.</i>	X	-	-
<i>Cyclosetta panamensis</i>	X	X	-	<i>Scorpaena histrio</i>	X	X	-
<i>Cyclosetta querna</i>	X	X	-	<i>Scorpaena mystes</i>	X	X	-
<i>Etropus crossotus</i>	X	-	-	<i>Scorpaena russula</i>	X	X	X
<i>Etropus peruvianus</i>	-	X	X	SERRANIDAE			
<i>Hippoglossina bollmani</i>	X	X	-	<i>Alphestes multiguttatus</i>	-	X	-
<i>Hippoglossina tetraophthalmus</i>	X	X	-	<i>Diplectrum eumelum</i>	X	X	-
<i>Paralichthys woolmani</i>	X	X	-	<i>Diplectrum euryplectrum</i>	X	X	-
<i>Syacium latifrons</i>	X	X	X	<i>Diplectrum labarum</i>	X	X	X
				<i>Diplectrum macropoma</i>	X	X	X

Species	O	N	D	Species	O	N	D
<i>Diplectrum maximum</i>	X	X	-	<i>Urotrygon rogersi</i>	-	X	-
<i>Diplectrum pacificum</i>	X	X	X	<i>Urotrygon munda</i>	-	X	-
<i>Diplectrum rostrum</i>	X	-	-	<i>Urotrygon nana</i>	-	X	-
<i>Epinephelus acanthistius</i>	X	X	-	SQUATINIDAE			
<i>Epinephelus cifuentesi</i>	-	X	-	<i>Squatina californica</i>	X	-	-
<i>Epinephelus exsul</i>	-	X	-				
<i>Epinephelus niphobles</i>	-	X	-				
<i>Hemanthius peruanus</i>	X	-	-				
<i>Hemanthius signifer</i>	X	X	-				
<i>Paralabrax loro</i>	X	-	-				
<i>Paranthias colonus</i>	-	-	X				
<i>Pikea longilepis</i>	X	-	-				
<i>Pronotoqrammus eos</i>	X	X	X				
<i>Pronotoqrammus multifasciatus</i>	X	-	-				
<i>Rypticus bicolor</i>	-	-	X				
<i>Rypticus nigripinnis</i>	-	X	-				
<i>Serranus aequidens</i>	X	-	-				
<i>Serranus psittacinus</i>	X	X	X				
SOLEIDAE							
<i>Achirus klunzingeri</i>	X	-	-				
<i>Achirus mazatlanus</i>	X	X	X				
<i>Achirus scutum</i>	-	X	X				
<i>Trinectes fonsecensis</i>	-	X	-				
<i>Trinectes</i> sp. nov.	-	X	-				
SPARIDAE							
<i>Calamus brachysomus</i>	X	X	-				
STROMATEIDAE							
<i>Peprilus medius</i>	-	X	-				
<i>Peprilus snyderi</i>	X	X	-				
SYNODONTIDAE							
<i>Synodus evermanni</i>	X	X	X				
<i>Synodus scituliceps</i>	X	X	X				
<i>Synodus sechurae</i>	X	X	X				
TETRAODONTIDAE							
<i>Arothron hispidus</i>	X	X	X				
<i>Sphoeroides annulatus</i>	X	X	X				
<i>Sphoeroides lobatus</i>	X	X	X				
<i>Sphoeroides trichocephalus</i>	-	X	-				
TORPEDINIDAE							
<i>Diplobatis omnata</i>	-	X	X				
<i>Narcine brasiliensis</i>	-	X	X				
<i>Torpedo tremens</i>	X	-	-				
TRIAKIDAE							
<i>Mustelus lunulatus</i>	X	-	X				
TRICHIURIDAE							
<i>Trichiurus nitens</i>	X	X	X				
TRIGLIDAE							
<i>Bellator gymnostethus</i>	X	-	-				
<i>Bellator loxias</i>	X	X	X				
<i>Bellator xenisma</i>	X	X	X				
<i>Prionotus albirostris</i>	X	-	X				
<i>Prionotus horrens</i>	-	X	-				
<i>Prionotus ruscarius</i>	-	X	X				
<i>Prionotus stephanophrys</i>	X	X	X				
<i>Prionotus teaguei</i>	X	X	-				
URANOSCOPIDAE							
<i>Kathetostoma averruncus</i>	X	X	-				
UROLOPHIDAE							
<i>Urolophis halleri</i>	-	-	X				
<i>Urotrygon aspidura</i>	-	-	X				
<i>Urotrygon chilensis</i>	X	X	X				

Evidently the shallow, well-circulated, oxygen-rich waters of the Gulf of Nicoya are appropriate for a much larger variety and biomass of fish than the deeper, anoxic waters of Golfo Dulce. In Golfo Dulce the steep-sided shoreline limits the area of shallow waters available for corbinas, marine catfishes and other such fishes; also productivity is restricted due to the loss of nutrients in the anoxic depths.

Additional information on specific collections made during this expedition will be available on the Internet via Gopher (fowler.acnatsci.org). This service hosts the NEODAT Fish Biodiversity Gopher which contains the Museo de Zoología fish data base including the catalog number (UCR), locality, depth and other data.

RESUMEN

Se presenta una lista de 242 especies de peces del Golfo de Nicoya, el Golfo Dulce y la plataforma continental del Pacífico de Costa Rica. Los especímenes se extrajeron con dragas y redes de fondo en diciembre de 1993 y febrero de 1994. El Golfo Dulce tuvo la menor biodiversidad, con solo 75 especies; hubo 118 en el Golfo de Nicoya y 129 en la plataforma. La baja diversidad en Golfo Dulce podría deberse a sus aguas profundas y de poca productividad.

REFERENCES

- Bartels, C.E., K.S. Price, M.L. Bussing & W.A. Bussing 1983. Occurrence, distribution, abundance, and diversity of fishes in the Gulf of Nicoya, Costa Rica. *Rev. Biol. Trop.* 31: 75-101.
- Bartels, C.E., K.S. Price, M.L. Bussing & W.A. Bussing 1984. Ecological assessment of finfish as indicators of habitats in the Gulf of Nicoya, Costa Rica. *Hydrobiologia* 112: 197-207.
- Wolff, M. & J.A. Vargas (eds.). 1994. R.V. Victor Hensen Costa Rica Expedition 1993/ 1994. Cruise Report. Center for Tropical Marine Ecology (ZMT). Contribution 2. Bremen. 109 p.