

## ***Supplementary material Files S1-S11***

**Photographs of reef fishes from the Revillagigedo National Park (RNP).**

***Name codes for photographer's initials imbedded in images in Files S1-S4.***

**Codes for coauthors and other non-iNaturalist contributors of images.**

AAB Arturo Ayala-Bocos

AME Allison Estape

AGH Andre Hernandez

ADS Alasdair Dunlap-Smith

CAS Carlos Sanchez

CDC Carole Cox

CJE Carlos Estape

EAP Ellie Place

JDH Jeff Haines

JoH Jordan Hollarsmith

KaI Katherine Ilves

LBA Laboratorio de Biología Acuática, Universidad Michoacana

LJR Lee Richter

RLC Robert Cox

SSM Serenity Mitchell

SMR Sara Richter

WiL William Ludt

**Codes for 19 iNaturalist photographers and a list of their 71 species voucher images**

**C = Clarion, RP = Roca Partida, SB = San Benedicto, So = Socorro. Creative Commons licenses indicated for each photographer's images in iNaturalist are indicated.**

**AdN Adnovo** (CC-BY-NC): *Zanclus cornutus* (RP)

**AoA Alboertoalcala** (CC-BY): *Chaenomugil proboscideus* X 2 (C & So); *Bathygobius ramosus longipinnis* (So); *Enchelychore octaviana*, *Echidna nocturna*, *Gobiesox canidens*, *Hemiramphus saltator*, *Heteropriacanthus carolinus*, *Kuhlia mugil*, *Kyphosus vaigiensis*, *Mugil cephalus*, *Naucrates ductor*, *Scarus rubroviolaceus*, *Tylosurus fodiator* (all So); *Microspathodon dorsalis* (C)

**AMiN AngelMendez** (CC-BY-NC): *Thalassoma virens* (RP)

**AMo Andrs Morales** (CC-BY-NC): *Echidna nocturna* (C)

**ArS Arturo\_Santos** (CC-BY-NC): *Prionurus laticlavus* (RP)

**BeN Beavisnail** (CC-BY-NC): *Carcharhinus falciformis*, *Galeocerdo cuvier*, *Gymnothorax dovii* (all So); *Scorpaena mystes* (SB); *Sphyrna lewini*, *Thunnus albacares*, (both So)

**BIO Bioanda** (CC-BY-NC): *Lactoria diaphana* (So)

**CJH Craigjhowe** (CC-BY-NC-ND): *Carcharhinus limbatus*, *Euthynnus lineatus* (both RP)

**HeH Hector Hernandez** (~~hectorhernandez96~~ and **inaturalist: tidechaser96**; (~~CC-BY-NC-~~

~~SA~~ All rights reserved; used with permission): *Acanthurus xanthopterus*, *Alectis ciliaris*, *Bothus leopardinus*, *Chaenomugil proboscideus*, *Echidna nebulosa*, *Lutjanus argentiventris*, *Myrichthys pantostigmus*, *Scarus compressus*, *Seriola rivoliana*, *Sphoeroides lobatus* (all So); *Gymnothorax flavimarginatus*, *Kyphosus ocyurus*, *Kyphosus vaigiensis*, *Labrisomus socorroensis*, *Stegastes*

*leucorus*, *Stethojulis bandanensis*, *Uropterygius macrocephalus* (C); *Calotomus carolinus*,  
*Anisotremus perezponcedeleoni* (RP)

**PMG Petermcgee** (CC-BY-NC) *Thunnus albacares* (C)

**PiN Peter1939** (All rights reserved; used with permission): *Mobula tarapacana*, *Kyphosus*  
*vaigiensis* (both SB)

**SeM Sergiomtz** (CC-BY-NC): *Chaetodon humeralis*, *Diplobatis ommata*, *Kyphosus elegans*,  
*Labrisomus socorroensis*, *Scorpaena mystes*, *Stegates flavilatus* (all So)

**Slb Silvain\_le\_bris** (CC-BY-NC): *Rhincodon typus*, *Thalassoma grammaticum*, ( both RP);  
*Uraspis helvola* (SB)

**SpiN Susannespider** (CC-BY-NC-ND): *Rhincodon typus* (SB); *Seriola rivoliana* (RP)

**SuiN Sulavanderplank** (CC-BY): *Atherinella eriarcha* (C)

**TAP Taopina** (CC-BY-NC): *Bothus mancus*, *Scarus rubroviolaceus* (both RP)

**TRG Trudiegattan** (CC-BY-NC): *Rhincodon typus* (So)

**VBH Victorbach** (CC-BY-NC): *Acanthemblemaria mangognatha*, *Platax teira* (both RP)

**Wet Wetlens** (CC-BY-NC): *Arothron meleagris*, *Canthigaster punctatissima* (both RP);  
*Decapterus mararellus* (So); *Ostracion meleagris*, *Mulloidichthys dentatus* (both RP)

**Total for 4 islands: 468 images; including specimen images of 14 species**

**File S1. 124 Photographs of 123 species of fishes from Clarion Island (including 4  
specimen images of 4 species)**

Plate 1 *Abantennarius sanguineus* to *Chilomycterus reticulatus*

Plate 2 *Chriolepis* sp. to *Hypanus longus*

Plate 3 *Hyporthodus cifuentesii* to *Prionurus laticlavus*

Plate 4 *Pristigenys serrula* to *Zanclus cornutus*

**File S2. 74 Photographs of 74 species of fishes from Roca Partida (including 2 specimen images of 2 species)**

Plate 1 *Acanthocybium solandri* to *Gymnothorax castaneus*

Plate 2 *Gymnothorax dovii* to *Sphyrna lewini*

Plate 3 *Stegastes leucorus* to *Zanclus cornutus*

**File S3. 119 Photographs of 118 species of fishes from San Benedicto Island. (including 2 specimen images of 1 species)**

Plate 1 *Abudefduf troschelii* to *Carcharhinus galapagensis*

Plate 2 *Cephalopholis colonus* to *Hyporthodus cifuentesi*

Plate 3 *Iniistius pavo* to *Rhincodon typus*

Plate 4 *Rypticus courtenayi* to *Zanclus cornutus*

**File S4. 151 Photographs of 151 species of fishes from Socorro Island (including 7 specimen images of 7 species)**

Plate 1 *Abantennarius sanguineus* to *Caranx melampygus*

Plate 2 *Carcharhinus albimarginatus* to *Fowlerichthys avalonis*

Plate 3 *Galeocerdo cuvier* to *Lythrypnus insularis*

Plate 4 *Melichthys niger* to *Scuticaria tigrina*

Plate 5 *Seriola rivoliana* to *Zanclus cornutus*

***File S5. Distinguishing characteristics of *Canthigaster janthinoptera* and *C. punctatissima****

***File S6. Distinguishing characteristics of *Forcipiger flavissimus* and *F. longirostris****

***File S7. Image of an apparent hybrid of *Holcanthus clarionensis* and *H. passer* collected in the RNP***

***File S8. Distinguishing characteristics of scalation of *Myripristis clarionensis* and *M. leiognathus****

***File S9. Distinguishing characteristics of *Priacanthus alalaua* and *Heteropriacanthus carolinus****

***File S10. Distinguishing color patterns of *Halichoeres nicholsi* from the RNP and from elsewhere in the TEP***

***File S11. Distinguishing color patterns of *Lythrypnus dalli* from Baja and *L. cf dalli* from Clarion.***



# File S1: Clarion Island Fish Images Plates 1-4



*Abantennarius sanguineus*

ADS



*Abudefduf troschelii*

CJE



*Acanthemblemaria mangognatha*

AGS



*Acanthurus nigricans*

AME



*Acanthurus triostegus triostegus*

SSM



*Acanthurus xanthopterus*

SSM



*Alphestes immaculatus*

EAP



*Aluterus scriptus*

ADS



*Anisotremus perezponcedeleoni*

Joh



*Antennarius commerson*

ADS



*Apogon atricaudus*

AGH



*Arothron meleagris*

ADS



*Aseraggodes herrei*

AGH



*Atherinella eriarcha*

SuiN



*Aulostomus chinensis*

AGH



*Axoclinus multicinctus*

CJE



*Balistes polylepis*

AGH



*Bodianus diplotaenia*

ADS



*Bothus leopardinus*

SSM



*Bothus mancus*

ADS



*Calotomus carolinus*

SSM



*Cantherhines dumerilii*

ADS



*Canthigaster janthinoptera*

AGH



*Canthigaster punctatissima*

JDH



*Caranx lugubris*

AGH



*Caranx melampygus*

SSM



*Caranx sexfasciatus*

AGH



*Carcharhinus galapagensis*

AME



*Cephalopholis colonus*

SSM



*Cephalopholis panamensis*

AGH



*Chaenomugil proboscideus*

AoA



*Chilomycterus reticulatus*

CJE



# Plate 2



*Chrolepis* sp.

CJE



*Chromis* *alta*



JoH *Cirrhitichthys* *oxycephalus*



ADS *Cirrhitus* *rivulatus*

CJE



*Coryphopterus* *urospilus*

JDH



*Decapterus* *macarellus*

CJE



*Dermatolepis* *dermatolepis*

EAP



*Diodon* *holocanthus*

AGH



*Doryrhamphus* *melanopleura*

JDH



*Echinodermatops* *nebulosa*

AGH



*Elagatis* *bipinnulata*

AGH



*Enchelycore* *octaviana*

EAP



*Echinodermatops* *nocturna*

AMo



*Enneanectes* *exsul*

LJR



*Entomacrodus* *chiostrictus*

LJR



*Epinephelus* *clippertonensis*

AEP



*Epinephelus* *labriformis*

SMR



*Ferdauia* *orthogrammus*

AME



*Fistularia* *commersonii*

SSM



*Forcipiger* *flavissimus*

AEP



*Galeocerdo* *cuvier*

AEP



*Gillellus* *semicinctus*

CJE



*Gobiesox* *canidens*

EAP



*Gymnomuraena* *zebra*

SMR



*Gymnothorax* *dovii*

SSM



*Gymnothorax* *flavimarginatus*

HeH



*Gymnothorax* *panamensis*

LJR



*Halichoeres* *insularis*

LJR



*Halichoeres* *nicholsi*

SSM



*Heteropriacanthus* *carolinus*

ADS



*Holacanthus* *clarionensis*

SSM



*Hypanus* *longus*

AME



# Plate 3



*Hyporthodus cifuentesi*      *JoH Hypsoblennius proteus*      *CJE Iniistius pavo*      *CJE Johnrandallia nigrostris*      SSM



*Kuhlia mugil*      ADS      *Lutjanus argentiventris*      SMR      *Kyphosus elegans*      SMR      *Kyphosus ocyurus*      HeH



*Kyphosus sectatrix*      SSM      *Kyphosus vaigiensis*      HeH      *Labrisomus socorroensis/xanti*      HeH      *Lactoria diaphana*      SSM



*Lutjanus viridis*      SSM      *Lythrypnus cf dalli*      CJE      *Lythrypnus insularis*      AGH      *Melichthys niger*      SSM



*Microspathodon dorsalis*      AoA      *Mobula birostris*      AME      *Mobula thurstoni*      CJE      *Mulloidichthys dentatus*      SMR



*Myrichthys pantostigmus*      AME      *Myripristis berndti*      AEP      *Myripristis clarionensis*      EAP      *Narcine entemedor*      PMG



*Neoniphon suborbitalis*      JDH      *Novaculichthys taeniourus*      JDH      *Ophioblennius steindachneri/clippertonensis*      AGH      *Ostracion meleagris*      JDH



*Pareques species A*      AGH      *Plagiotremus azaleus*      LJH      *Plectrypops lima*      CJE      *Prionurus laticlavus*      EAP



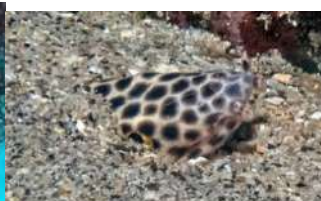
## Plate 4



*Pristigenys serrula*



JoH *Prognathodes falcifer*



JoH *Quassiremus evionthas*



SMR *Quassiremus evionthas* JOH



*Rypticus courtenayi*



JDH *Scarus rubroviolaceus*



ADS *Scorpaena mystes*



ADS *Scorpaenodes xyris* AGH



*Scuticaria tigrina*

EAP



*Seriola rivoliana*

SSM



*Serranus socorroensis*

AME



*Sphoeroides lobatus*

SSM



*Stegastes leucorus*

HeH



*Stegastes redemptus*

SMR



*Stethojulis bandanensis*

HeH



*Sufflamen verres*

AGH



*Synodus lacertinus*

EAP



*Thalassoma grammaticum*

EAP



*Thalassoma lucasanum*

JDH



*Thalassoma purpureum*

AME



*Thalassoma virens*

AGH



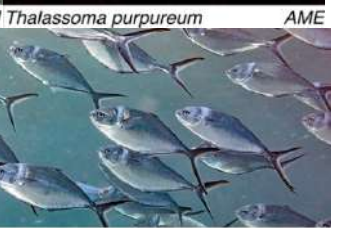
*Thunnus albacares*

PMG



*Tomicodon* sp.

ADS



*Trachinotus stilbe*

ADS



*Trienodon obesus*

LJR



*Tylosurus fodiator*

CJE



*Uropterygius macrocephalus*

HeH



*Xanthichthys mento*

CJE



*Zanclus cornutus*

EAP



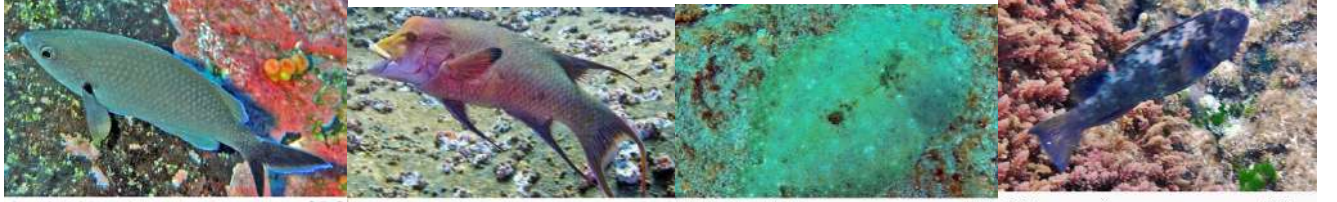
# File S2: Roca Partida Fish Images **Plates 1-3**



*Acanthocybium solandri* AEP *Acanthemblemaria mangognatha* VBM *Acanthurus nigricans* LJR *Acanthurus xanthopterus* AGH



*Aluterus scriptus* CDC *Anisotremus perezponcedeleoni* HeH *Arothron meleagris* Wet *Aulostomus chinensis* CDC



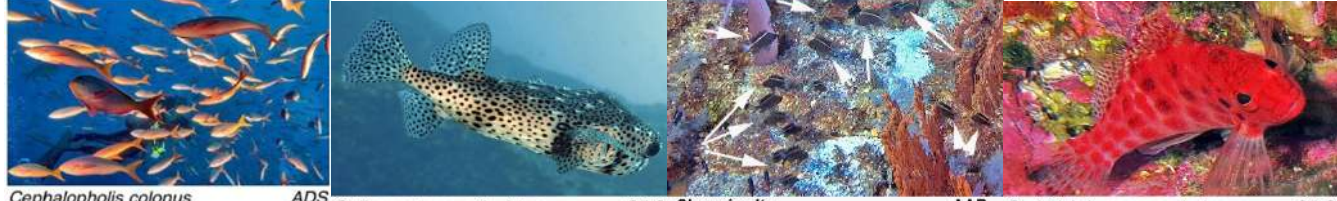
*Azurina hirundo* CDC *Bodianus diplotaenia* CDC *Bothus mancus* TAP *Calotomus carolinus* HeH



*Cantherhines dumerilii* LJR *Canthigaster punctatissima* Wet *Caranx lugubris* ADS *Caranx sexfasciatus* LJR



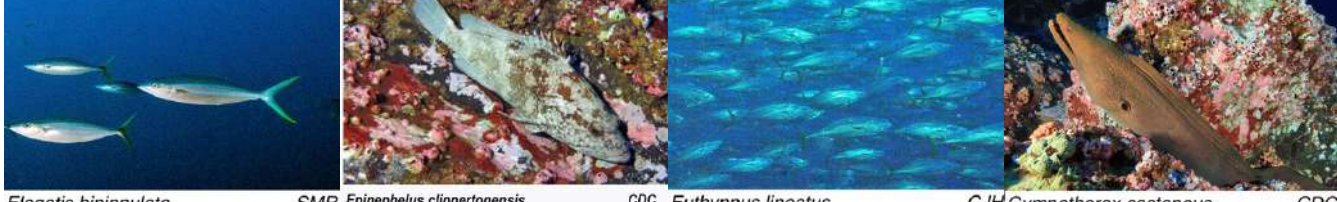
*Carcharhinus albimarginatus* CJE *Carcharhinus falciformis* LJR *Carcharhinus galapagensis* CDC *Carcharhinus limbatus* CJH



*Cephalopholis colonus* ADS *Chilomycterus reticulatus* CDC *Chromis alta* AAB *Cirrhitichthys oxycephalus* CDC



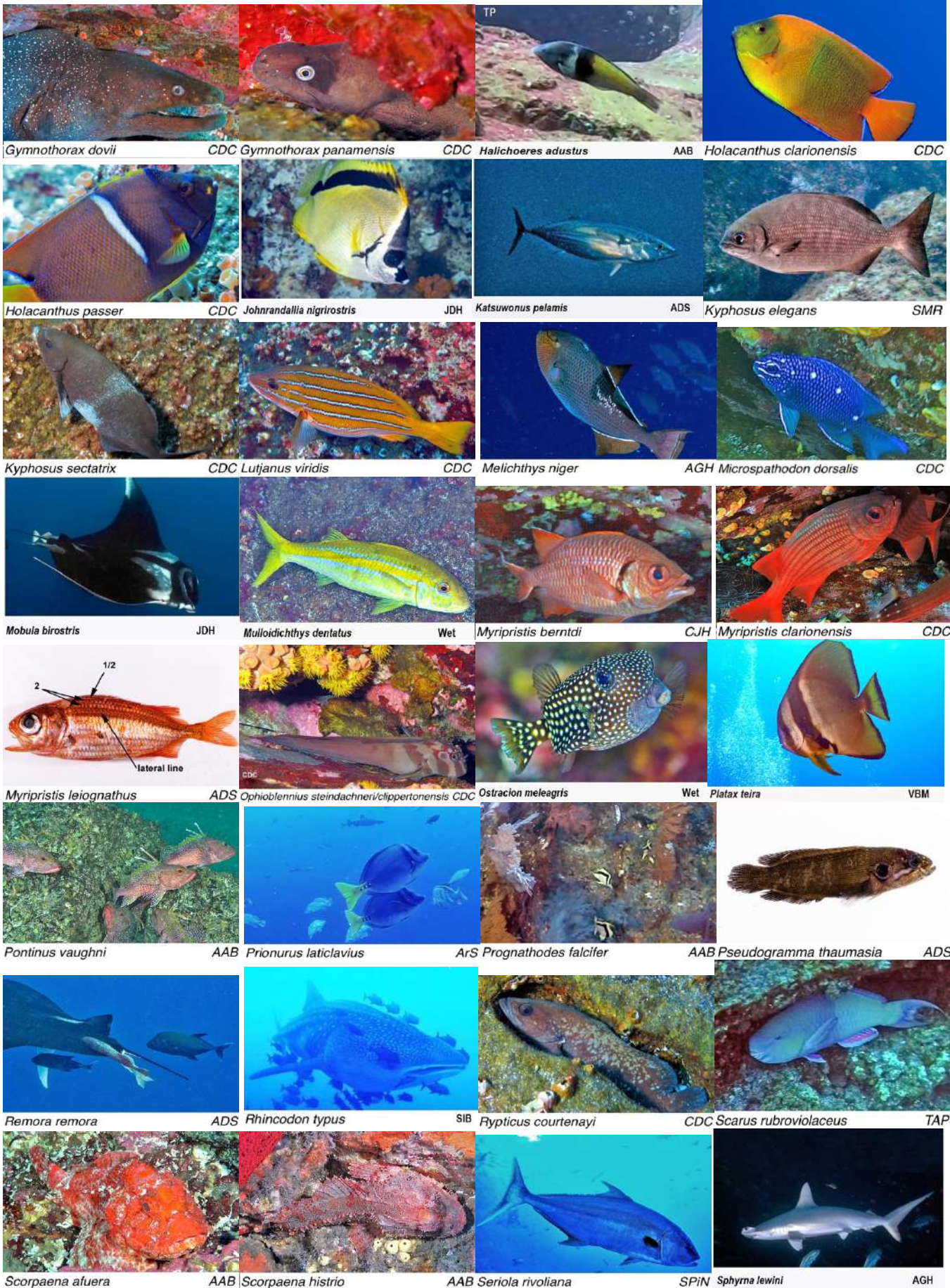
*Cirrhitus rivulatus* CDC *Citharichthys* sp. AAB *Decapterus macarellus* CDC *Dermatolepis dermatolepis* JDH



*Elagatis bipinnulata* SMR *Epinephelus clippertonensis* CDC *Euthynnus lineatus* CJH *Gymnothorax castaneus* CDC



## Plate 2





## Plate 3



*Stegastes leucurus*

CDC



*Sufflamen verres*

LJR



*Thalassoma grammaticum*

Sib



*Thalassoma virens*

AMiN



*Thunnus albacares*

AEP



*Trachinotus stilbe*

ADS



*Triacodon obesus*

JDH



*Uraspis helvola*

JDH



*Xanthichthys mento*

LJR



*Zanclus cornutus*

AdN



# File S3: San Benedicto Island Fish Images      Plates 1-4





## Plate 2



*Cephalopholis colonus*

SMR *Cephalopholis panamensis*

LJR *Chilomycterus reticulatus*

SMR *Chromis alta*

LJR



*Cirrhitichthys oxycephalus*

CJE *Cirrhitus rivulatus*

LJR *Coryphopterus urospilus*

EAP *Ctenochaetus marginatus*

AGH



*Decapterus macarellus*

SSM

*Dermatolepis dermatolepis*

JDH *Diodon holocanthus*

JDH *Diodon hystrix*

AME



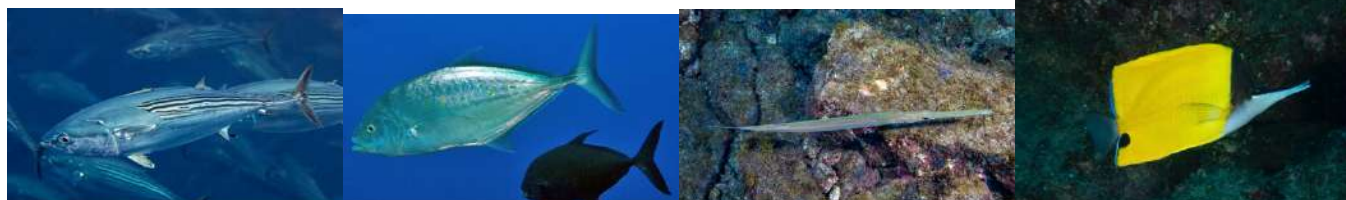
*Doryrhamphus melanopleura*

LJR *Entomacrodus chiostictus*

LJR *Epinephelus clippertonensis*

SSM *Epinephelus labriformis*

SMR



*Euthynnus lineatus*

AME *Ferdaulia orthogrammus*

CJH *Fistularia commersonii*

CJE *Forcipiger flavissimus*

SMR



*Galeocerdo cuvier*

CJE *Gymnomuraena zebra*

CJE *Gymnothorax castaneus*

AME *Gymnothorax dovii*

SMR



*Gymnothorax panamensis*

CJE *Halichoeres insularis*

AME *Halichoeres nicholsi*

JDH *Halichoeres sanchezi*

AME



*Heteropriacanthus carolinus*

EAP *Holacanthus clarionensis*

AGH *Hypanus longus*

CJE *Hyporthodus cifuentesii*

AAB



# Plate 3



*Iniistius pavo* SSM



*Johnrandallia nigrirostris* SSM



*Kyphosus elegans* CJH



*Kyphosus ocyurus* CDC



*Kyphosus sectatrix* ADS



*Kyphosus vaigiensis* PIN



*Labrisomus socorroensis* LJR



*Luftjanus argentiventris* AAB



*Luftjanus viridis* JDH



*Lythrypnus insularis* CJE



*Melichthys niger* SMR



*Microspathodon bairdii* LJR



*Microspathodon dorsalis* SMR



*Mobula birostris* CJE



*Mobula tarapacana* PIN



*Mulloidichthys dentatus* SMR



*Muraena lentiginosa* CDC



*Myrichthys pantostigmus* JDH



*Myripristis berndti* RLC



*Myripristis clarionensis* SMR



*Narcine entemedor* CJE



*Orthopristis cantharina* AAB



*Neoniphon suborbitalis* CDC



*Novaculichthys taeniourus* ADS



*Ophioblennius steindachneri* AME



*Ostracion meleagris* EAP



*Pareques* sp. SMR



*Prionurus laticlavus* AME



*Pontinus vaughni* AAB



*Prognathodes falcifer* AAB



*Remora remora* CJE



*Rhincodon typus* SPIN



## Plate 4



*Rypticus courtenayi*

AME



*Scarus rubroviolaceus*

LJR



*Scorpaena mystes*

BeN



*Scorpaenodes xyris*

ADS



*Scuticaria tigrina*

AME



*Serranus socorroensis*

SSM



*Sphoeroides lobatus*

LJR



*Sphyrna lewini*

ADS



*Stegastes acapulcoensis*

ADS



*Stegastes flavilatus*

SMR



*Stegastes leucurus*

SSM



*Stegastes redemptus*

SMR



*Stethojulis bandanensis*

SSM



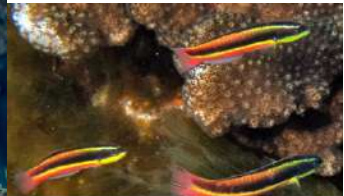
*Sufflamen verres*

SSM



*Thalassoma grammaticum*

AME



*Thalassoma lucasanum*

SMR



*Thalassoma virens*

LJR



*Tomicodon absitus*

ADS



*Tomicodon absitus*

ADS



*Triaenodon obesus*

EAP



*Uraspis helvola*

Sib



*Xanthichthys mento*

ADS



*Zanclus cornutus*

SSM

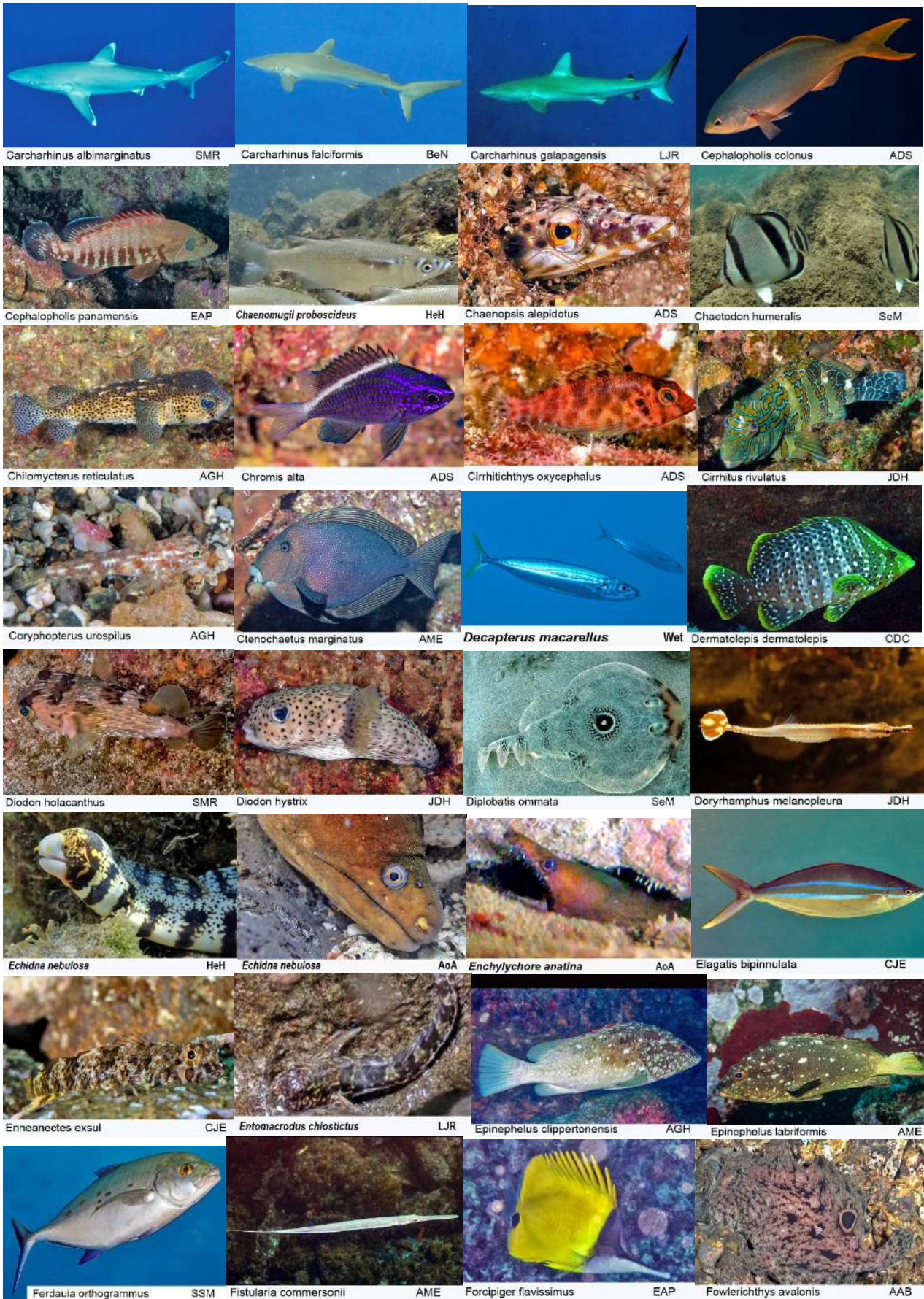


# File S4: Socorro Island Fish Images      Plates 1-5





## Plate 2





# Plate 3



*Galeocerdo cuvier*

BeN



*Girella semicincta*

LBA



*Gobiosoma canidens*

AoA



*Gymnomuraena zebra*

AME



*Gymnothorax castaneus*

SSM



*Gymnothorax dovii*

BeN



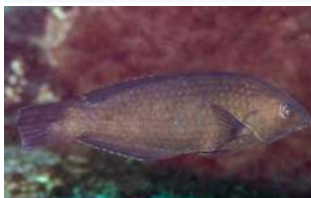
*Gymnothorax flavimarginatus*

AGH



*Gymnothorax panamensis*

AGH



*Halichoeres adustus*

AME



*Halichoeres insularis*

SMR



*Halichoeres nicholsi*

CJE



*Halichoeres notospilus*

AME



*Hemiramphus saltator*

AoA



*Heteropriacanthus carolinus*

AoA



*Holacanthus clarionensis*

EAP



*Hypanus dipterus*

AAB



*Hypanus longus*

AME



*Hyporthodus cifuentesi*

CAS



*Hypsoblennius proteus*

CJE



*Iniistius pavo*

LJR



*Johnrandallia nigrostris*

AME



*Kuhlia mugil*

AoA



*Kyphosus elegans*

SeM



*Kyphosus ocyurus*

LJR



*Kyphosus sectatrix*

ADS



*Kyphosus vaigiensis*

AoA



*Labrisomus socorroensis/xanti*

SeM



*Lactoria diaphana*

BIO



*Lutjanus peru*

AAB



*Lutjanus argentiventris*

HeH



*Lutjanus viridis*

AGH



*Lythrypnus insularis*

CJE



## Plate 4



*Melichthys niger*

AME



*Microspathodon dorsalis*

JDH



*Microspathodon bairdii*

AoA



*Mobula birostris*

LJR



*Mugil cephalus*

AoA



*Mugil setosus*

LBA



*Mulloidichthys dentatus*

SMR



*Myrichthys pantostigmus*

HeH



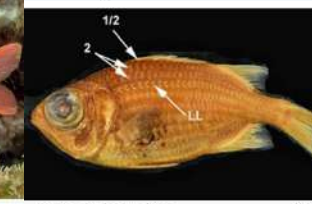
*Myripristis berndti*

SMR



*Myripristis clarionensis*

LJR



*Myripristis leiognathus*

Kal



*Narcine entemedor*

ADS



*Naukrates ductor*

AoA



*Neoniphon suborbitalis*

AGH



*Novaculichthys taeniourus*

SMR



*Ophioblennius steindachneri clippertonensis*

EAP



*Ostracion meleagris*

EAP



*Plagiotremus azaleus*

JDH



*Platax teira*

Ángelica Tamayo



*Pontinus vaughni*

AAB



*Prionurus laticlavus*

SMR



*Prognathodes falcifer*

JoH



*Remora remora*

CJE



*Rhincodon typus*

TRG



*Rypticus courtenayi*

CJE



*Scarus compressus*

HeH



*Scarus ghobban*

JDH



*Scarus rubroviolaceus*

AoA



*Scorpaenodes xyris*

EAP



*Scorpaena afueriae*

CAS



*Scorpaena mystes*

Sem



*Scuticaria tigrina*

AGH



## Plate 5



*Seriola rivoliana*

HeH



*Serranus socorroensis*

CJE



*Sphoeroides lobatus*

HeH



*Sphyrna lewini*

BeN



*Stegastes flavilatus*

SeM



*Stegastes leucurus*

SSM



*Stegastes redemptus*

CJE



*Stethojulis bandanensis*

CJE



*Sufflamen verres*

JDH



*Synodus lacerinus*

ADS



*Thalassoma grammaticum*

JDH



*Thalassoma lucasanum*

AGH



*Thalassoma virens*

CJE



*Thunnus albacares*

BeN



*TomiCODon absitus*

LJR



*Trachinotus stlbe*

AME



*Triaenodon obesus*

JDH



*Tylosurus fodiator*

AoA



*Uraspis helvola*

CJE



*Uropterygius macrocephalus*

LBA



*Xanthichthys mento*

ADS



*Xyrichtys species A*

CDC



*Zanclus cornutus*

CJE



**File S5:** Color patterns of *Canthigaster punctatissima* and *C. janthinoptera* from the Revillagigedo National Park



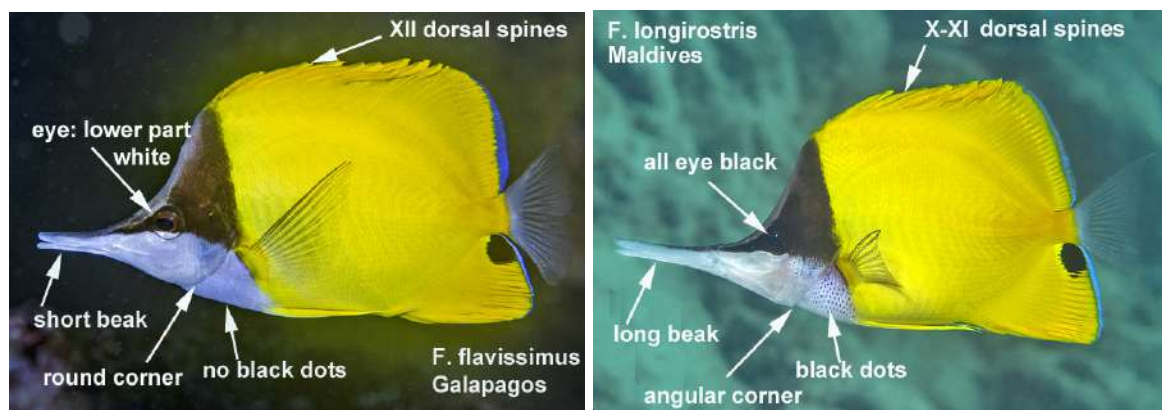
**A:** *C. punctatissima*. Fish lacks eye lines and is covered with regular round spots. **B-D:** *C. janthinoptera*. **B.** with radiating eye lines and an incomplete ocellus; **C.** with a partial ocellus and



irregular eye marks; D. with a partial ocellus and round eye marks. E & F. Recently recruited juveniles. Photos: A Allison Estape, Socorro; B. Sarah Richter, Socorro; C Sarah Richter, Socorro; D Alasdair Duncan-Smith, San Benedicto; E Carlos Estape, Clarion; F Serenity Mitchell, San Benedicto.



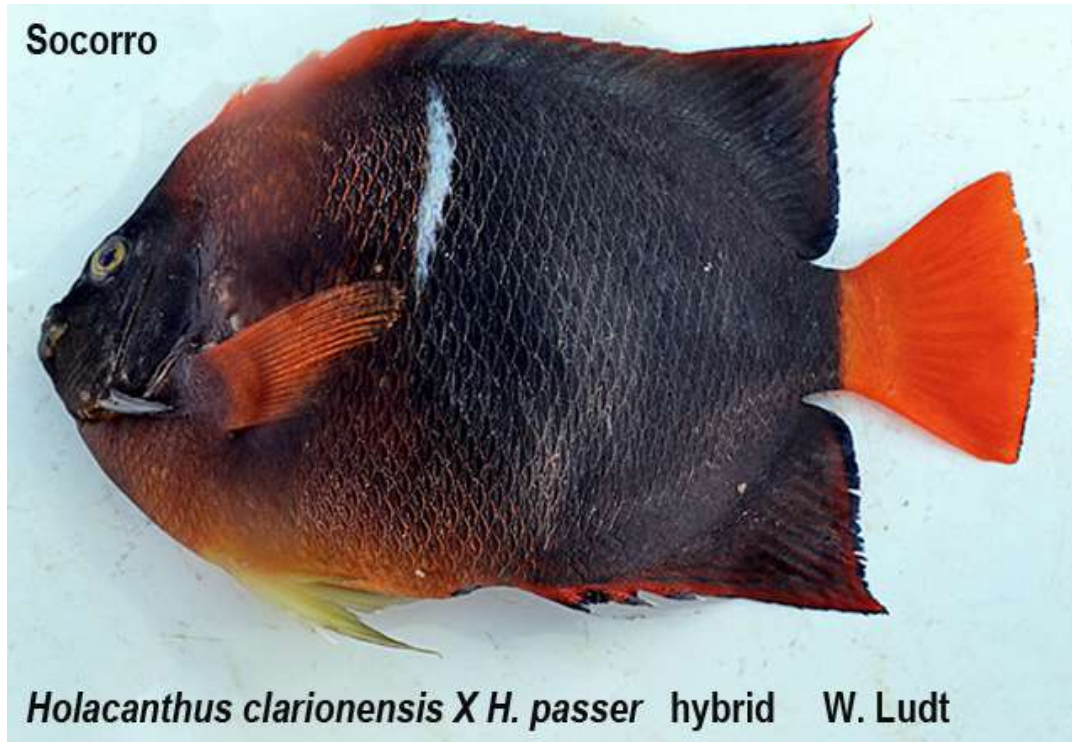
**File S6:** Diagnostic visible features that distinguish two species of the chaetodontid genus *Forcipiger*.



Images: *F. flavissimus* Allison Estape; *F. longirostris*: rafi3, iNaturalist, CC.BY-NC



**File S7:** Image of an apparent hybrid of *Holacanthus passer* and *Holacanthus clarionensis* collected in the Revillagigedo National Park in November 2022





**File S8:** Diagnostically distinguishing numbers of scale rows above the lateral line in two species of *Myripristis*. Images by C&A Estape.





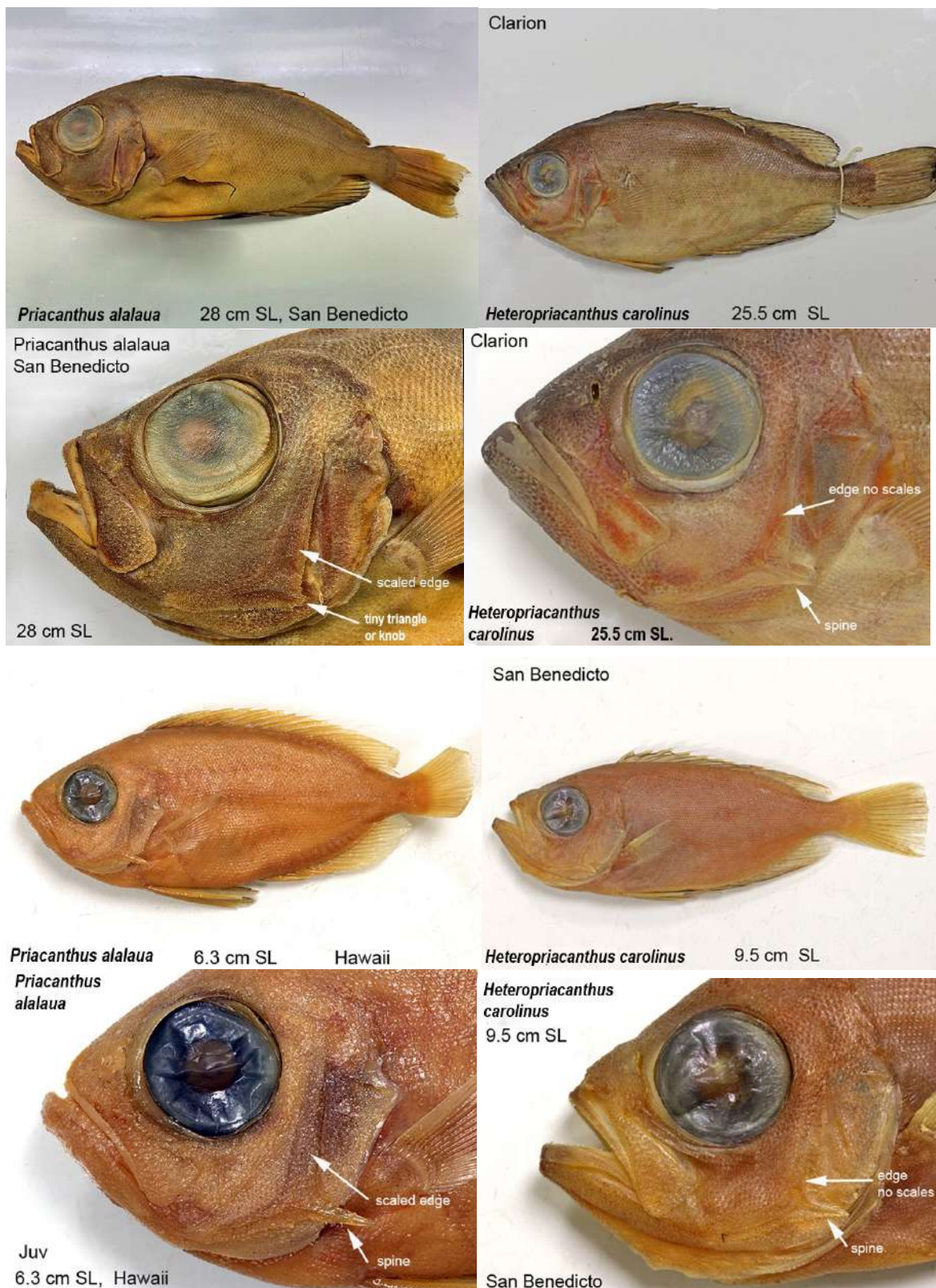
**File S9: Distinguishing characteristics of two similar species of priacanthids.**

**Images of LACM specimens by W. Ludd**

***Priacanthus alalaua***

***Heteropriacanthus carolinus***

Note (1) degree of development of a preopercular spine in adults; (2) presence/absence of scales on the rear edge of the preoperculum in both adults and juveniles





**File S10:** Distinguishing features of Juvenile, Initial Phase and Terminal Phase coloration patterns of *Halichoeres nicholsi* from the Revillagigedo National Park and elsewhere in the Tropical Eastern Pacific



***Halichoeres nicholsi*** from Baja California.

Photos: Carlos & Alliston Estape



***Halichoeres nicholsi*** from the Revillagigedo Is.

Photos: left and right Andre Hernandez, center Sarah Richter



File S11. Similar color patterns of two species of the goby genus *Lythrypnus*.

Images: ADS Alasdair Dunlap-Smith; AME Allison Morgan Estape.



***Lythrypnus* cf. *dalli***

**Clarion Is.**

**ADS**



***Lythrypnus* *dalli***

**Cabo San Lucas**

**AME**