NOAA Technical Memorandum NMFS

JUNE 2002

ICHTHYOPLANKTON AND STATION DATA FOR SURFACE (MANTA) AND OBLIQUE (BONGO) PLANKTON TOWS TAKEN DURING A SURVEY IN THE EASTERN TROPICAL PACIFIC OCEAN JULY 28 - DECEMBER 9, 1999

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NOAA-TM-NMFS-SWFSC-338

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
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ABSTRACT

This report provides ichthyoplankton, juvenile/adult fish, and associated station and tow data from surface and water column plankton samples collected during the 1999 Southwest Fisheries Science Center *Stenella* Abundance Research Project (STAR99) survey to the eastern tropical Pacific. It is the seventh in a series of reports that presents these data for all Southwest Fisheries Science Center marine mammal surveys in the eastern tropical Pacific from 1987 to the present. In total, 196 Manta net tows and 69 bongo net tows were taken between 28 July and 9 December, 1999, during which two research vessels surveyed within an area from approximately 30°N and 18° S latitude, and from the Gulf of Panama westward to about 153° W. The data are presented in 11 tables, and distributions of the 20 most frequently occurring larval fish taxa from each net tow type are shown in a series of figures. The background, methodology, and necessary interpretive information are given in an accompanying text.

INTRODUCTION

In 1999 the Southwest Fisheries Science Center (SWFSC) conducted a survey of the eastern tropical Pacific (ETP) to monitor dolphin stocks and make oceanographic and ecological observations related to those stocks. This survey was in response to the 1997 International Dolphin Conservation Program Act (Public Law 105-42) that directed the National Marine Fisheries Service (NMFS) to determine the impacts that the purse-seine tuna fishery in the ETP may have on depleted dolphin stocks (Gerrodette et al. 1998). As part of the implementation of this act, Congress directed NMFS to conduct ETP dolphin population surveys in 1998, 1999, and 2000. These surveys are essentially a continuation of a series of six surveys conducted in the ETP from 1986 to 1992, that monitored the abundance and distribution of dolphin stocks and, concurrently, the physical and biological variables in their habitat. A primary objective of both survey series was to determine the relationship between environmental variables and population trends in ETP dolphin stocks. The STAR survey focused on the offshore and coastal spotted dolphin (*Stenella attenuata attenuata* and *S. attenuata graffmani,* respectively) and the eastern spinner dolphin (*S. longirostris orientalis*). This resulted in slight modifications to the sampling strategy used in the 1986–1992 surveys. Principally, the sampling area was expanded to fully encompass the stocks in question and effort was stratified to adequately sample the habitat of four dolphin stocks: the northeastern offshore spotted, the western/southern offshore spotted, the coastal spotted, and the eastern spinner (Gerrodette et al. 1998).

As in the 1998 (Ambrose et al. 2002) and 1986–92 (Moser et al. 2000; Ambrose et al. 2000; Charter et al. 2000; Sandknop et al. 2000; Watson et al. 2000) ETP dolphin surveys, ecological sampling in 1999 included collection of ichthyoplankton and juvenile fishes with a surface (Manta) net in order to examine the distributions and abundances of ETP fish larvae, and to extend the ichthyoplankton time series begun during the Eastropac Expeditions (Ahlstrom 1971, 1972). Oblique bongo tows were added in the 1998 and 1999 surveys.

This report provides ichthyoplankton and associated station and tow data from the 1999 STAR survey in the ETP from July 28 to December 9, 1999 (surface tow data: Tables 1–6; oblique tow data: Tables 7–11). The survey was conducted aboard the NOAA research vessels *David Starr Jordan* and *McArthur*. Oceanographic data other than Manta and bongo tow data are reported in Philbrick et al. (2001). Usually a conductivity-temperature-depth instrument (CTD) cast to 1000 m was made in the morning before sunrise and in the evening after sunset to measure temperature, salinity, oxygen, chlorophyll, phaeophytin, and nutrients, and to collect water samples for productivity (morning casts only) measurements. For the morning casts a fluorometer was attached to the CTD to measure in situ fluorescence. Sea surface temperature and salinity were measured continuously while the ship was underway. Expendable bathythermograph (XBT) casts were made to 760 m depth daily at 0900, 1200, and 1500 hrs (local ship time). In addition to marine mammal observations (Kinzey et al. 2000), data on bird and turtle sightings were made throughout the survey

(Olson et al. 2001). Robert Pitman made observations on surface organisms and associated environmental variables at night-light stations throughout the survey and made extensive collections of fishes, squids, and other surface-living organisms (Olson et al. 2001). In addition to the nightly Manta (surface) and bongo (oblique) ichthyoplankton tows, oblique tows were taken from both ships with a 0.5m ring net when time permitted. The ring net samples have been archived for later analysis.

SAMPLING AREA AND PATTERN

The cruise protocol for each ship called for a Manta tow to be taken at night after the evening CTD cast. This was followed by a bongo tow to 200 m depth on the *McArthur*. A total of 196 Manta tows was made on the survey, 98 aboard each vessel; 69 bongo tows were taken aboard the *McArthur*.

The survey was conducted in six legs on the *Jordan* and five legs on the *McArthur*:

Jordan Leg 1	28 July–16 August	San Diego, California to Manzanillo, Mexico
Jordan Leg 2	20 August–9 September	Manzanillo to Acapulco, Mexico
Jordan Leg 3	13 September–1 October	Acapulco, Mexico to Puntarenas, Costa Rica
Jordan Leg 4a	8 October–13 October	Puntarenas, Costa Rica to Puerto Ayora, Ecuador
Jordan Leg 4b	18 October–28 October	Puerto Ayora, Ecuador to Callao, Peru
Jordan Leg 5	1 November–15 November	Callao, Peru to Panama City, Panama
Jordan Leg 6	19 November–9 December	Panama City, Panama to San Diego, California
McArthur Leg 1	28 July–26 August	San Diego, California. to Honolulu, Hawaii
McArthur Leg 2	1 September–29 September	Honolulu, Hawaii to Puntarenas, Costa Rica
McArthur Leg 3	5 October– 23 October	Puntarenas, Costa Rica to Acapulco, Mexico
McArthur Leg 4	27 October–17 November	Acapulco to Manzanillo, Mexico
McArthur Leg 5	21 November–9 December	Manzanillo, Mexico to San Diego, California

ICHTHYOPLANKTON SAMPLING GEAR AND METHODS

Surface plankton tows were made with a Manta net (Brown and Cheng 1981) identical to that used on California Cooperative Oceanic Fisheries Investigations (CalCOFI) cruises. It consists of a rectangular mouth 15.5 cm deep and 86 cm wide attached to a frame that supports square lateral extensions covered with plywood and urethane foam. These extensions stabilize the net when it is towed and keep the top of the net at the sea surface. The net is constructed of 0.505 mm nylon mesh. The towing bridle is asymmetrical with one side longer than the other; when the net is towed this bridle arrangement forces the mouth away from the ship at a slight angle. A General Oceanics flowmeter was suspended across the center of the net mouth to measure the amount of water filtered during each tow. Two towing procedures were used. On the *Jordan* a tow line from the Manta bridle was attached to the hydrographic wire and then lowered to slightly below the surface of the water before the net was deployed. A weight attached to the hydrographic wire below the line kept the top of the net mouth at the surface and the tow line below the mouth of the net. On the *McArthur* the net was towed from a boom on the starboard side of the ship, with the bridle attached directly to the hydrographic wire. Hauls were made at a ship speed of 1.0–2.0 knots for 15 minutes. Samples were preserved in 5% buffered formalin and returned to the plankton sorting laboratory at the SWFSC at the end of the cruise.

Oblique net tows were made with a bongo net, consisting of a pair of circular frames connected to a central axle (McGowan and Brown 1966; Smith and Richardson 1977). The standard CalCOFI bongo used on this survey has 71 cm diameter frames; for the STAR cruise nets and cod ends constructed of 0.333 mm

mesh were used (the standard CalCOFI net is of 0.505 mm mesh). The standard haul was a 15-min double oblique haul to 200 m depth, intended to encompass the vertical range of most ichthyoplankters. Hauls were made at a ship speed of 1.5–2.0 knots and initiated by clamping the net to the towing cable above a 34 kg weight suspended below the surface. The net was lowered to ~ 200 m depth by paying out 300 m of wire at 50 m/minute (35 m of depth/minute). After fishing at depth for 30 seconds, the net was retrieved at about 20 m/min (14 m of depth/min). The angle of stray was recorded every 30 seconds and maintained at 45° (± 3°) by adjusting ship speed and course. After reaching the surface, the nets were washed down and the sample from the outboard net was preserved in 5% formalin buffered with sodium borate. At the beginning and end of each tow, readings were made from a flowmeter suspended in the mouth of the starboard net. Detailed descriptions of gear and CalCOFI methods are given by Kramer et al. (1972) and Smith and Richardson (1977).

LABORATORY PROCEDURES

The volume of water filtered by each Manta net was computed from the flowmeter readings. A standard haul factor (SHF) was calculated for each bongo tow to make them comparable and to allow estimation of areal abundance. The SHF is calculated by the formula:

$$SHF = \frac{10\,D}{V}$$

where D = depth of haul = cosine of the average angle of stray of the towing cable multiplied by cable length (m)

V = total volume of water (m^3) strained during the haul

$$V = R \cdot a \cdot p$$

where R = total number of revolutions of the current meter during the haul

a = area (m^2) of the mouth of the net

p = length of the column of water needed produce one revolution of the current meter

Detailed descriptions of factors involved in calculating these values are presented in Ahlstrom (1948), Kramer et al. (1972), and Smith and Richardson (1977). Zooplankton displacement volumes were determined for each bongo sample (Kramer et al. 1972). Those containing >25 ml of plankton were fractioned to ~50% of their original volume prior to being sorted. Zooplankton volumes were not determined for Manta samples; all were entirely sorted. Sorting involved the removal of all ichthyoplankton; some samples also contained limited numbers of juvenile, and occasionally adult, stages of fishes which also were removed and bottled separately in 3% formalin. Constituent taxa in the samples were identified by S. R. Charter, E. M. Sandknop, B. Y. MacCall, and the senior author. Early ontogenetic stages of fishes are difficult to identify and this is further complicated by the large number and diversity of species which contribute to the ichthyoplankton in the ETP. Most identifications were based on descriptions of ontogenetic series in an identification guide to early stages of fishes in the California Current and adjacent regions (Moser 1996). Larval specimens that could not be identified with the guide were identified by establishing ontogenetic series on the basis of morphology, meristics, and pigmentation, and then linking these series through overlapping features to known metamorphic, juvenile, or adult stages (Powles and Markle 1984). Fischer et al. (1995) was a primary source of information on distribution and taxonomy of adult fishes of the

ETP. Except for damaged specimens, a large proportion of the larvae and most juvenile/adults taken in these tows could be identified to species. The types of larvae most difficult to identify were those of tropical shorefishes (e.g., Sciaenidae, Gerreidae) but most oceanic fishes could be identified to species or at least to genus. In Manta tow samples a total of 137 larval fish categories (including "unidentified") was identified: 85 to species, 35 to genus, 3 to subfamily, and 13 to family. In bongo net samples a total of 148 categories (including "unidentified" and "disintegrated") was identified: 90 to species, 39 to genus, 4 to subfamily, 10 to family, and 3 to order.

The following taxonomic categories in Tables 2– 5 and 8–11 require special explanation:

Cyclothone spp. – Small or damaged larvae lacking diagnostic characters.

Disintegrated fish larvae – Larvae that could not be identified because of their poor condition; separated from the "unidentified" category to monitor the general condition of the ichthyoplankton samples through the time series.

Exocoetus spp. – *E. monocirrhus* and *E. volitans* occur in the study area and their larvae smaller than about 10 mm cannot be reliably distinguished.

Hirundichthys spp. – Small or damaged larvae lacking diagnostic characters, probably most are *H. marginatus*.

Lampanyctus spp. – Small or damaged larvae lacking diagnostic characters; probably includes *Nannobrachium* spp. larvae, which can be virtually indistinguishable from *Lampanyctus* in the early larval period.

Lestidium spp. – Larvae are predominantly a single species, *Lestidium* sp. (Ege 1953). Adults of this species collected during other studies of the ETP resemble *Lestidium bigelowi* Graae, known from the Indian Ocean.

Mugil spp. – Mugilid larvae lacking the full complement of anal fin elements (larvae < ~5–6 mm) and those with 12 total anal fin elements could not be identified to species; *Mugil cephalus* has 9–11 total anal fin elements; *M. curema* has 13.

Prognichthys spp. – *P. sealei* and *P. tringa* occur in the study area and their larvae cannot be reliably distinguished. The former species has a primarily oceanic distribution whereas the latter is coastal; the larvae collected in 1999 were predominantly coastal and most (perhaps all) probably are *P. tringa.*

Unidentified fish larvae – Larvae that were generally in good condition but could not be identified because of their small size or early stage of development.

Vinciguerria lucetia – *V. lucetia* is the most common *Vinciguerria* species in the study area, but *V. nimbaria* and *V. poweriae* also occur in the eastern Pacific, primarily west of about 130° W; larvae of the three species are very difficult to distinguish and it is possible that some *V. nimbaria* and *V. poweriae* were included within *V. lucetia*, particularly at *McArthur* stations M4 14 through M4 32.

SPECIES SUMMARY

Of the five most abundant taxa taken in Manta net samples on this survey, the herring genus *Opisthomema* ranked first in abundance with 25.6% of the total but tied for 11th in occurrence with only 7.6% positive tows (Tables 2 and 3). Panama lightfish *Vinciguerria lucetia* ranked second in abundance with 21.2% of the total larvae, and first in occurrence with 50.0% positive tows. The scombrid genus *Auxis* ranked third in abundance and occurrence with 7.8% of the total larvae and 28.6% positive tows. Shortwing flyingfish *Oxyporhamphus micropterus* was fourth in abundance with 6.9% of the larvae and was second in occurrence with 30.6% positive tows. The flyingfish genus *Prognichthys* ranked fifth in both abundance and occurrence with 5.3% of the larvae and 12.8% positive tows. The next five most abundant taxa were blue bobo *Polydactylus approximans* (4.4% of total larvae), anchoveta *Cetengraulis mysticetus* (4.2%), Pompano dolphinfish *Coryphaena equiselis* (2.6%), mojarras, family Gerreidae (2.0%), and the mullet genus *Mugil* (1.8%). These taxa tied for 20th, tied for 30th, ranked 4th, and the last two tied for 8th in frequency of occurrence, respectively. The ten most abundant taxa accounted for 81.9% of all the larvae collected with Manta nets in the survey area. The remaining 18.1% was distributed among 127 other taxa, including "unidentified" (<0.1% of the total). Of the ten most abundant taxa, two (*Oxyporhamphus micropterus*, *Corypaena equiselis*) are epipelagic species, one (*Prognichthys*) is a genus containing both an epipelagic species (*P. seali*) and a coastal pelagic species (*P. tringa*), three (*Auxis*, *Opisthonema*, *Cetengraulis mysticetus*) are coastal pelagic taxa, three (*Mugil*, *Polydactylus approximans*, Gerreidae) are coastal, primarily epibenthic schooling taxa, and one (*V. lucetia*) is a midwater species that migrates to the epipelagic zone at night.

Of the five most abundant taxa taken in bongo net samples on this survey, Panama lightfish *Vinciguerria lucetia* ranked first in abundance and occurrence with 42.5% of the total larvae and 100% positive tows (Tables 8 and 9). Diogenes lanternfish *Diogenichthys laternatus* ranked second in abundance and occurrence with 27.4% of the total larvae and 92.6% positive tows. The lanternfish genus *Diaphus* ranked third in abundance and occurrence with 5.0 % of the total larvae and 76.8 % positive tows. The codlet species *Bregmaceros bathymaster* ranked fourth in abundance with 1.9% of the larvae but was collected in only two samples, tying with 21 other taxa for 74th in occurrence (2.9% positive tows). The lanternfish genus *Lampanyctus* ranked fifth in abundance with 1.8 % of the larvae and was 4th in occurrence with 52.2 % positive tows. The next five most abundant taxa were bigeye cigarfish *Cubiceps pauciradiatus* (1.4% of total larvae), the blacksmelt genus *Bathylagus* (1.4%), an unidentified codlet *Bregmaceros* (1.1%), the hatchetfish genus *Sternoptyx* (1.1%), and the sleeper family Eleotridae (0.9%). These species tied for 5th, ranked 7th, tied for 45th, tied for 5th, and tied for 37th in frequency of occurrence, respectively. The ten most abundant taxa totalled 84.6% of all the larvae collected with the bongo net in the survey area. The remaining 15.4% was distributed among 138 other taxa including "disintegrated" (0.1 %) and "unidentified" (0.1%). Of the ten most abundant taxa, one (*C. pauciradiatus*) is an epipelagic species and another *(Bregmaceros* sp.) probably is as well, one (*B. bathymaster*) is a neritic schooling species, one is a nearshore demersal family, and the others are midwater taxa that migrate towards the surface at night.

Only the ubiquitous *Vinciguerria lucetia* was among the ten most abundant taxa collected with both samplers. However, among the ten most abundant taxa in the Manta collections all but Gerreidae, *Prognichthys*, and *Cetengraulis mysticetus* also occurred in the bongo samples. Among the ten most abundant in bongo samples, all but *Bathylagus* spp. and *Bregmaceros* were collected with the Manta.

EXPLANATION OF FIGURES AND TABLES

Figures 4–43. Lengths of vertical bars are proportional to total larval counts for each station.

Table 1. This table lists for each Manta net tow the pertinent station and tow data for ichthyoplankton stations occupied by *Jordan* and *McArthur*. Cruises are designated by a six character alphanumeric code; the first two digits indicate the year and the second two the month, followed by the ship code, JD (*David Starr Jordan*), and M4 (*McArthur*). Data are listed sequentially by tow number. Regions are based on 15° latitude × 15° longitude squares (Figure 3). Time is listed as local time at the start of each tow in 24-hour designation. Values for total fish eggs and larvae are raw counts (unadjusted for volume of water filtered or standard haul factor). In 1999 the Manta or bongo tows and hydrographic casts were made at different times of the day. The column "CTD station" gives the CTD number where a Manta or bongo sample was collected at the same location as the hydrographic cast.

Table 2. Pooled occurrences of all larval fish taxa taken in Manta nets on *Jordan* cruise 9910JD and *McArthur* cruise 9910M4. Taxa are listed in rank order.

Table 3. Pooled raw counts (unadjusted for volume of water filtered) of all larval fish taxa taken in Manta net tows on *Jordan* cruise 9910JD and *McArthur* cruise 9910M4. Taxa are listed in rank order.

Table 4. Numbers of fish larvae for each taxon taken in Manta net tows on *Jordan* cruise 9910JD and *McArthur* cruise 9910M4, listed by tow number (Figures 1–2). Numbers of larvae are listed as raw counts and number per 100 m^3 of water filtered. Orders and families are listed in phylogenetic sequence (Eschmeyer 1998); other taxa are listed alphabetically.

Table 5. Average numbers of larvae (per 100 m^3 of water filtered) for each taxon taken in Manta net tows in the regions (see Figure 3) occupied on *Jordan* cruise 9910JD and *McArthur* cruise 9910M4.

Table 6. Numbers (raw counts) and size ranges of juvenile fishes taken in Manta net tows on *Jordan* cruise 9910JD and *McArthur* cruise 9910M4. Fish orders and families are listed in phylogenetic sequence (Eschmeyer 1998); genera and species are listed in alphabetical order. For each entry, the tow number is given first in bold type, the count is next in parentheses, and size range is given last.

Table 7. This table lists for each bongo net tow the pertinent station and tow data for ichthyoplankton stations occupied by *McArthur* cruise 9910M4 on this survey (see explanation of Table 1).

Table 8. Pooled occurrences of all larval fish taxa taken in bongo net tows on *McArthur* cruise 9910M4. Taxa are listed in rank order.

Table 9. Pooled numbers of larvae per 10 m^2 (adjusted for standard haul factor) of all larval fish taxa taken in bongo net tows on *McArthur* cruise 9910M4. Taxa are listed in rank order.

Table 10. Numbers of fish larvae for each taxon taken in bongo net tows on *McArthur* cruise 9910M4, listed by tow number (Figure 2). Larvae are listed as number per 10 m^2 of sea surface. Orders and families are listed in phylogenetic sequence (Eschmeyer 1998); other taxa are listed alphabetically.

Table 11. Average numbers of larvae (per 10 m^2 of sea surface) for each taxon taken in bongo net tows in the regions (see Figure 3) occupied on *McArthur* cruise 9910M4.

ACKNOWLEDGMENTS

We are indebted to Robert Pitman for his efforts in making a large proportion of the plankton tows and for overseeing the ichthyoplankton work on the expedition. We thank Lisa Ballance for her support on all aspects of the plankton tow work. We are grateful to the following members of the scientific crews of the two vessels for their efforts in conducting the plankton work: Kerry Kopitsky, Gil Braulik, Pedro Castenada, Erica Goetze, Kathy Hough, Paola Amador, and Kathy Noyes. Amy Hays trained the scientific crews in ichthyoplankton sampling and checked the field data. The samples were sorted by Lucy Dunn and Barbara McCall. Susan Manion entered the data and Susan Jacobson provided programming assistance. We thank Susan Manion for her excellent work in the production of the tables and distribution maps. The cooperation and assistance provided by the ships' crews were instrumental in making the collections and observations at sea.

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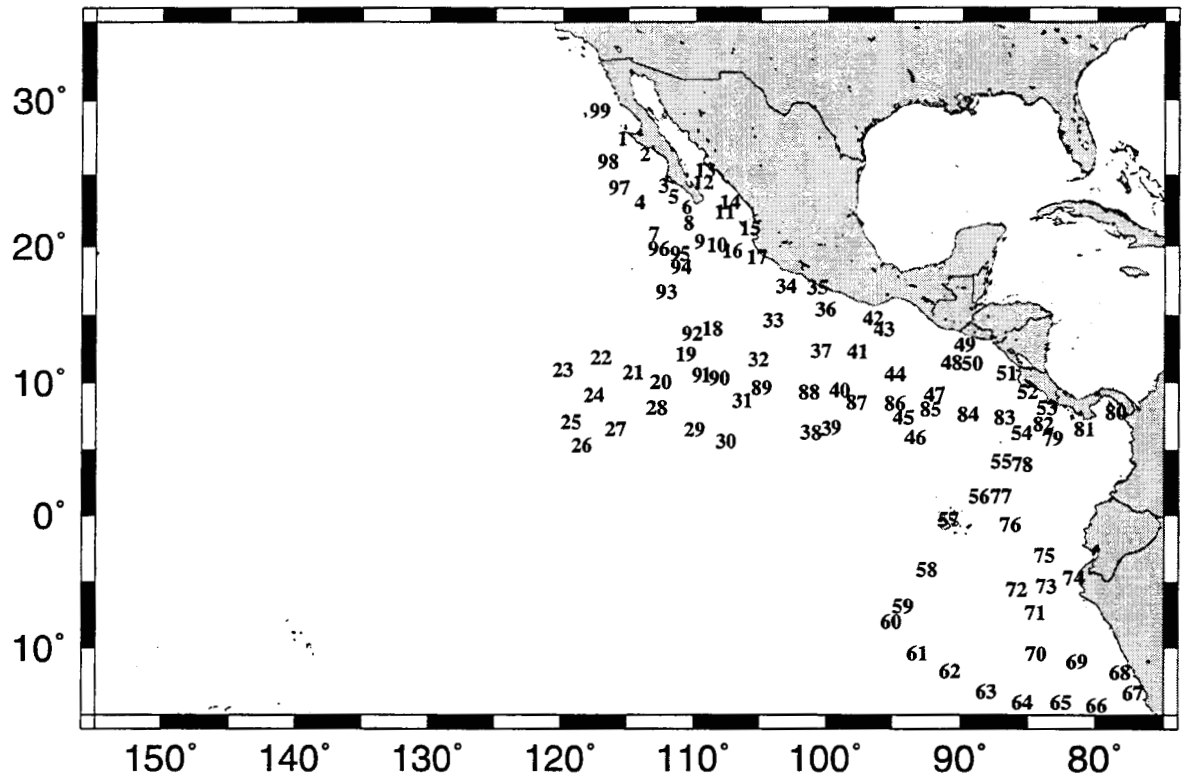

Figure 1. Manta net tow stations for *Jordan* cruise 9910JD.

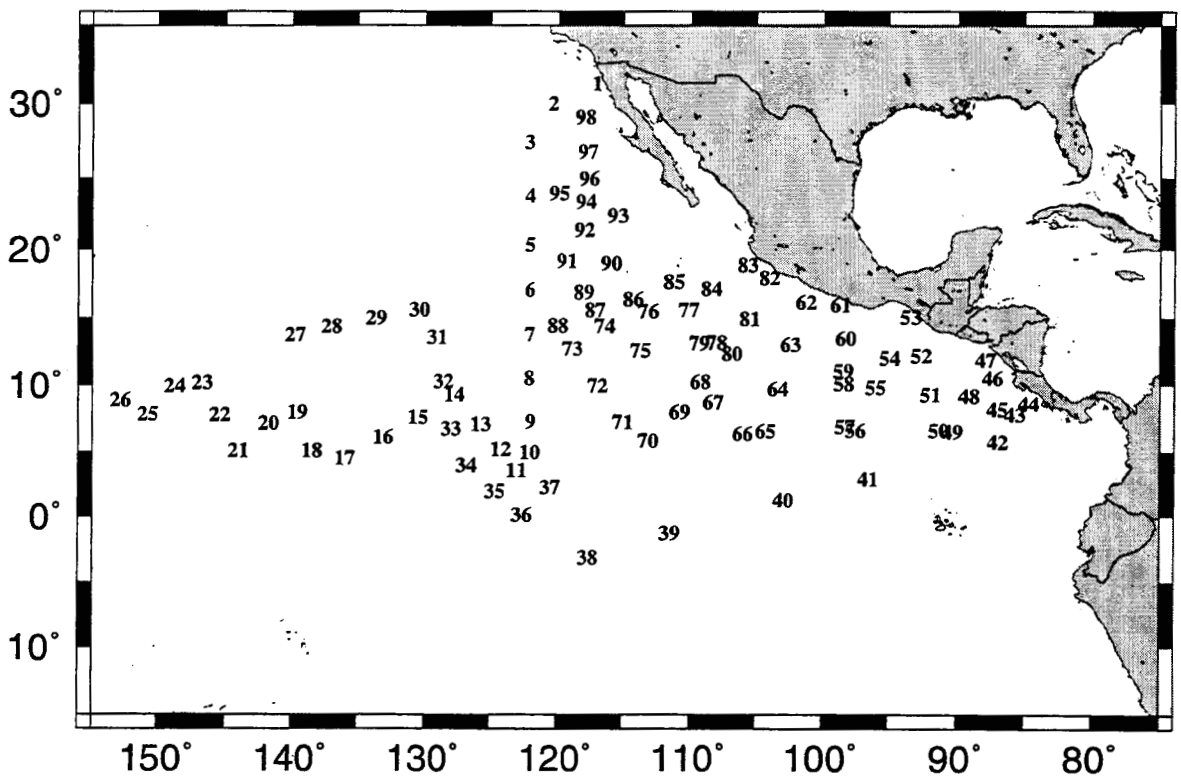

Figure 2. Manta and bongo net tow stations for *McArthur* cruise 9910M4.

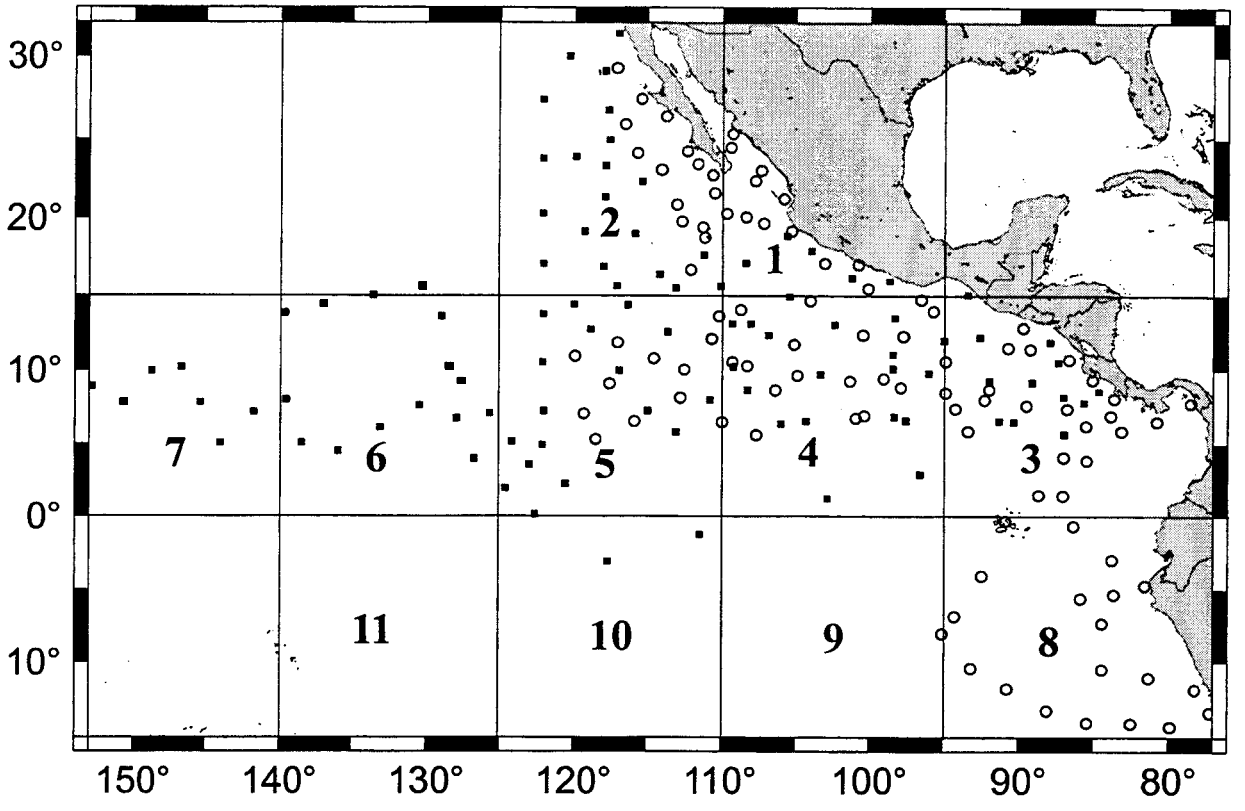

Figure 3. Sampling regions for 1999 eastern tropical Pacific dolphin survey indicated by numbers 1 to 11; net tow stations for *Jordan* cruise 9910JD are indicated by circles and for *McArthur* cruise 9910M4 by solid squares.

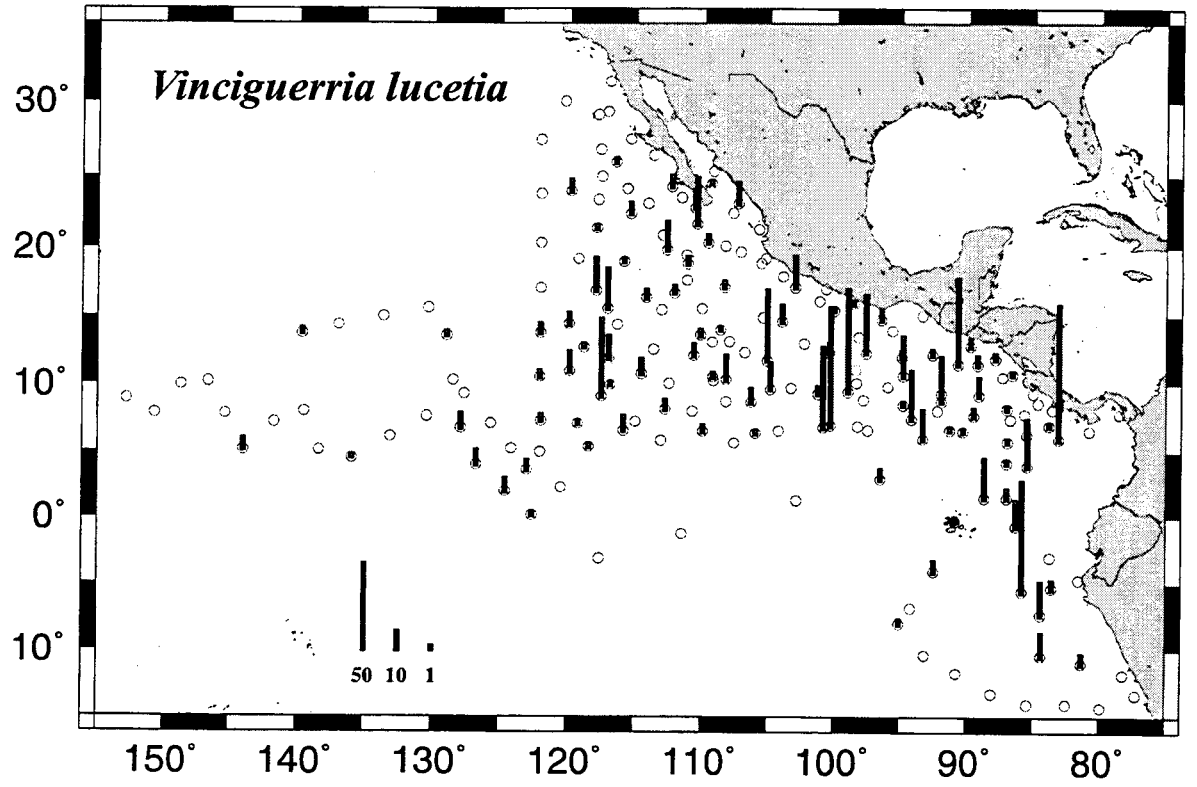

Figure 4. Distribution of *Vinciguerria lucetia* larvae from Manta net tows: 9910JD and 9910M4.

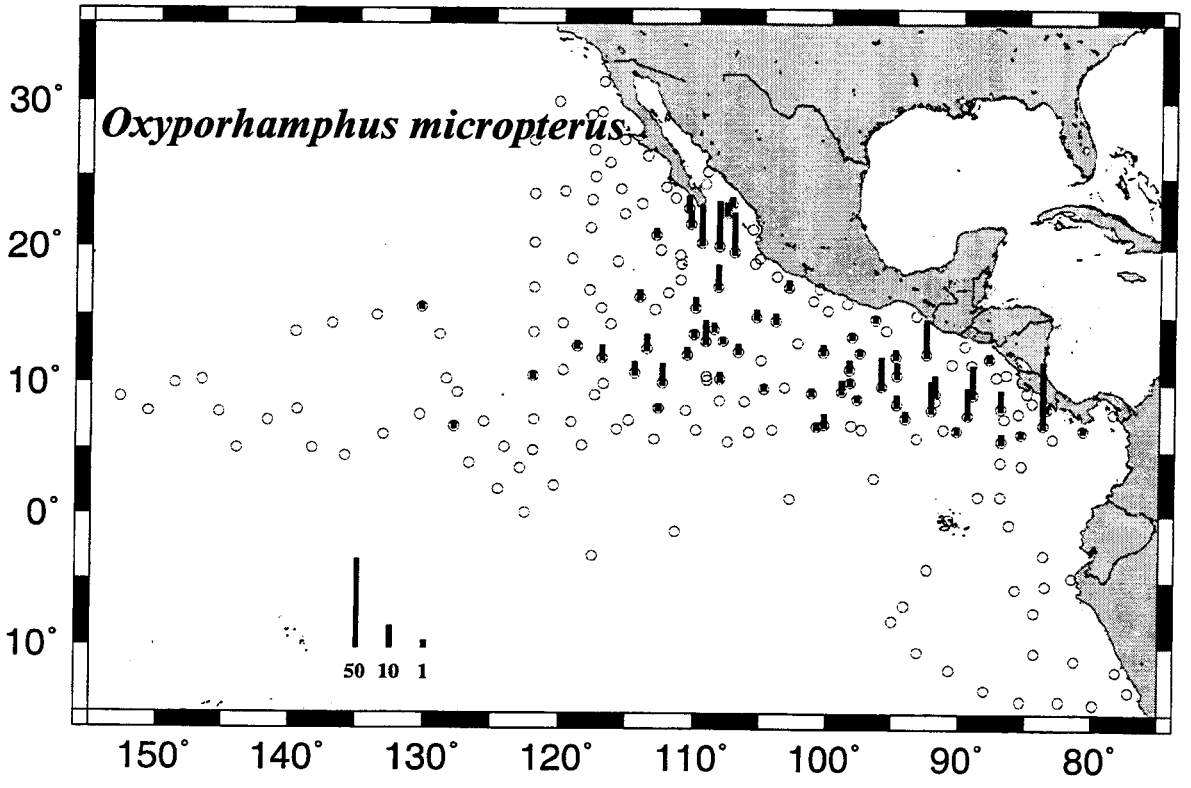

Figure 5. Distribution of *Oxyporhamphus micropterus* larvae from Manta net tows: 9910JD and 9910M4.

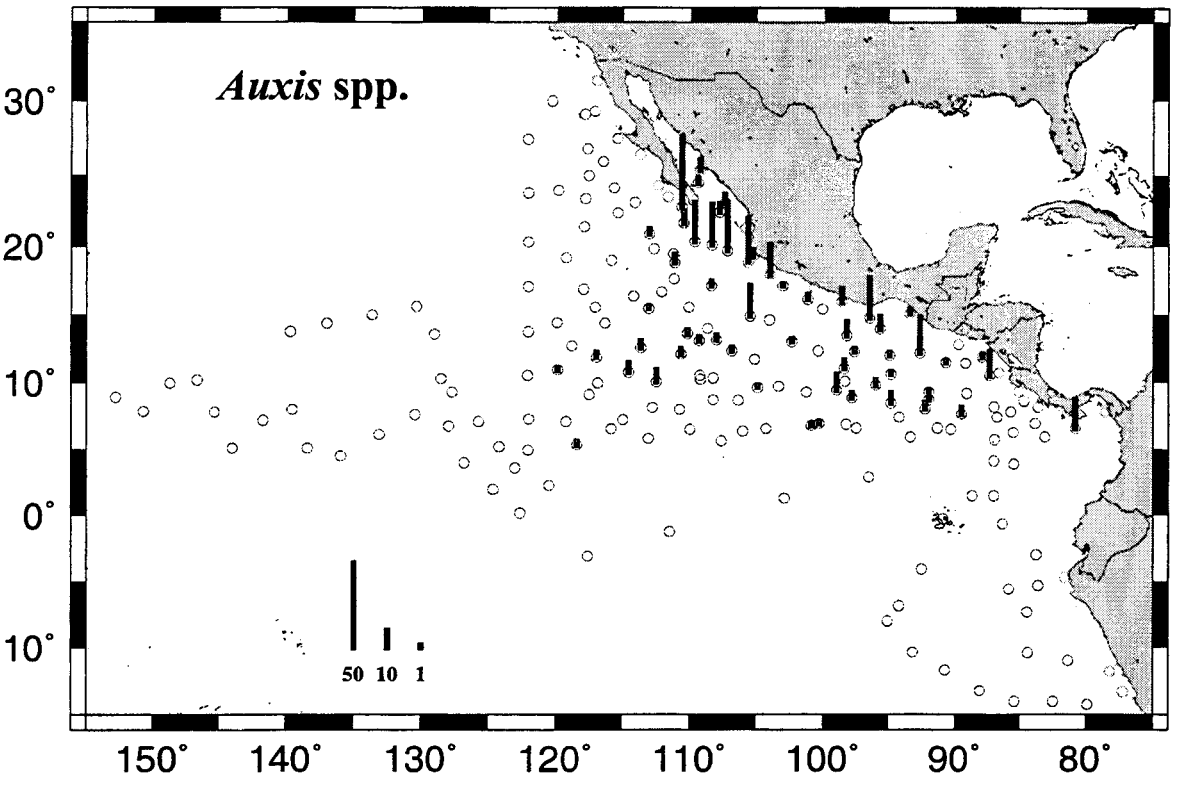

Figure 6. Distribution of *Auxis* spp. larvae from Manta net tows: 9910JD and 9910M4.

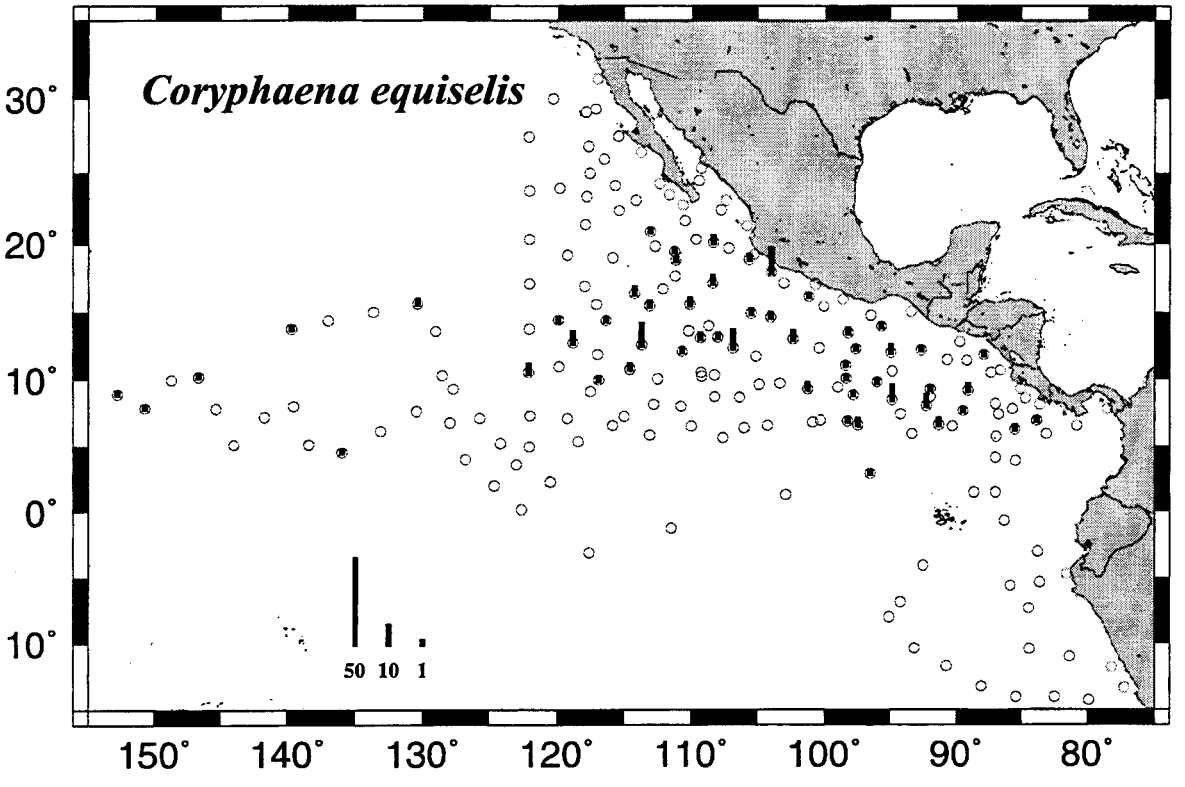

Figure 7. Distribution of *Coryphaena equiselis* larvae from Manta net tows: 9910JD and 9910M4.

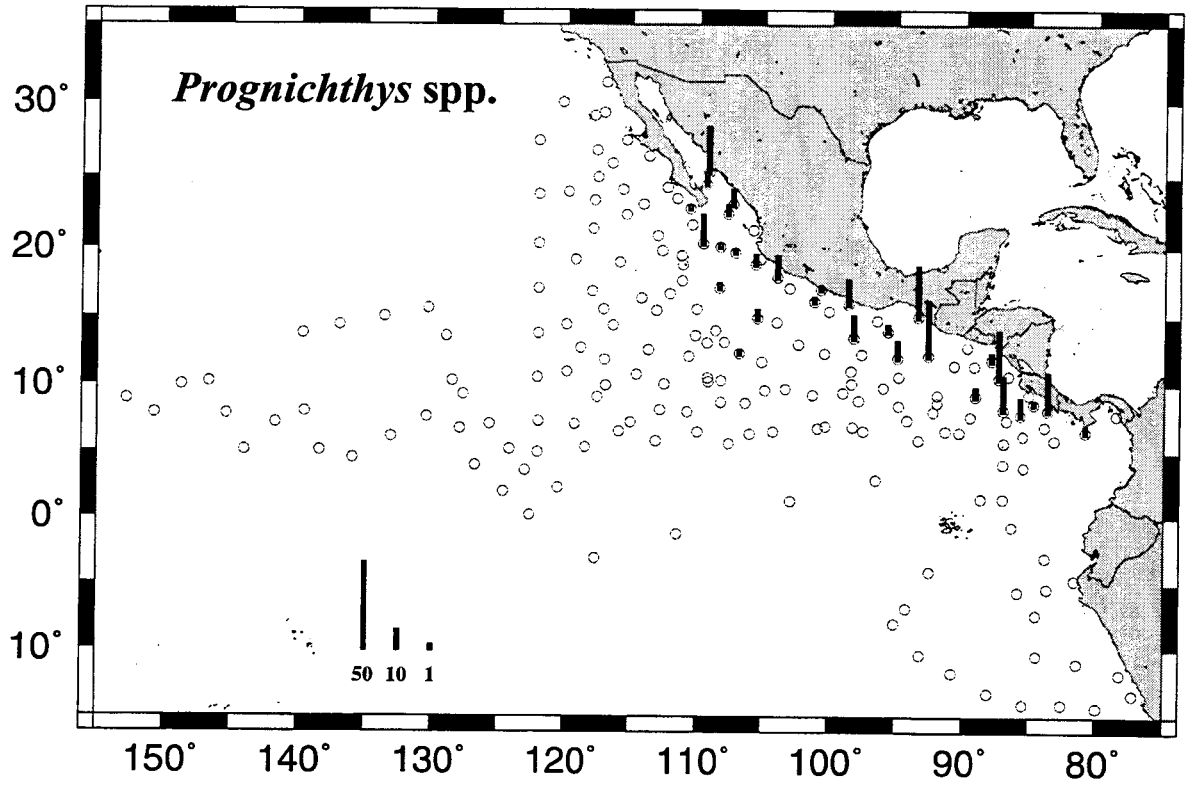

Figure 8. Distribution of *Prognichthys* spp. larvae from Manta net tows: 9910JD and 9910M4.

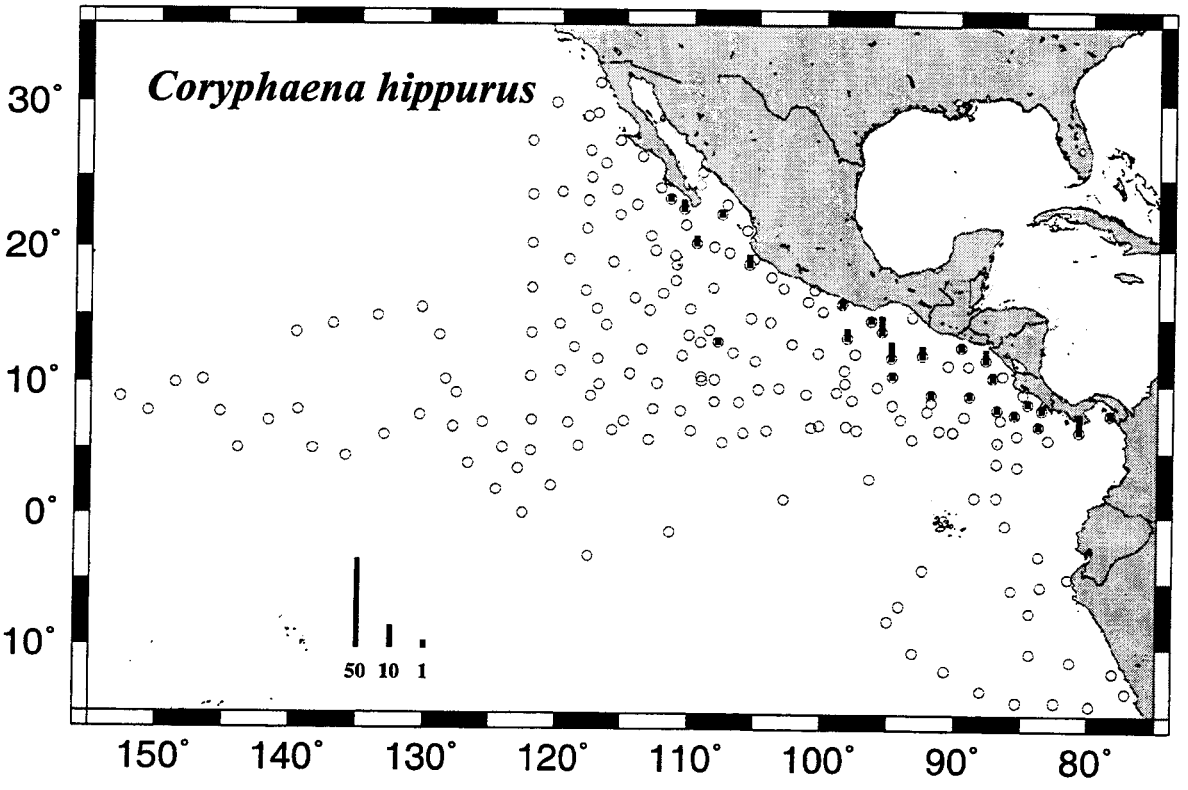

Figure 9. Distribution of *Coryphaena hippurus* larvae from Manta net tows: 9910JD and 9910M4.

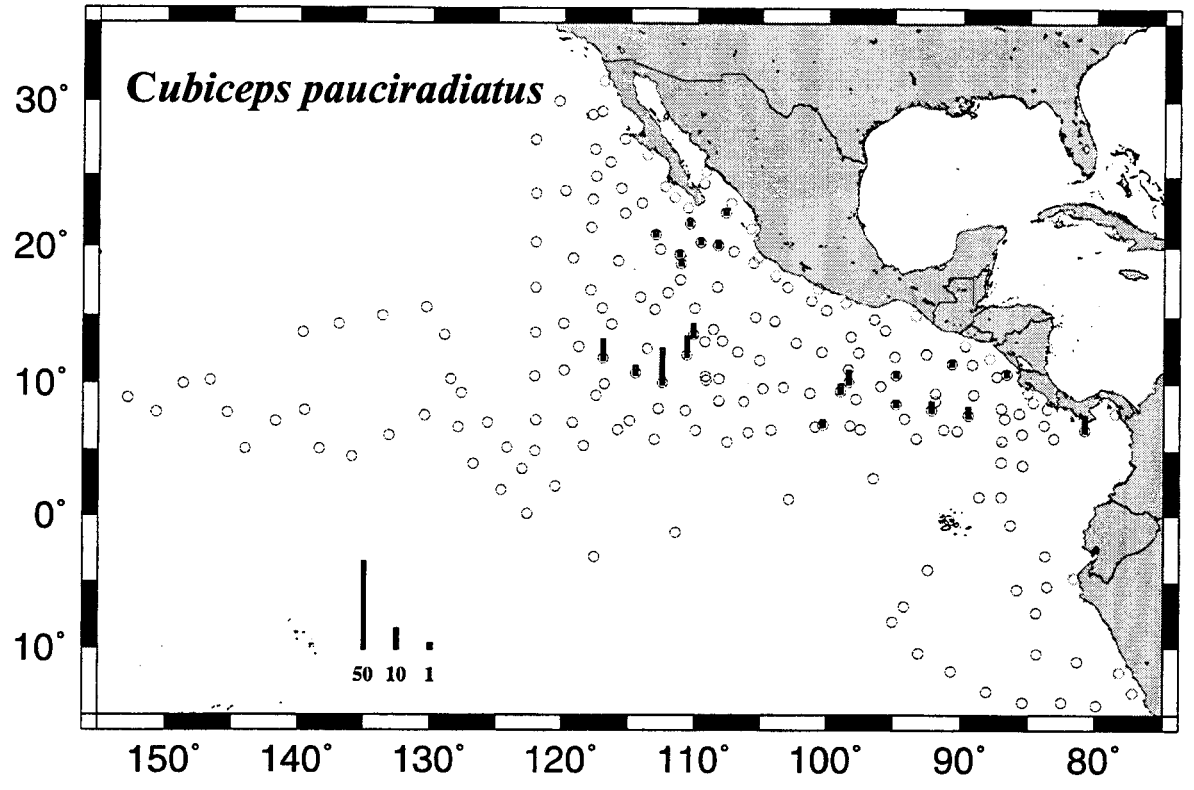

Figure 10. Distribution of *Cubiceps pauciradiatus* larvae from Manta net tows: 9910JD and 9910M4.

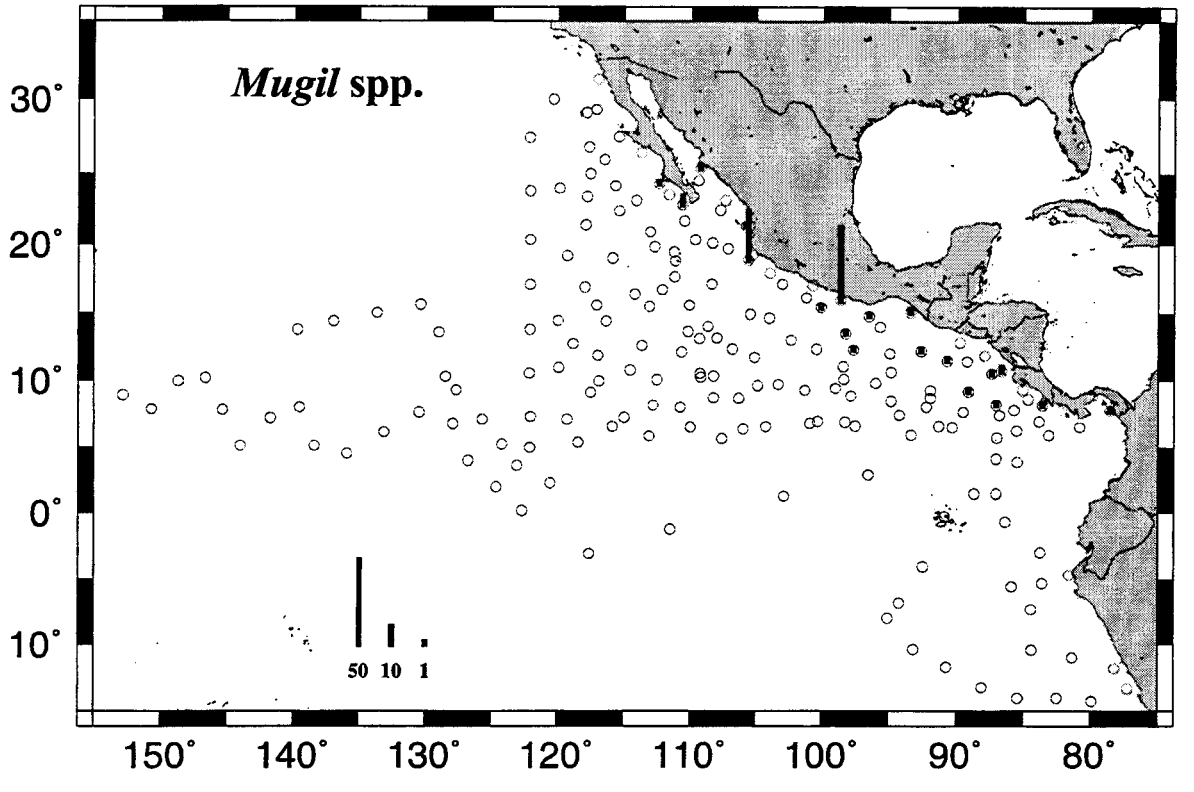

Figure 11. Distribution of *Mugil* spp. larvae from Manta net tows: 9910JD and 9910M4.

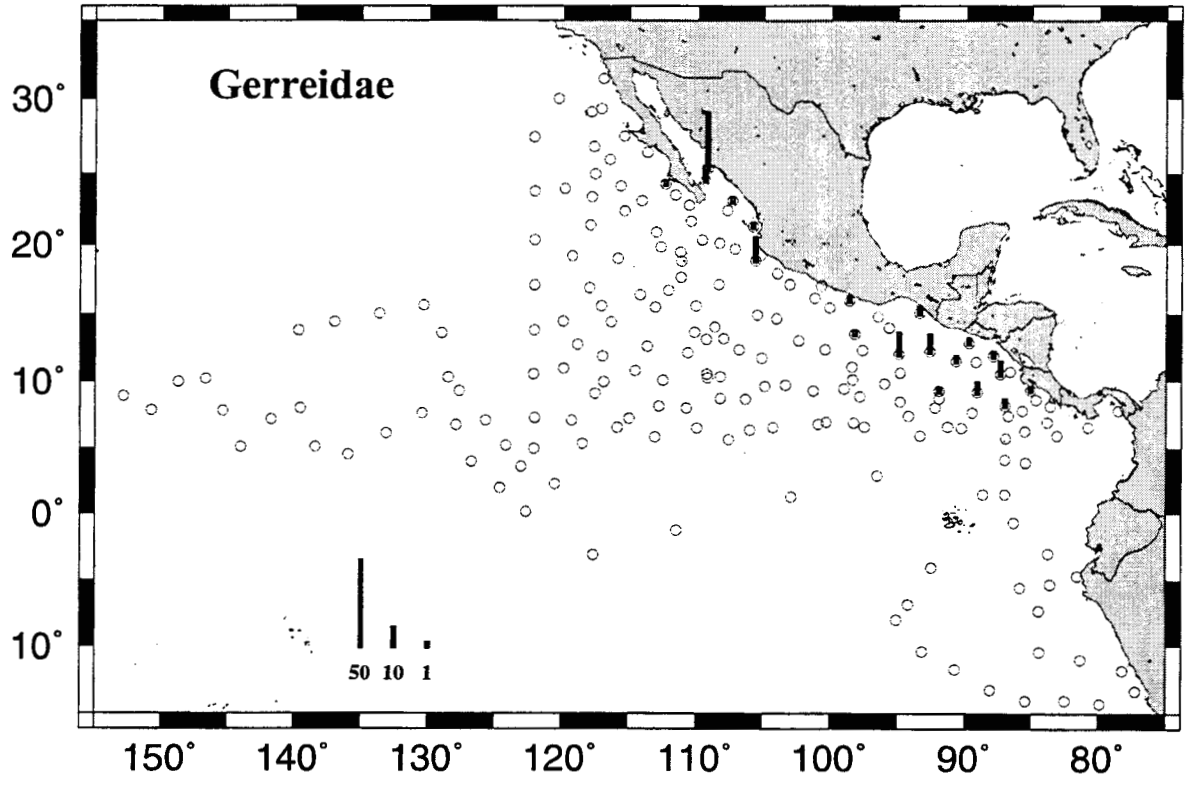

Figure 12. Distribution of Gerreidae larvae from Manta net tows: 9910JD and 9910M4.

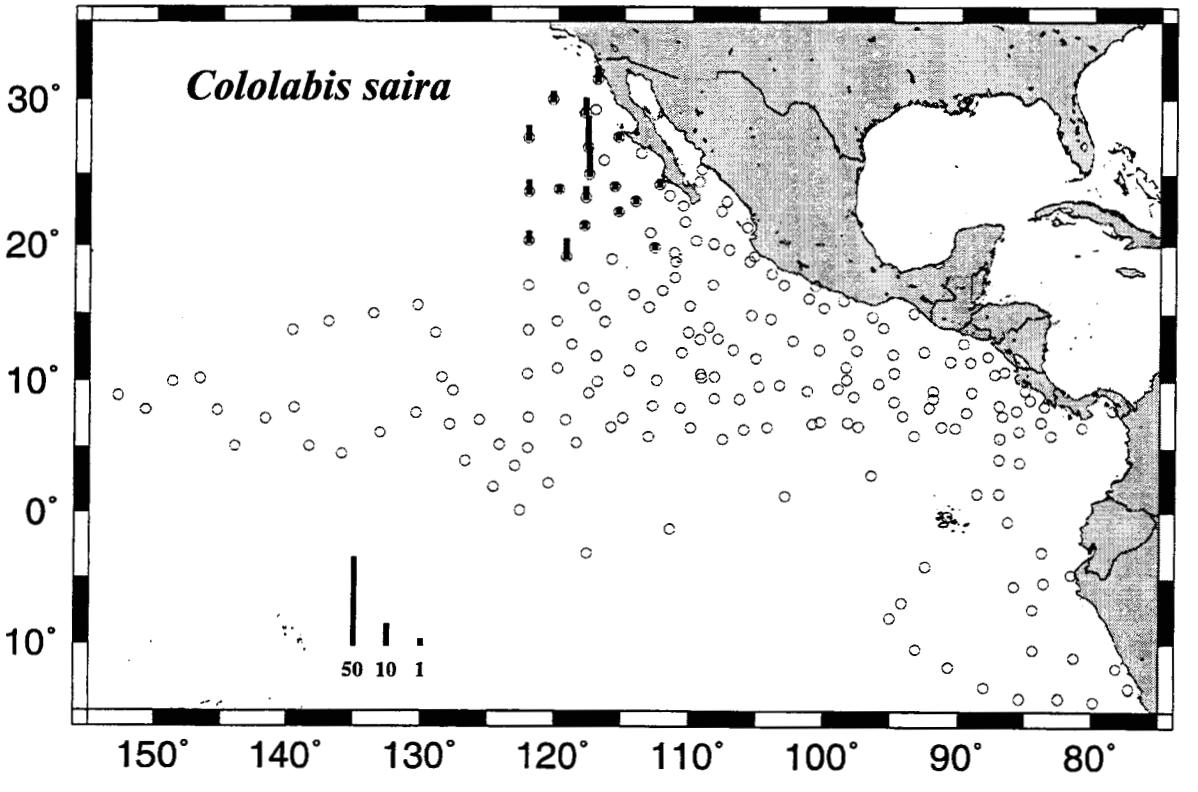

Figure 13. Distribution of *Cololabis saira* larvae from Manta net tows: 9910JD and 9910M4.

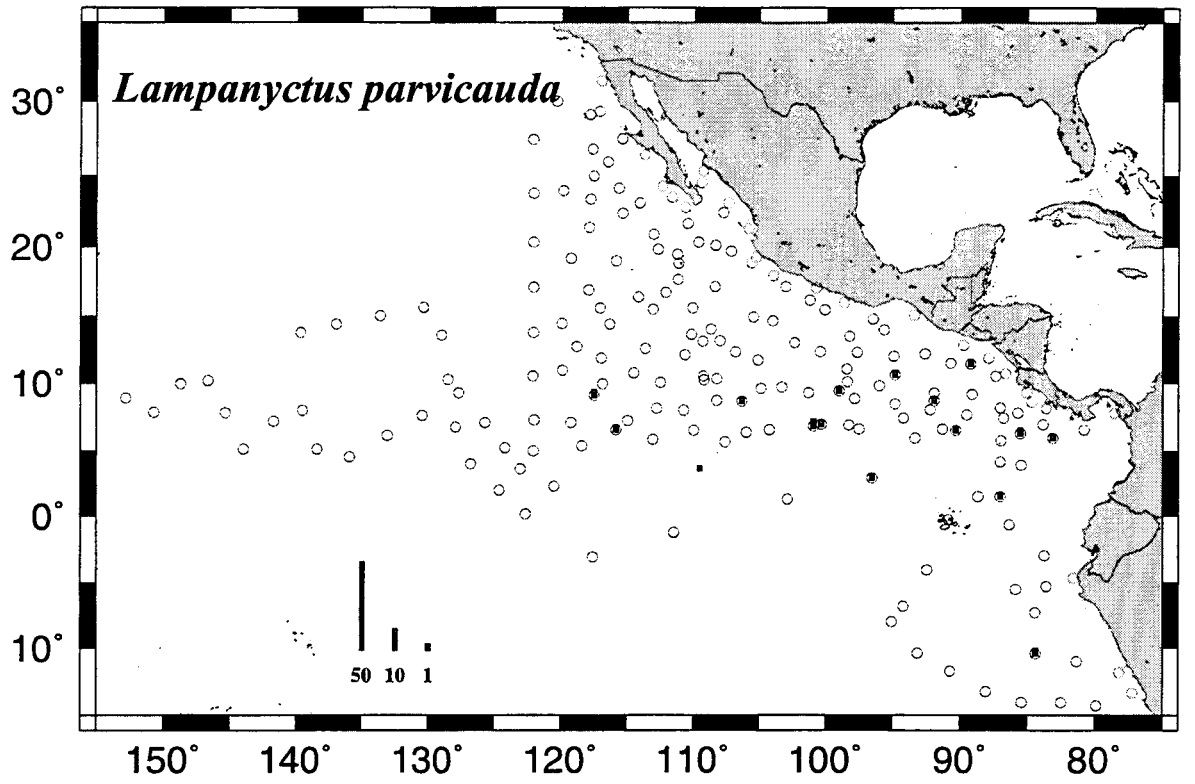

Figure 14. Distrbution of *Lampanyctus parvicauda* larvae from Manta net tows: 9910JD and 9910M4.

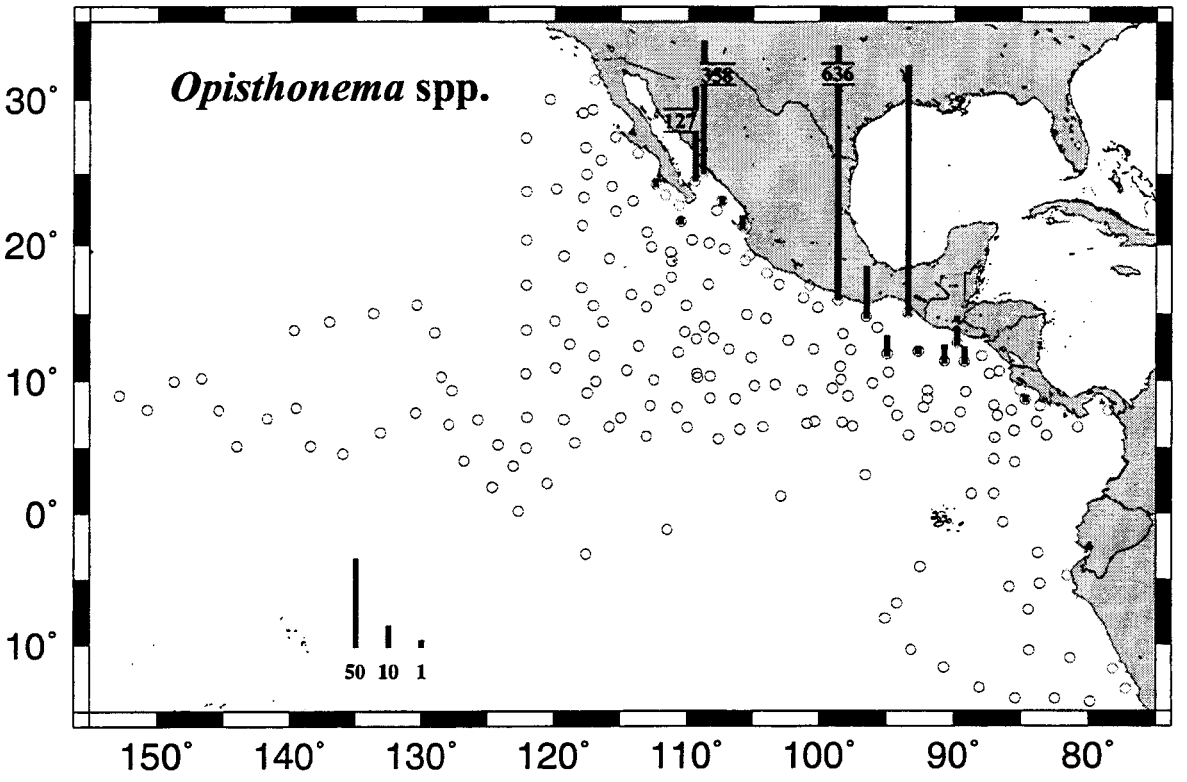

Figure 15. Distrbution of *Opisthonema* spp. larvae from Manta net tows: 9910JD and 9910M4.

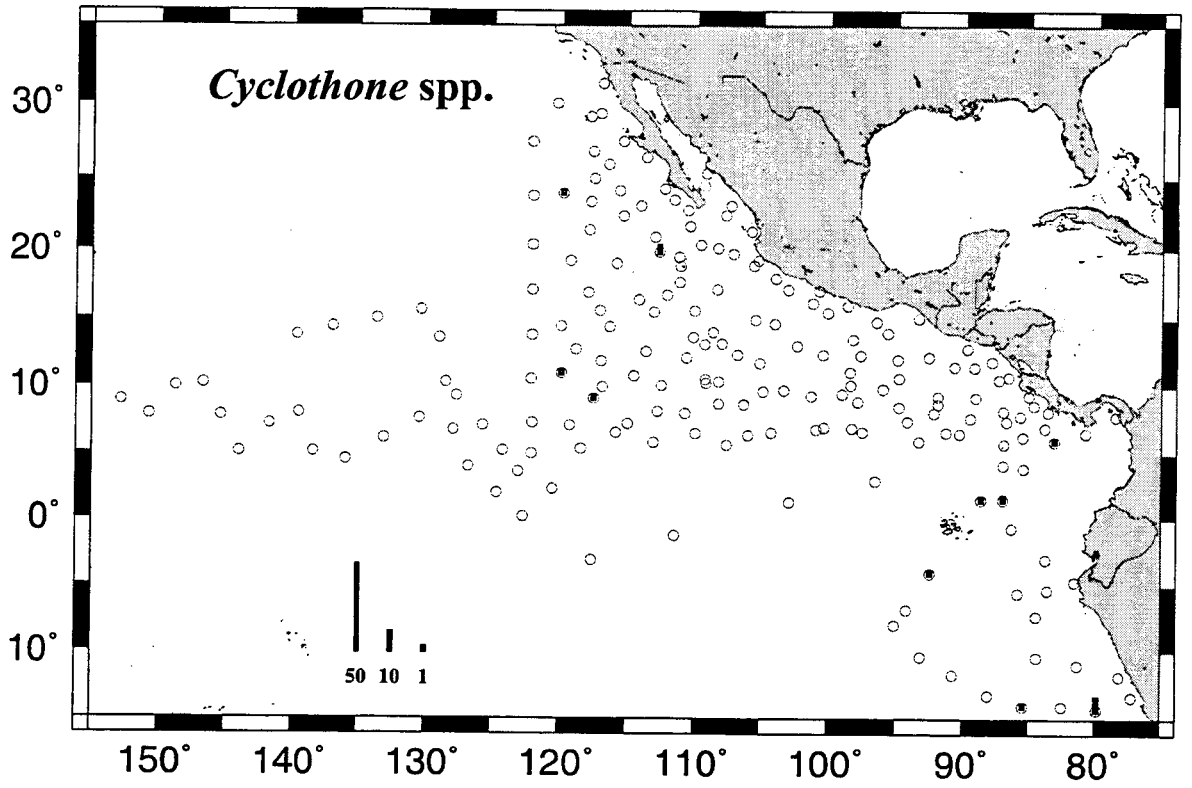

Figure 16. Distribution of *Cyclothone* spp. larvae from Manta net tows: 9910JD and 9910M4.

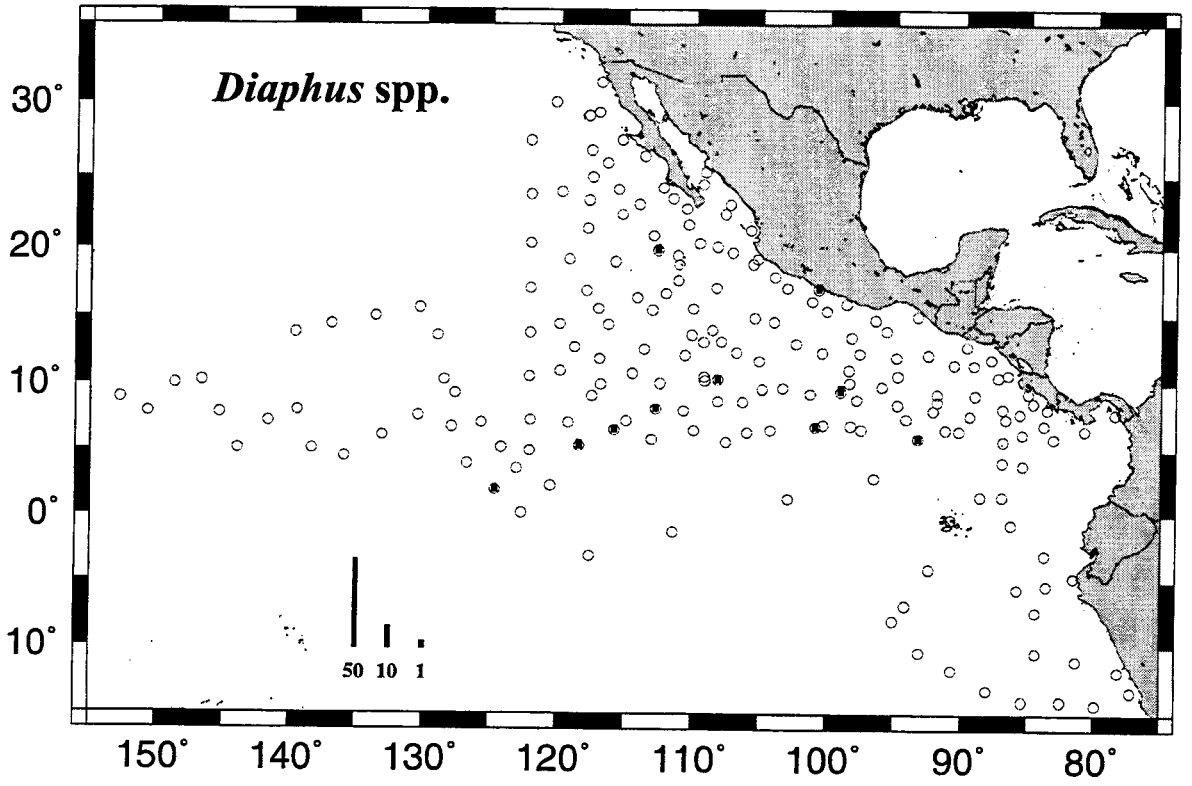

Figure 17. Distribution of *Diaphus* spp. larvae from Manta net tows: 9910JD and 9910M4.

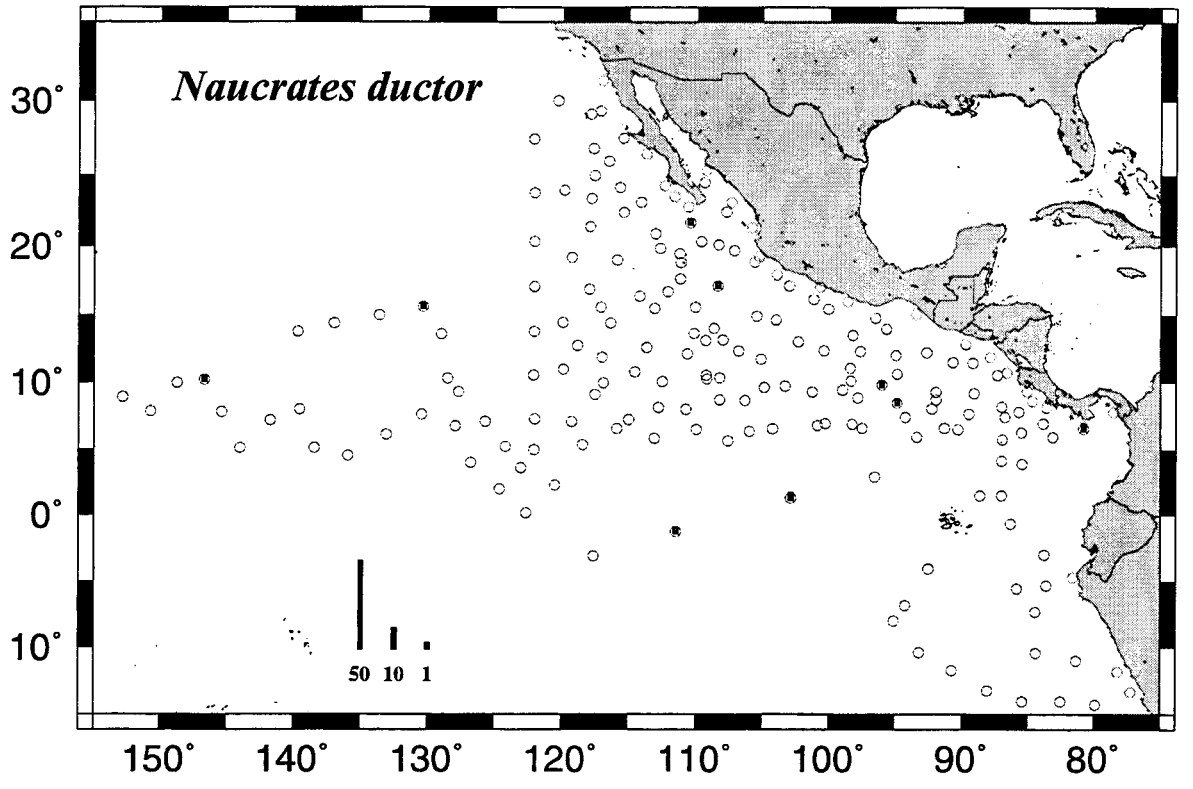

Figure 18. Distribution of *Naucrates ductor* larvae from Manta net tows: 9910JD and 9910M4.

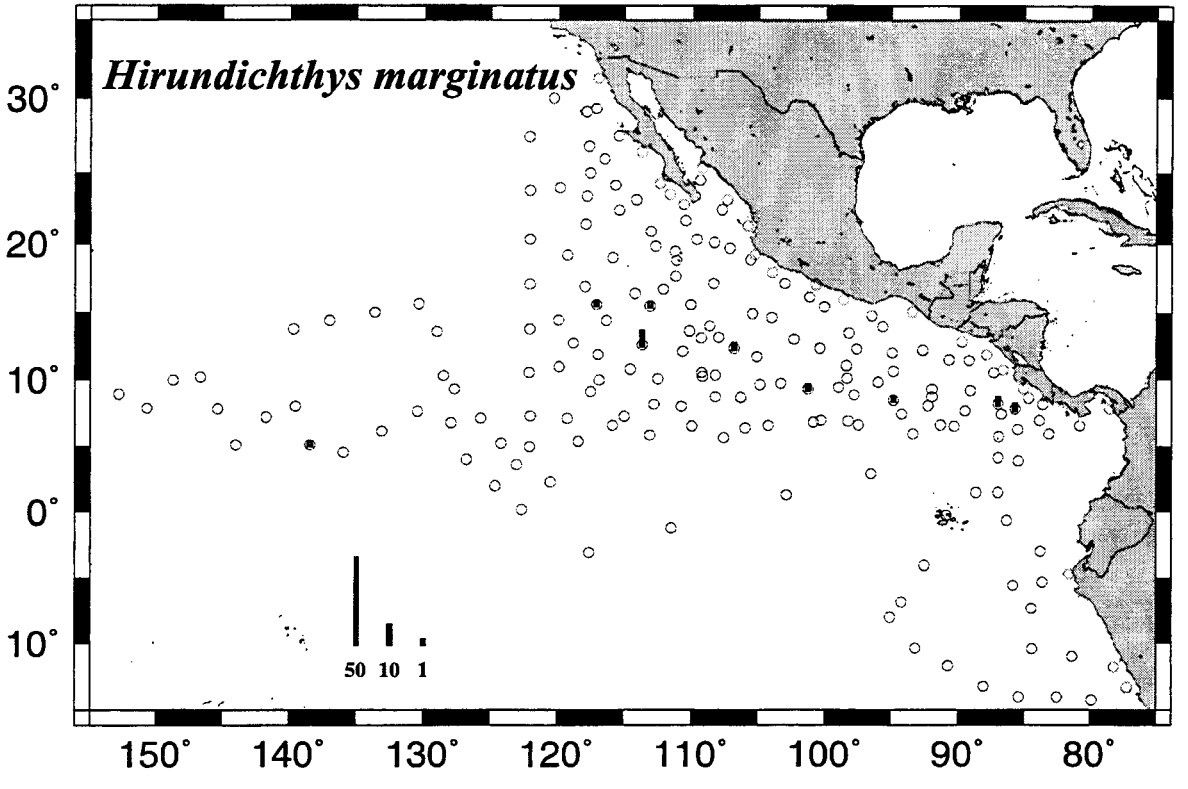

Figure 19. Distribution of *Hirundichthys marginatus* larvae from Manta net tows: 9910JD and 9910M4.

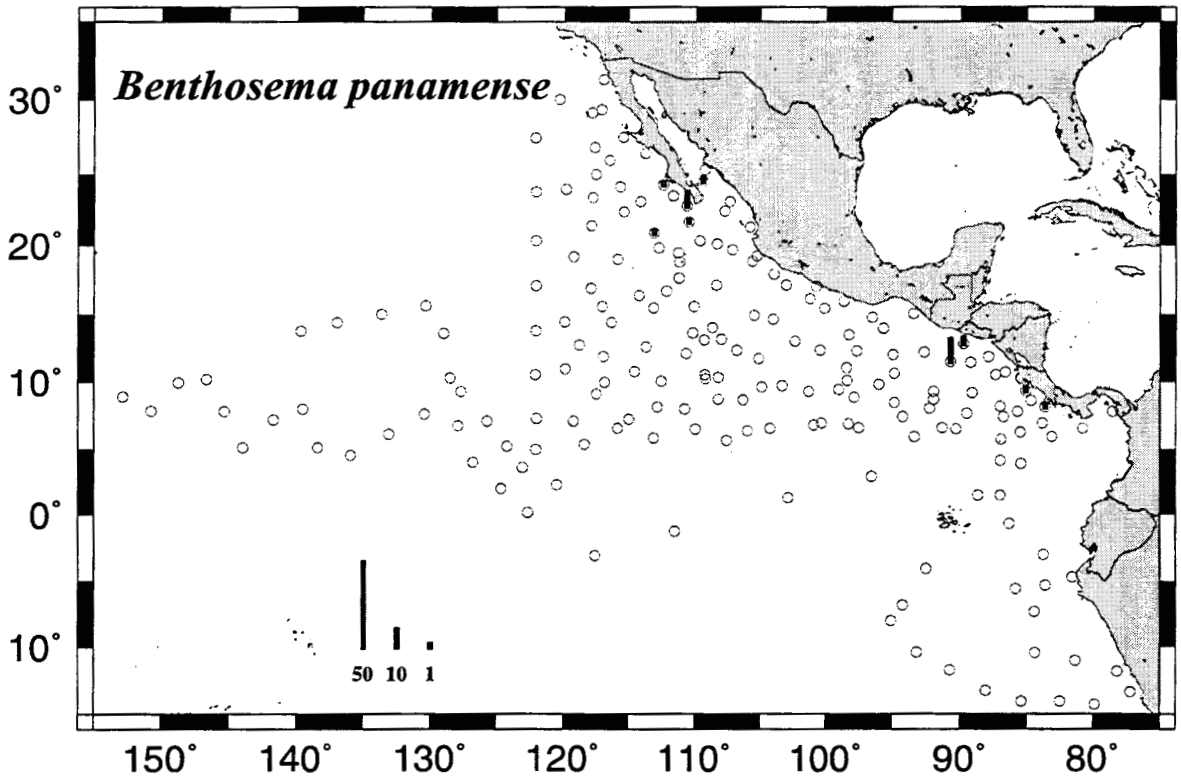

Figure 20. Distribution of *Benthosema panamense* larvae from Manta net tows: 9910JD and 9910M4.

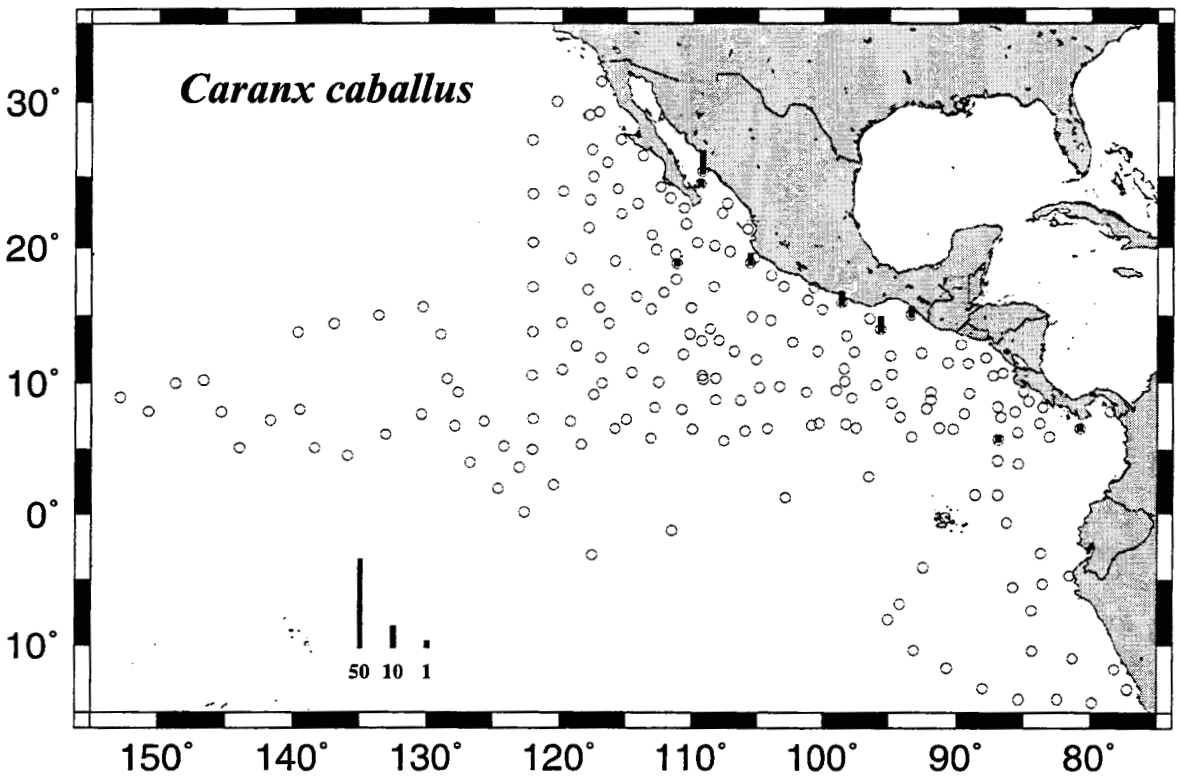

Figure 21. Distribution of *Caranx caballus* larvae from Manta net tows: 9910JD and 9910M4.

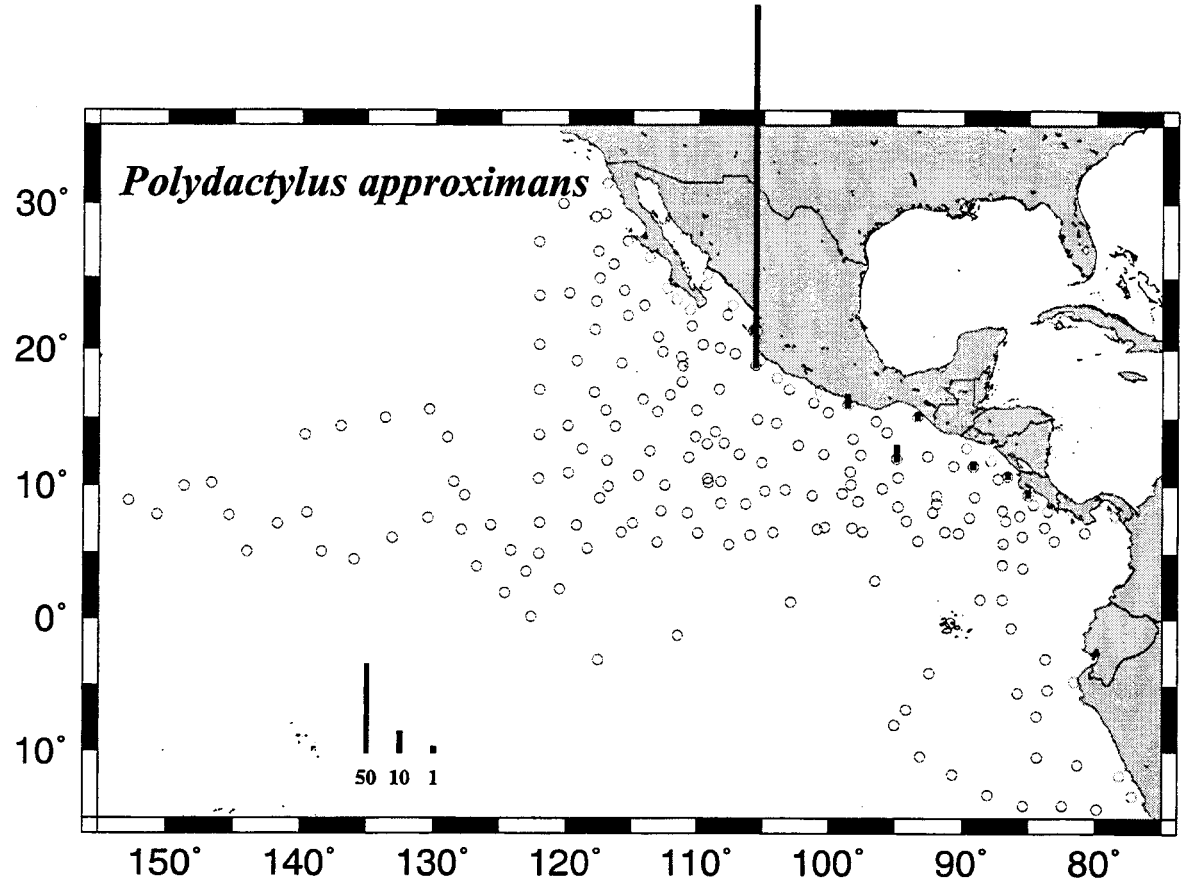

Figure 22. Distribution of *Polydactylus approximans* larvae from Manta net tows: 9910JD and 9910M4.

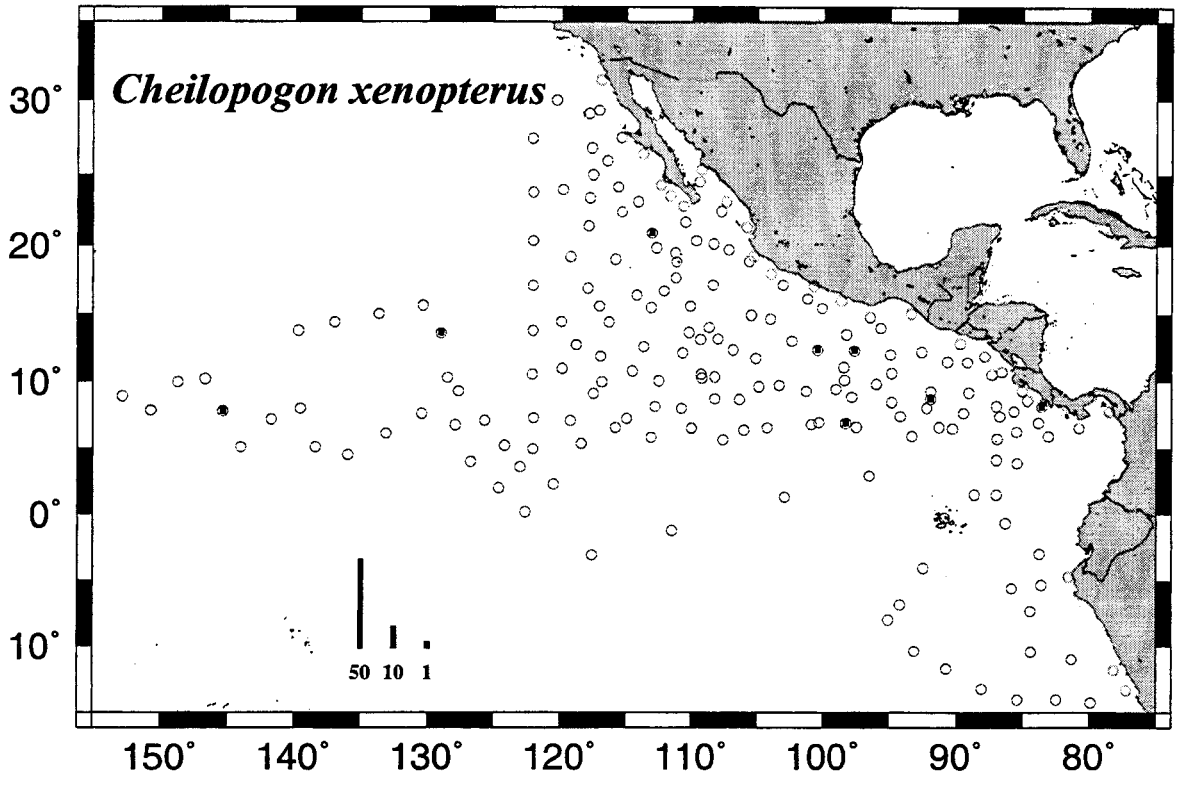

Figure 23. Distribution of *Cheilopogon xenopterus* larvae from Manta net tows: 9910JD and 9910M4.

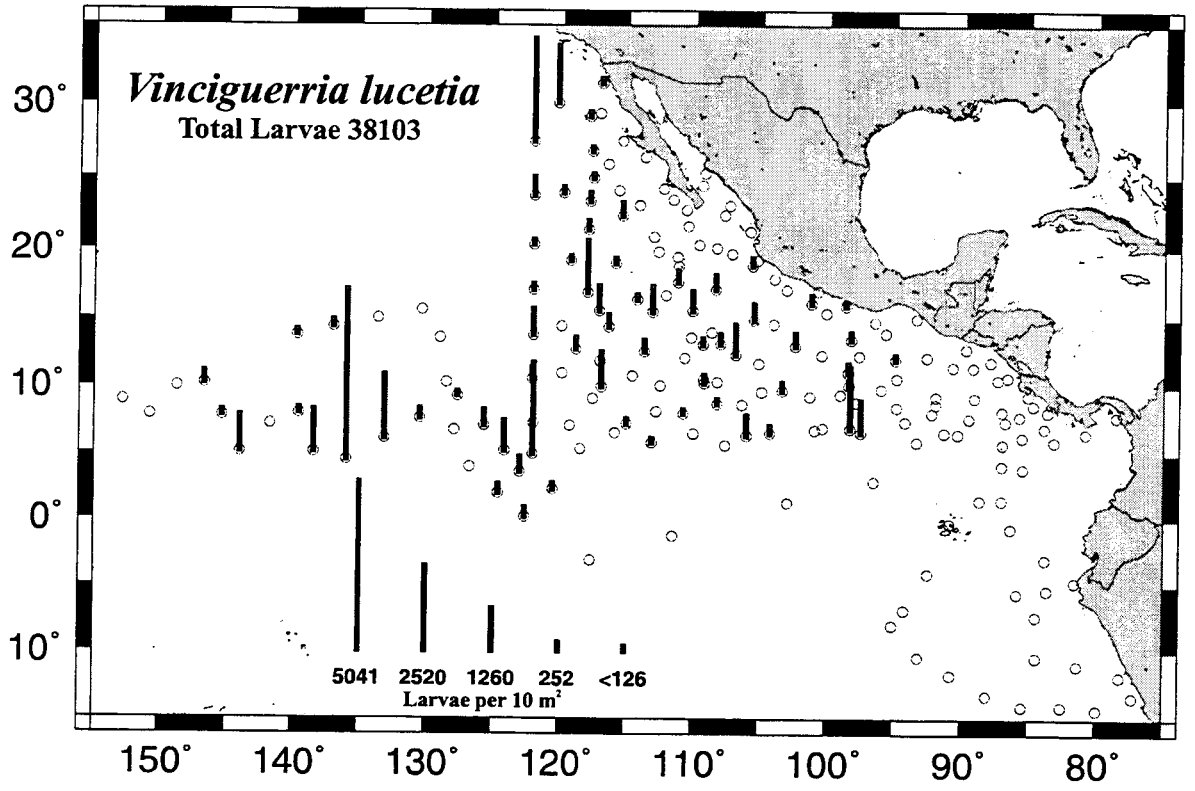

Figure 24. Distribution of *Vinciguerria lucetia* larvae from bongo net tows: 9910M4.

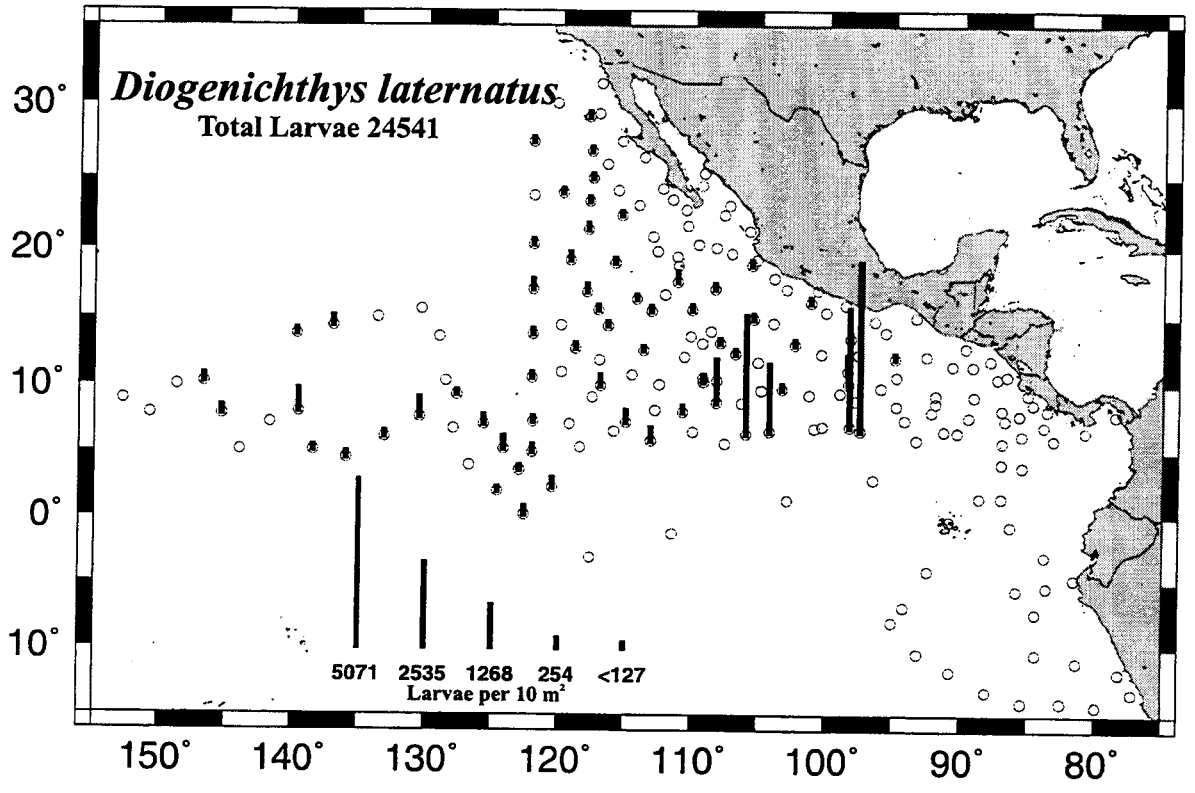

Figure 25. Distribution of *Diogenichthys laternatus* larvae from bongo net tows: 9910M4.

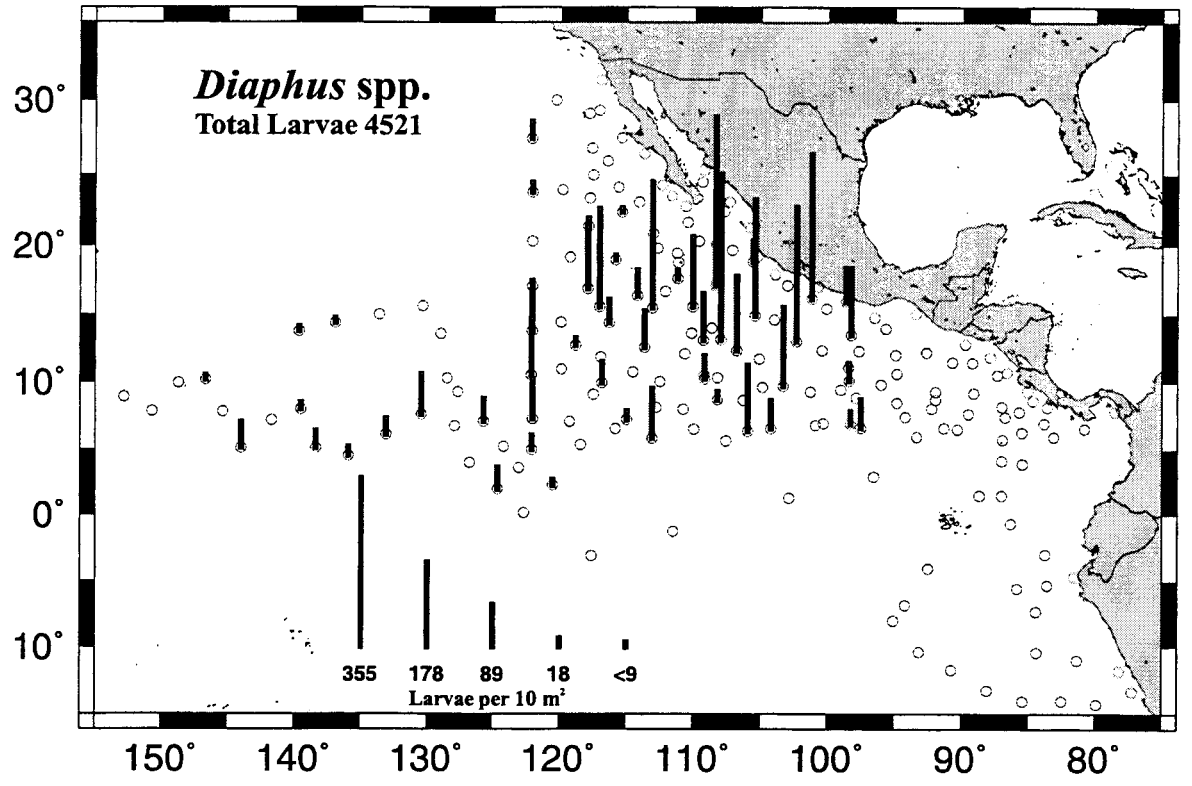

Figure 26. Distribution of *Diaphus* spp. larvae from bongo net tows: 9910M4.

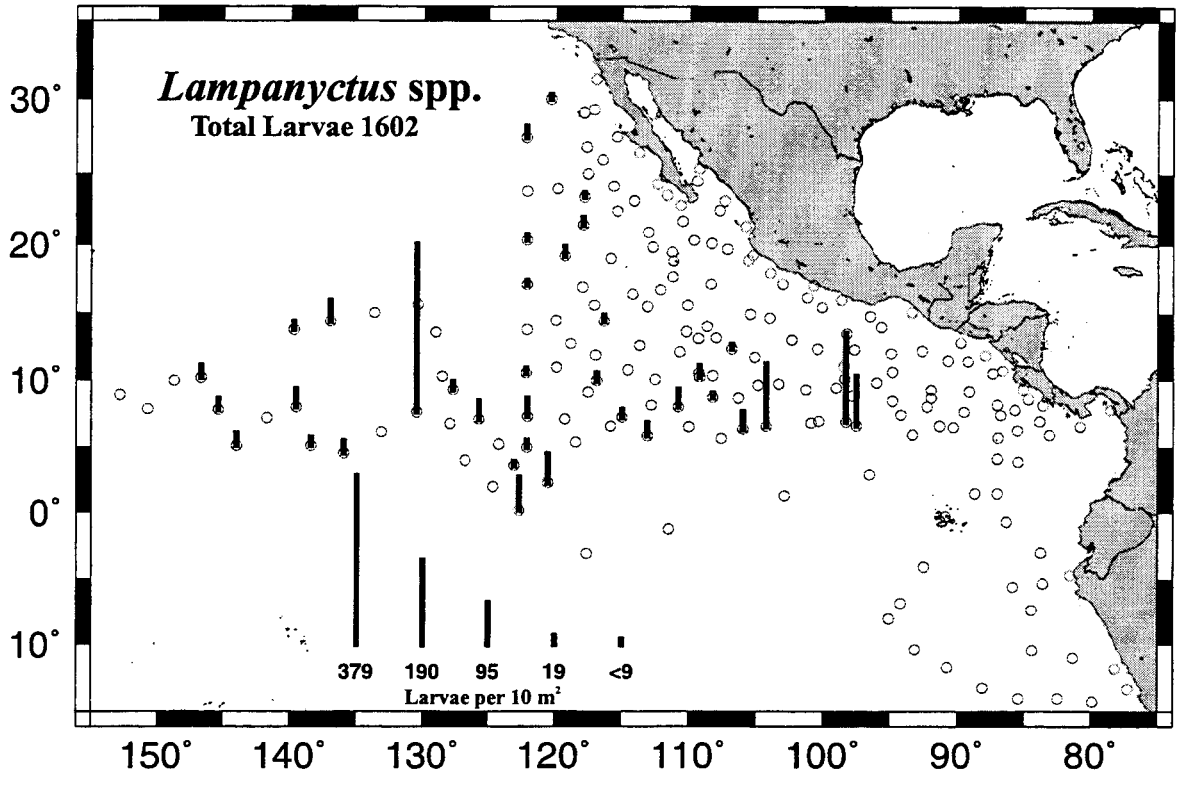

Figure 27. Distribution of *Lampanyctus* spp. larvae from bongo net tows: 9910M4.

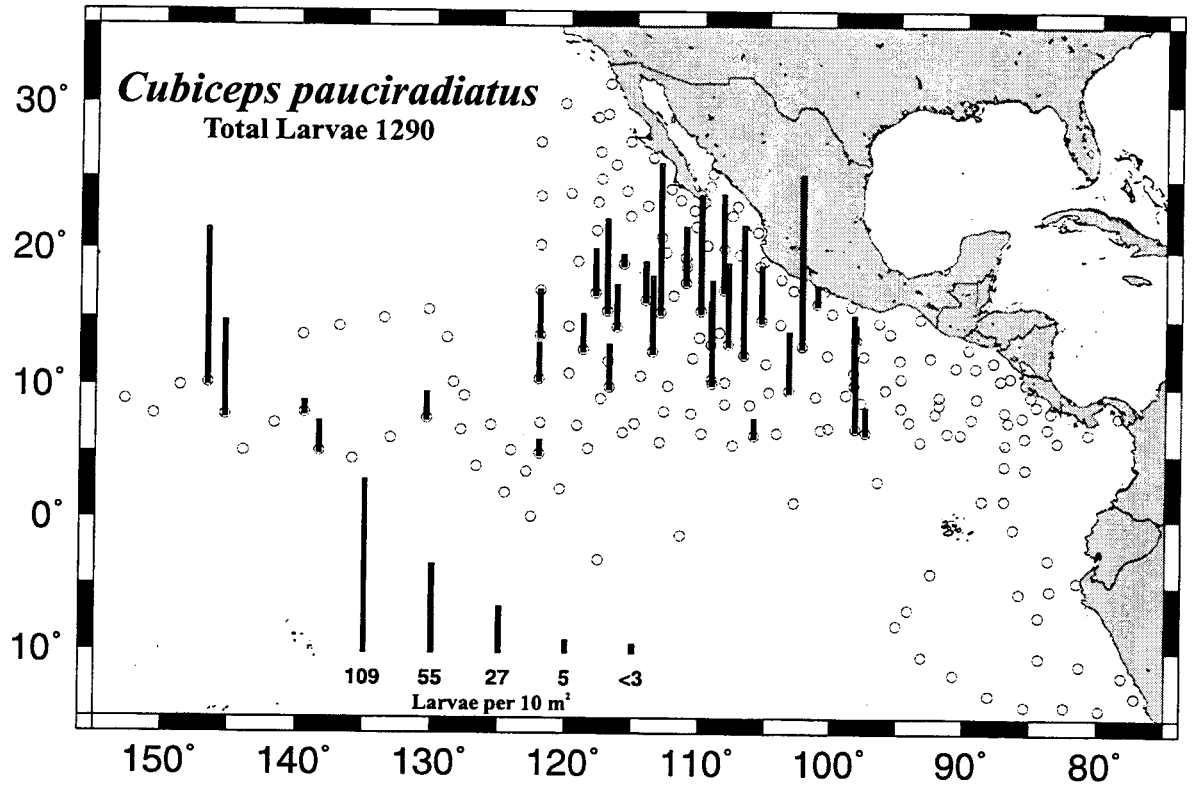

Figure 28. Distribution of *Cubiceps pauciradiatus* larvae from bongo net tows: 9910M4.

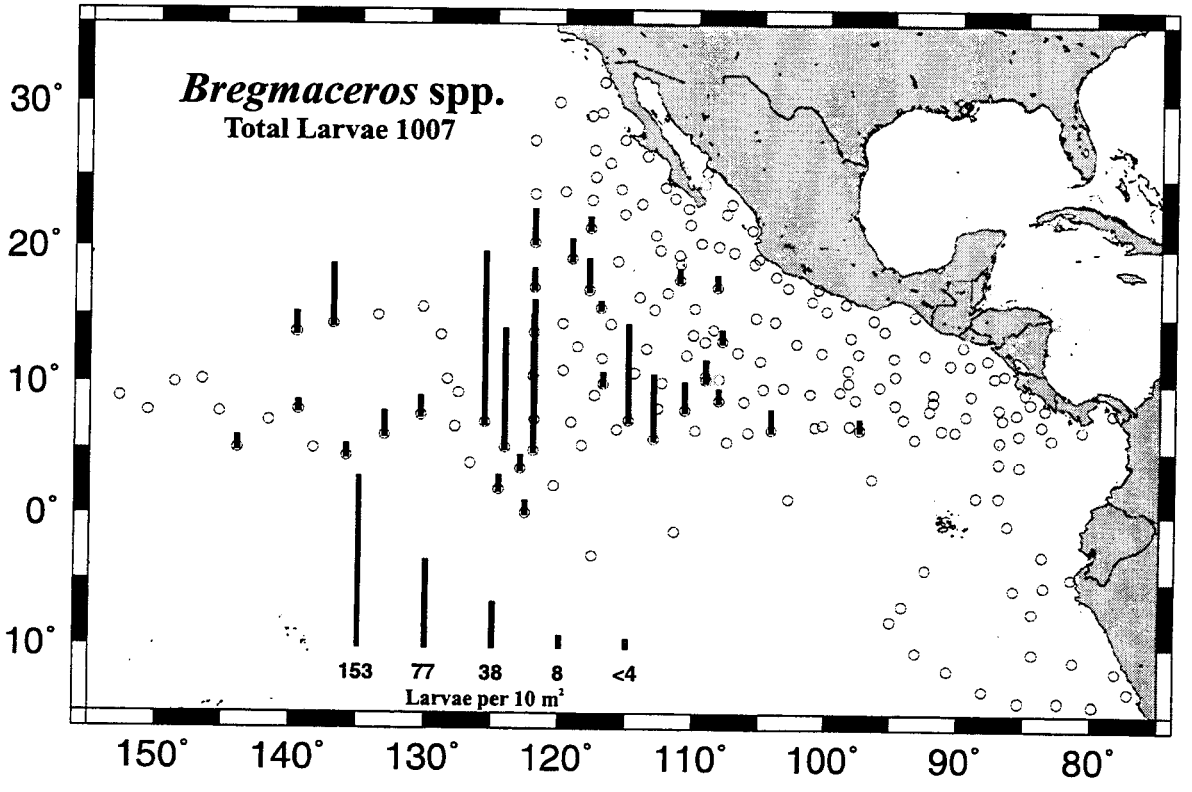

Figure 29. Distribution of *Bregmaceros* spp. larvae from bongo net tows: 9910M4.

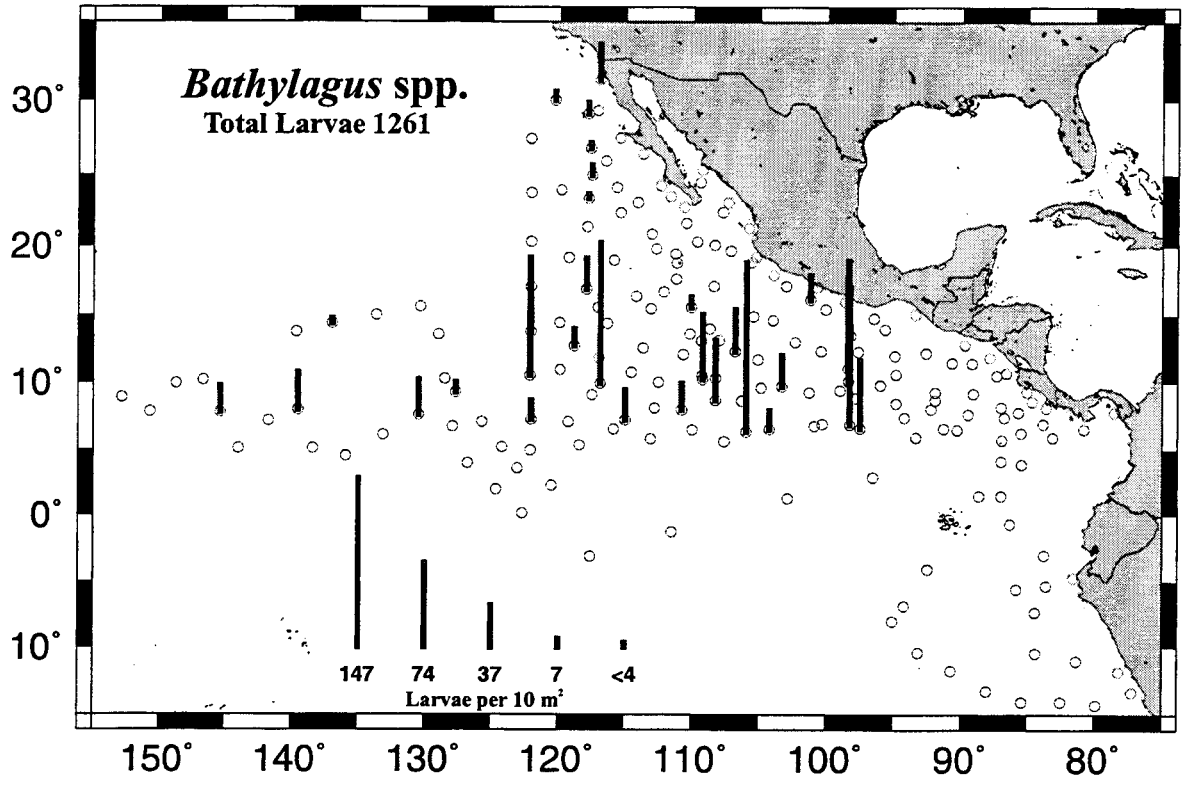

Figure 30. Distribution of *Bathylagus* spp. larvae from bongo net tows: 9910M4.

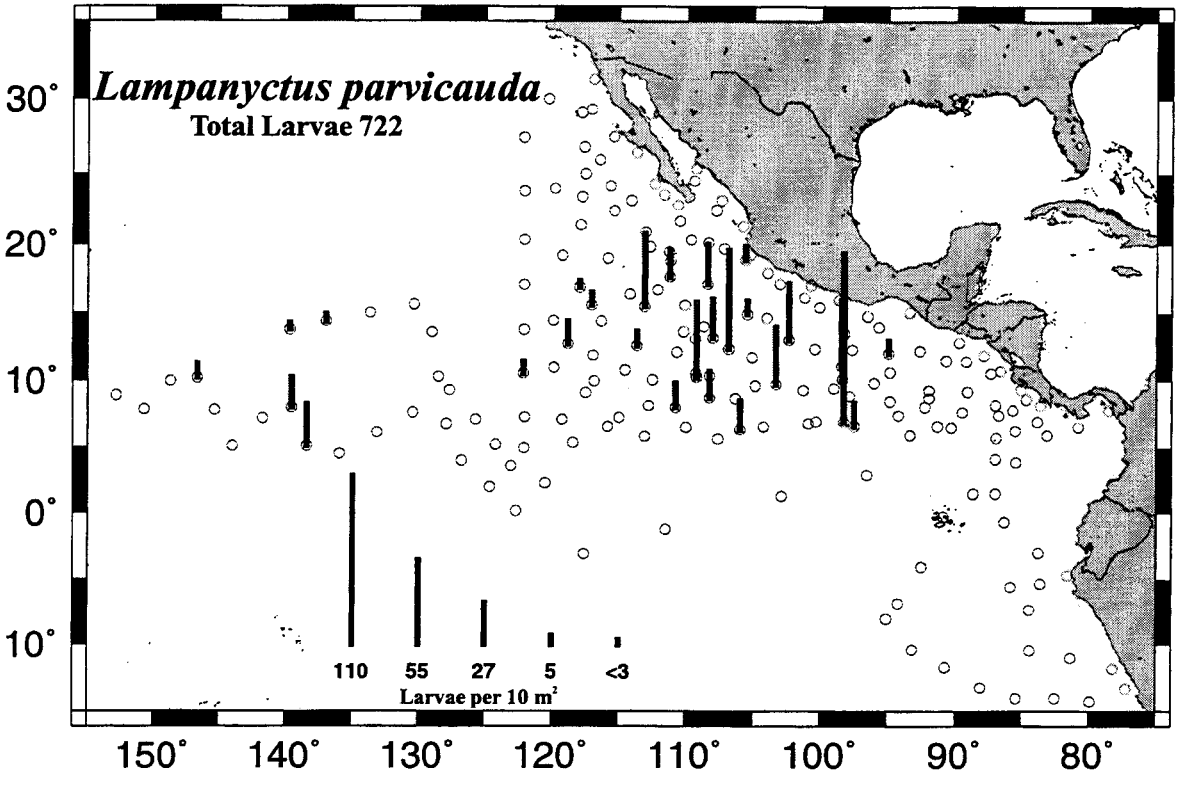

Figure 31. Distribution of *Lampanyctus parvicauda* larvae from bongo net tows: 9910M4.

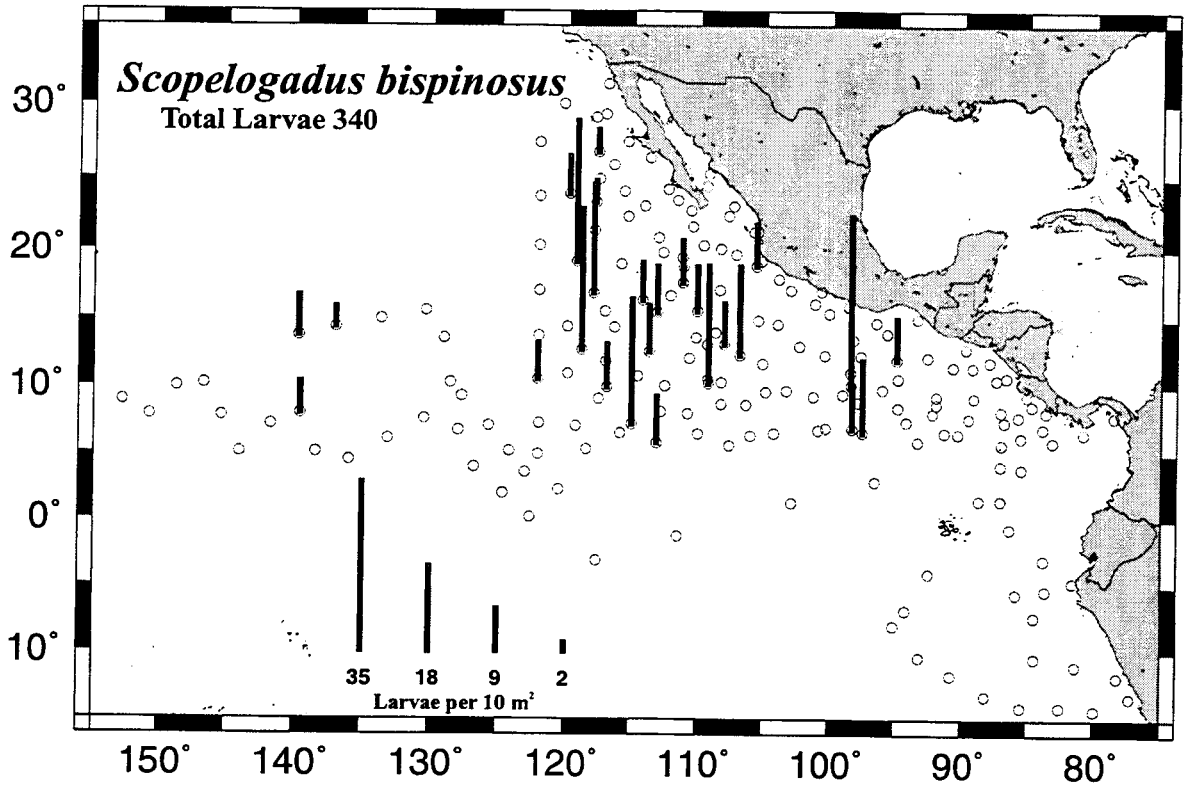

Figure 32. Distribution of *Scopelogadus bispinosus* larvae from bongo net tows: 9910M4.

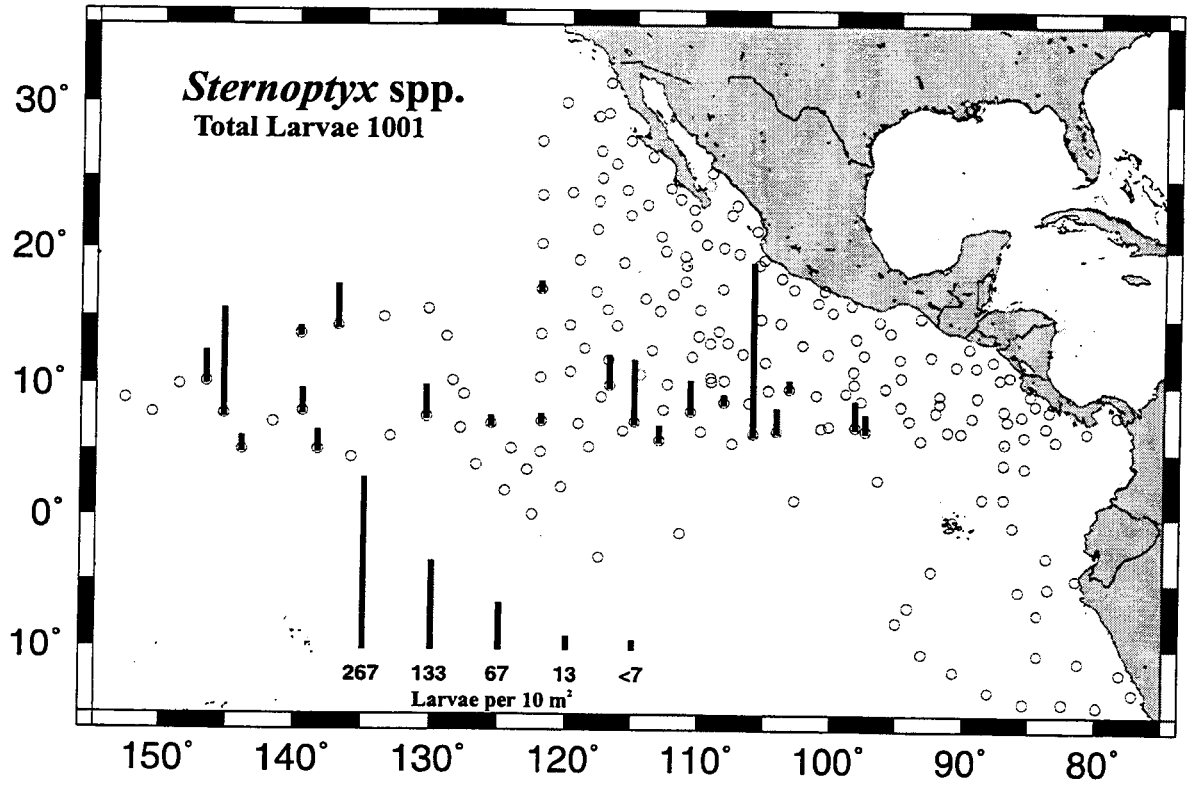

Figure 33. Distribution of *Sternoptyx* spp. larvae from bongo net tows: 9910M4.

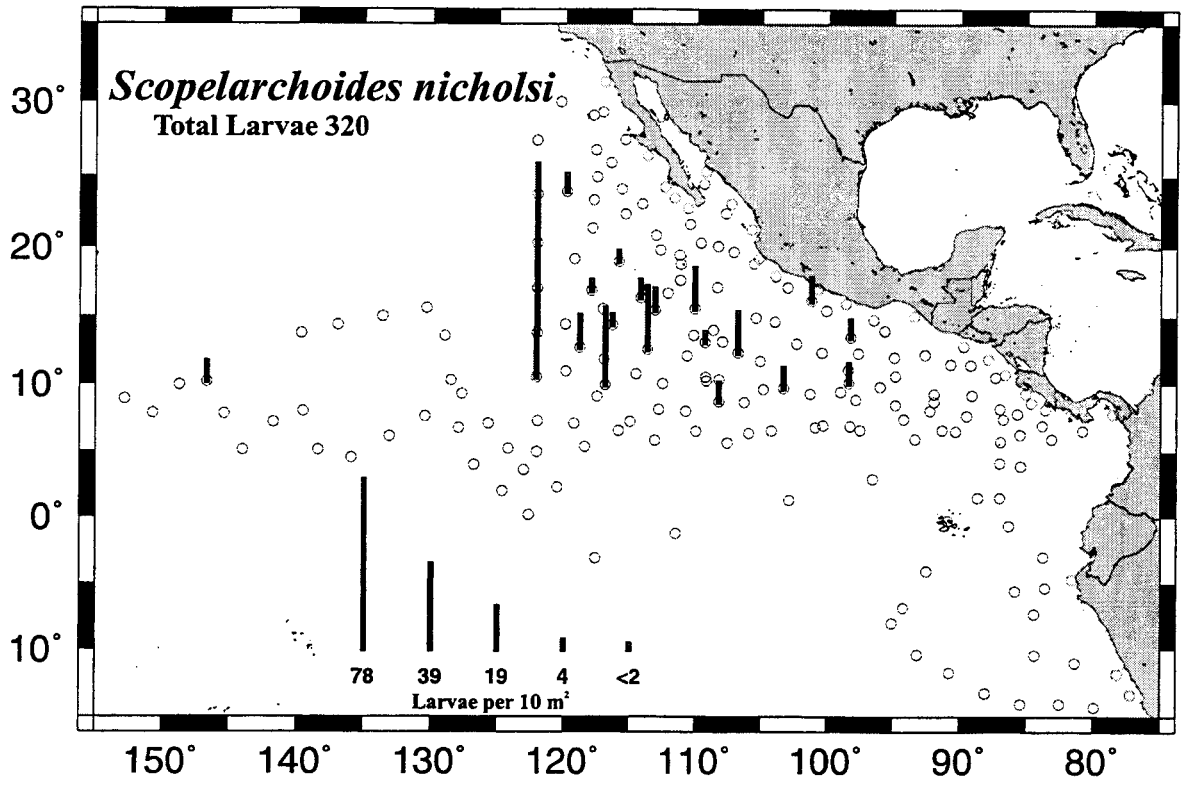

Figure 34. Distribution of *Scopelarchoides nicholsi* larvae from bongo tows: 9910M4.

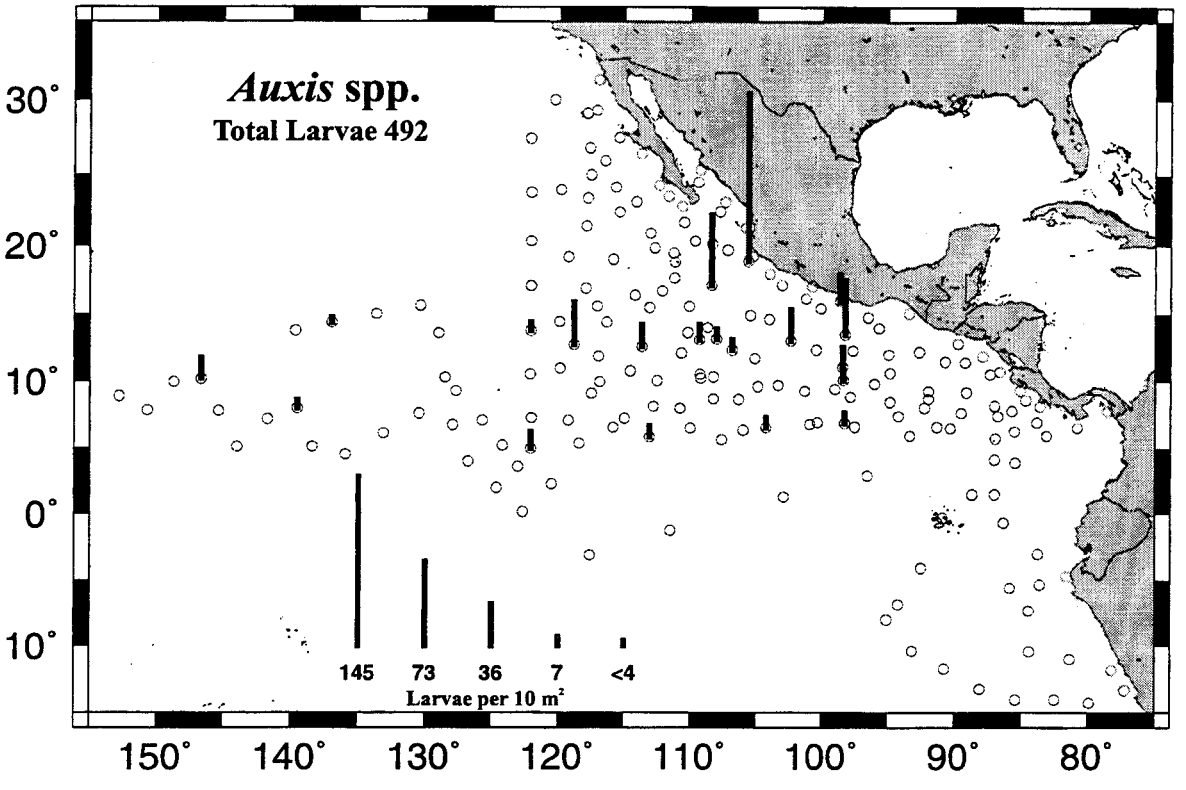

Figure 35. Distribution of *Auxis* spp. larvae from bongo tows: 9910M4.

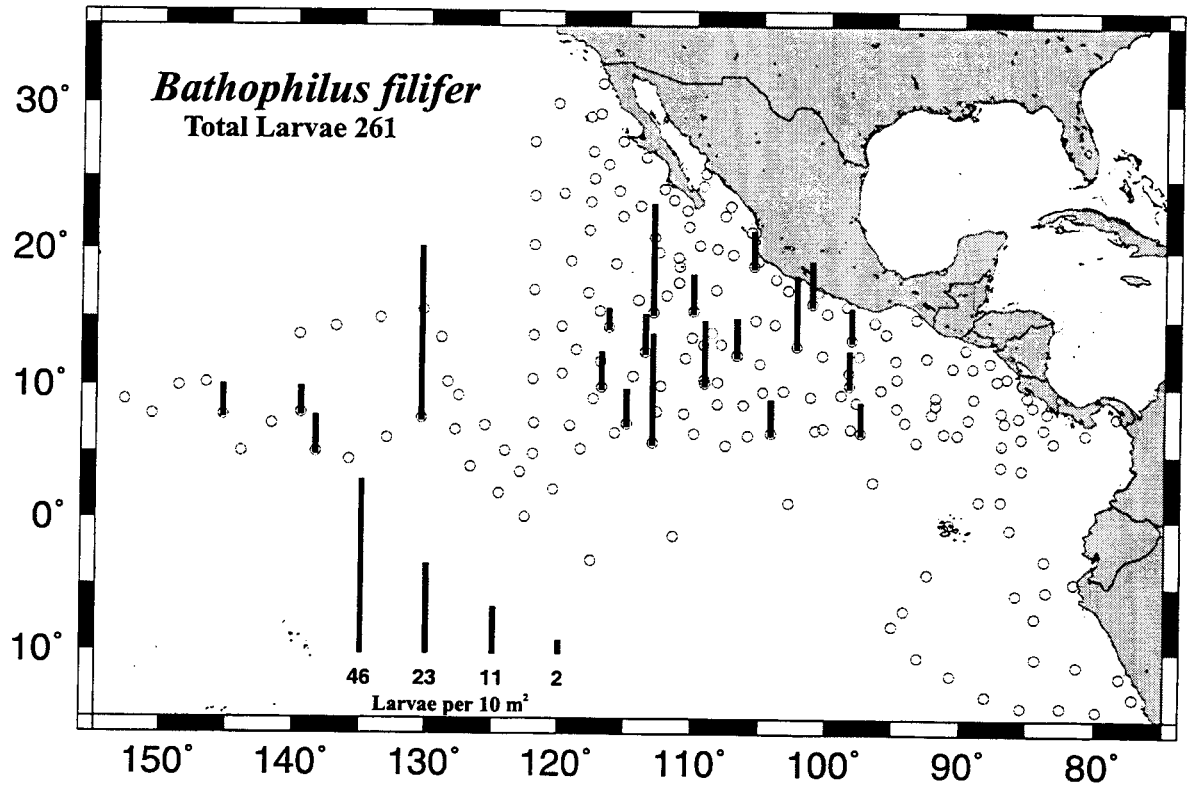

Figure 36. Distribution of *Bathophilus filifer* larvae from bongo net tows: 9910M4.

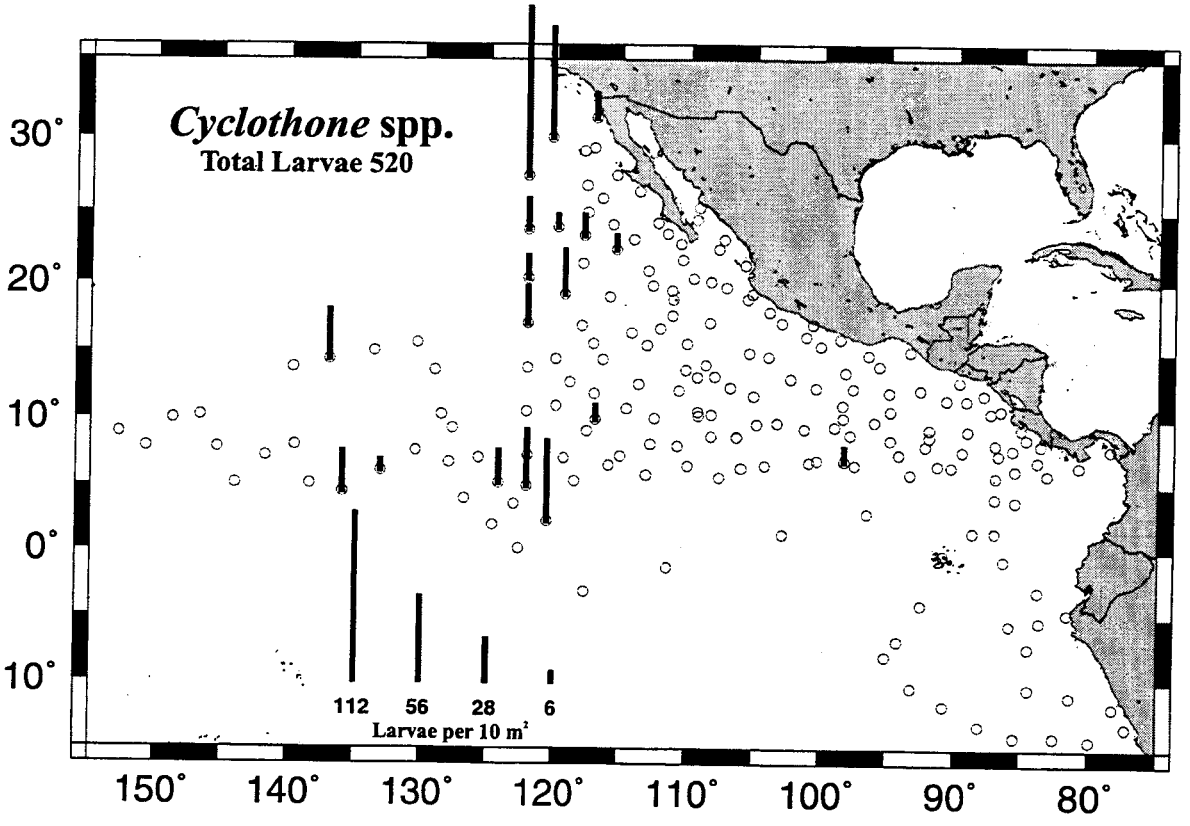

Figure 37. Distribution of *Cyclothone* spp. larvae from bongo net tows: 9910M4.

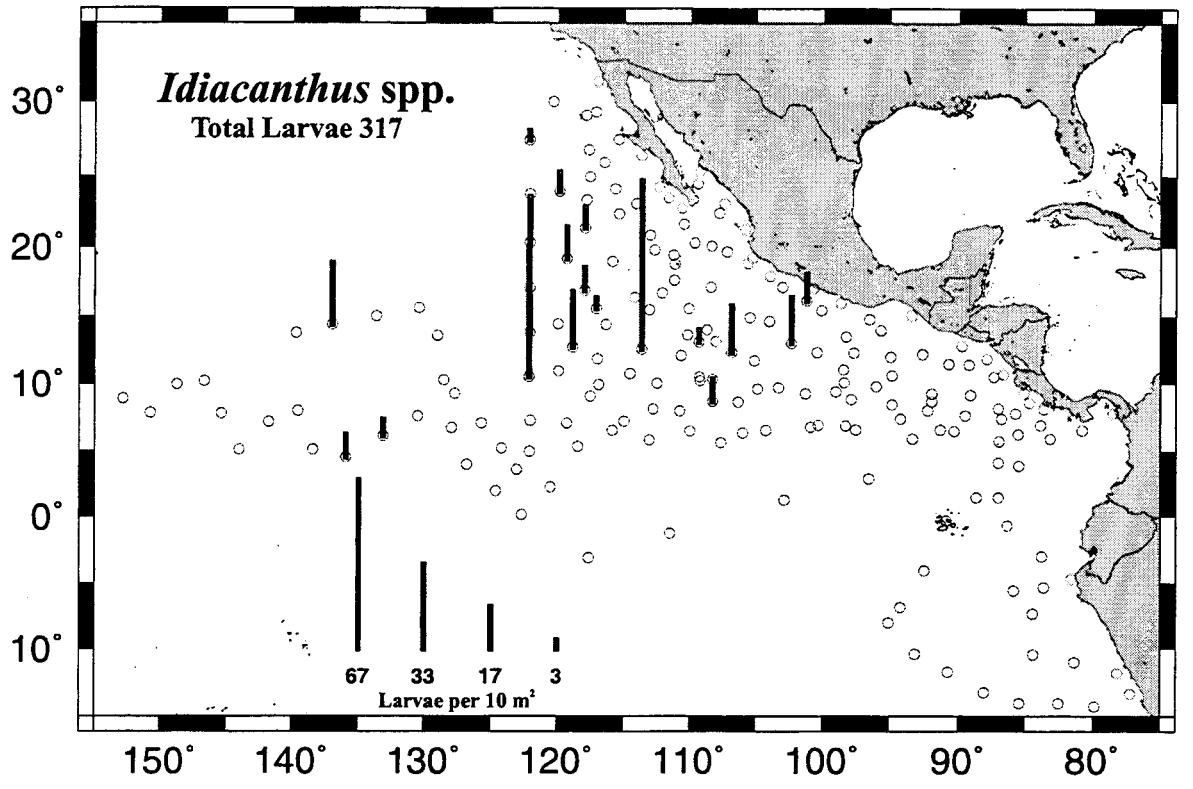

Figure 38. Distribution of *Idiacanthus* spp. larvae from bongo net tows: 9910M4.

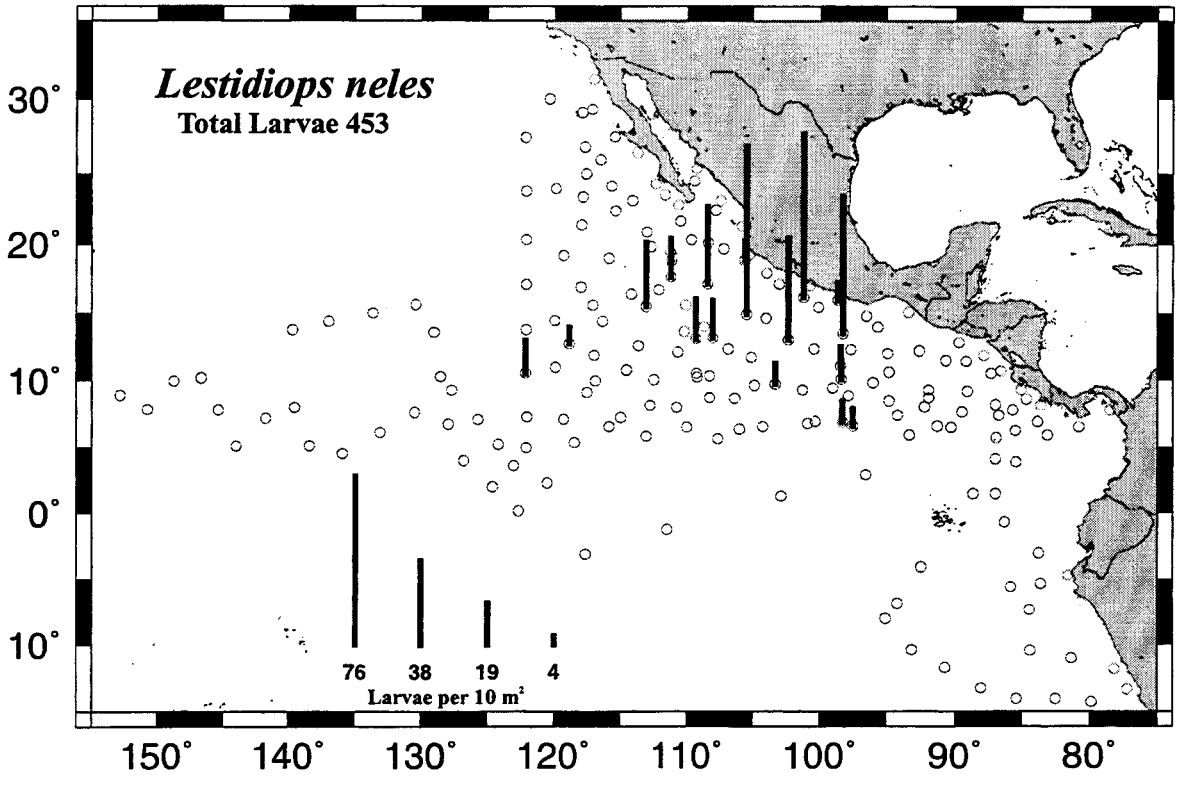

Figure 39. Distribution of *Lestidiops neles* larvae from bongo net tows: 9910M4.

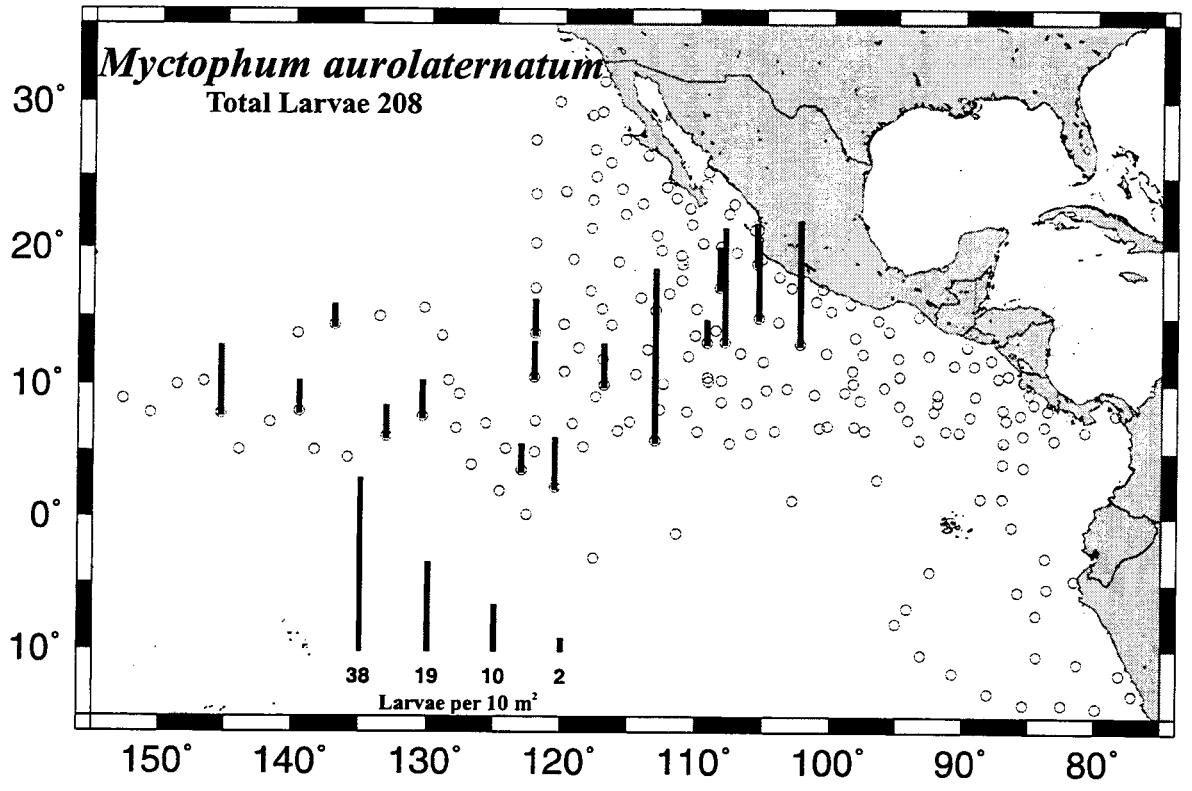

Figure 40. Distribution of *Myctophum aurolaternatum* larvae from bongo net tows: 9910M4.

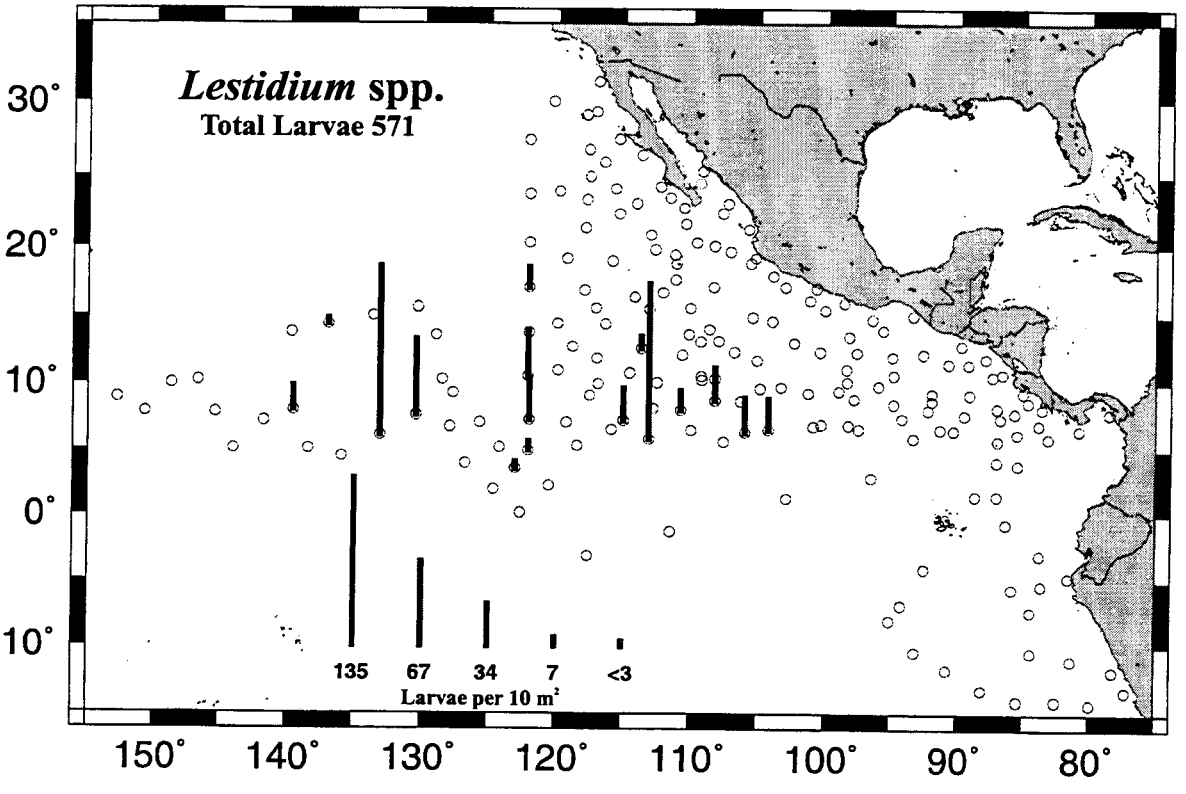

Figure 41. Distribution of *Lestidium* spp. larvae from bongo net tows: 9910M4.

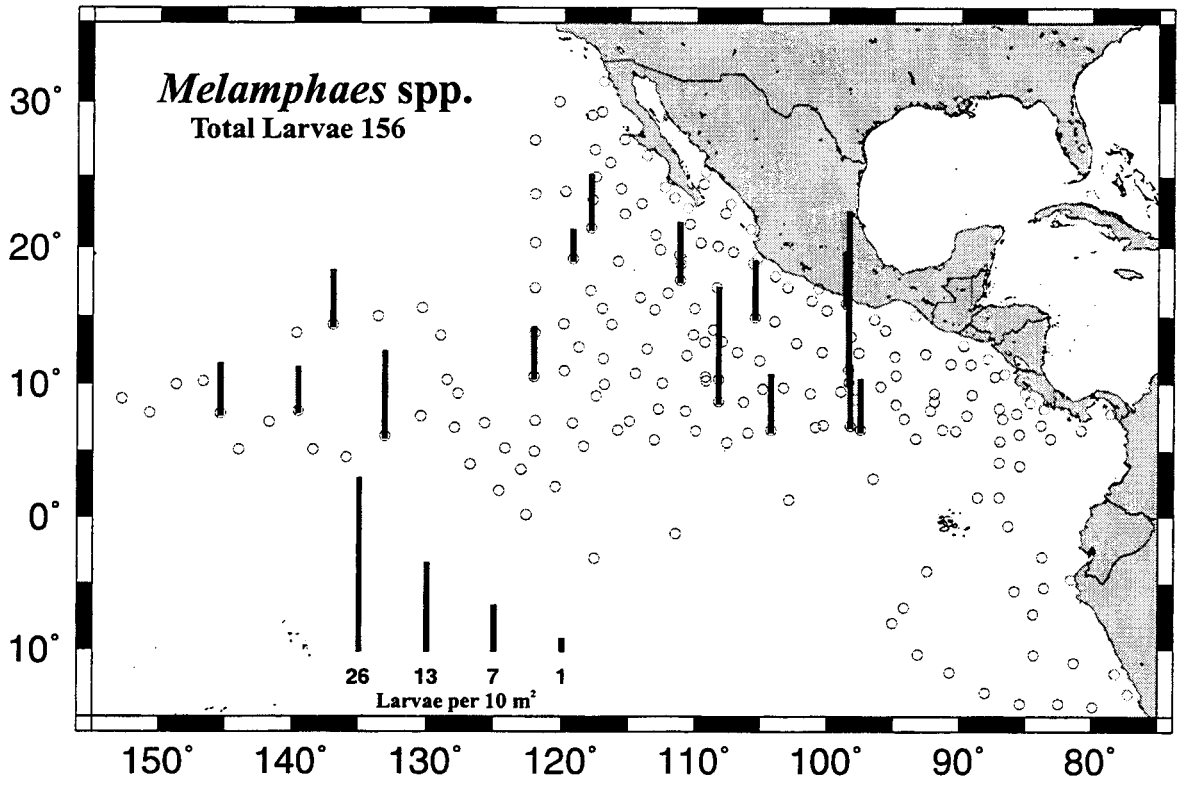

Figure 42. Distribution of *Melamphaes* spp. larvae from bongo net tows: 9910M4.

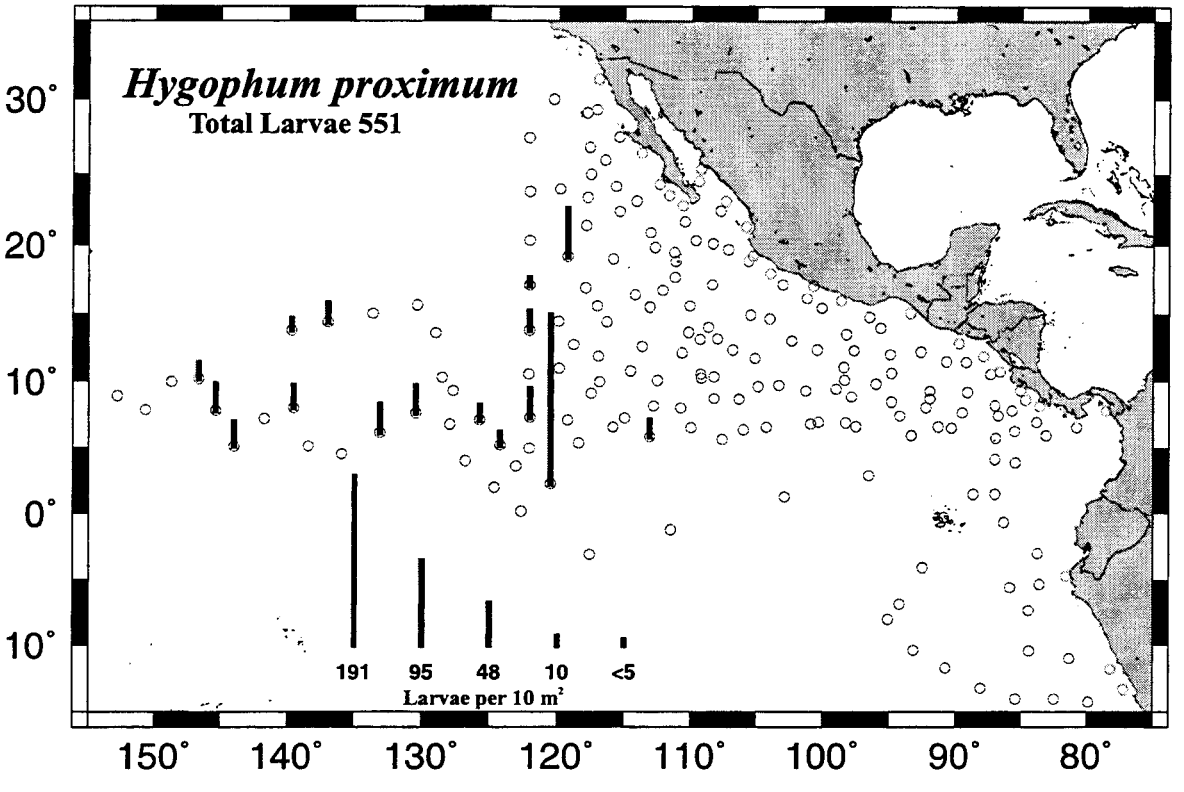

Figure 43. Distribution of *Hygophum proximum* larvae from bongo net tows: 9910M4.

Table 1. Station and Manta net tow data for *Jordan* cruise 9910JD and *McArthur* cruise 9910M4.

Tow Number	CTD Station	Lat. deg.	Lat. min.		Long.(W) deg.	Long.(W) min.	Region	Ship Code	Tow Date yymmdd	Time (Loc.)	Vol.(m^3) Water Strained	Total Larvae	Total Eggs
1	1-003	27	27.8	N	115	25.5	2	JD	990730	2142	143.8	3	2
2	1-005	26	23.6	N	113	45.8	2	JD	990731	2138	80.2	2	2
3	1-006	24	14.4	N	112	23.8	2	JD	990801	2122	86.9	30	49
4	1-008	23	05.2	N	114	06.2	2	JD	990802	2135	81.4	1	544
5	1-010	23	27.3	N	111	39.5	2	JD	990803	2120	89.3	1	798
6	1-012	22	45.8	N	110	37.0	2	JD	990804	2106	92.3	113	67
7	1-014	20	52.1	N	113	03.9	2	JD	990805	2121	89.6	9	12
8	1-016	21	37.1	N	110	30.4	2	JD	990806	2208	72.8	45	16
9	1-018	20	19.0	N	109	40.7	1	JD	990807	2105	77.7	68	148
10	1-020	20	05.3	N	108	22.3	1	JD	990808	2151	97.0	55	267
11	1-022	22	23.8	N	107	46.1	1	JD	990809	2153	88.5	17	4314
12	1-024	24	28.1	N	109	24.3	1	JD	990810	2209	78.3	285	11798
13	1-026	25	18.2	N	109	17.1	1	JD	990811	2221	89.8	501	158
14	1-028	23	02.8	N	107	21.9	1	JD	990812	2209	66.8	30	52
15	1-030	21	14.8	N	105	50.3	1	JD	990813	2152	81.9	25	13
16	1-032	19	41.1	N	107	10.3	1	JD	990814	2152	78.6	51	195
17	1-034	19	12.3	N	105	17.8	1	JD	990815	2251	73.8	4	759
18	2-037	14	02.1	N	108	42.4	4	JD	990822	2137	55.7	3	68
19	2-039	12	07.1	N	110	41.7	5	JD	990823	2135	95.2	30	189
20	2-041	10	03.6	N	112	32.4	5	JD	990824	2149	73.4	37	69
21	2-043	10	47.8	N	114	34.9	5	JD	990825	2107	99.9	25	243
22	2-045	11	53.3	N	116	59.3	5	JD	990826	2108	96.7	35	183
23	2-047	10	57.2	N	119	53.8	5	JD	990827	2119	80.3	14	361
24	2-049	9	06.9	N	117	32.0	5	JD	990828	2108	83.0	57	26
25	2-051	7	03.9	N	119	16.8	5	JD	990829	2108	91.4	4	17
26	2-053	5	19.2	N	118	26.3	5	JD	990830	2106	84.3	5	10
27	2-055	6	32.9	N	115	52.1	5	JD	990831	2106	83.9	14	4
28	2-057	8	08.1	N	112	49.2	5	JD	990901	2050	86.6	11	7
29	2-059	6	28.7	N	109	59.0	4	JD	990902	2035	84.9	4	3
30	2-061	5	36.9	N	107	38.8	4	JD	990903	2019	99.0	0	23
31	2-063	8	40.1	N	106	23.4	4	JD	990904	2021	81.7	9	231
32	2-065	11	45.0	N	105	08.3	4	JD	990905	2119	73.6	42	373
33	2-067	14	38.2	N	104	02.3	4	JD	990906	2119	67.9	14	103
34	2-069	17	07.0	N	103	03.6	1	JD	990907	2107	74.8	22	50
35		17	01.8	N	100	44.7	1	JD	990908	2107	93.3	6	369
36	3-071	15	27.0	N	100	05.6	1	JD	990913	2052	62.2	4	632
37	3-073	12	22.1	N	100	27.3	4	JD	990914	2053	88.8	11	312
38	3-076	6	46.2	N	100	55.7	4	JD	990916	2054	75.5	59	359
39	3-078	6	55.8	N	100	21.8	4	JD	990917	2051	86.4	79	647
40	3-080	9	27.1	N	99	04.1	4	JD	990918	2053	68.9	82	181
41	3-082	12	17.9	N	97	41.3	4	JD	990919	2035	79.3	40	159
42	3-084	14	45.2	N	96	31.6	4	JD	990920	2036	83.2	79	543
43	3-086	13	58.7	N	95	42.1	4	JD	990921	2041	86.6	26	226
44	3-088	10	38.1	N	94	52.3	3	JD	990922	2018	72.8	34	150
45	3-090	7	25.3	N	94	13.5	3	JD	990923	2020	42.8	31	89
46	3-092	5	53.1	N	93	22.7	3	JD	990924	2121	65.7	19	64
47	3-094	8	41.9	N	91	59.2	3	JD	990925	2122	63.7	30	202
48	3-096	11	30.9	N	90	41.9	3	JD	990926	2118	58.9	173	127

Tow Number	CTD Station	Lat. deg.	Lat. min.		Long.(W) deg.	Long.(W) min.	Region	Ship Code	Tow Date yymmdd	Time (Loc.)	Vol.(m^3) Water Strained	Total Larvae	Total Eggs
49	3-098	12	50.7	N	89	43.7	3	JD	990927	2104	61.6	27	1355
50	3-100	11	27.4	N	89	13.1	3	JD	990928	2103	44.7	15	67
51	3-102	10	44.5	N	86	38.0	3	JD	990929	2153	55.1	14	211
52		9	21.4	N	85	05.3	3	JD	990930	2050	76.3	99	444
53	4a-104	8	07.0	N	83	38.4	3	JD	991008	1942	84.5	29	426
54	4a-106	6	13.9	N	85	32.0	3	JD	991009	1940	47.3	15	121
55	4a-108	4	04.7	N	87	00.4	3	JD	991010	2051	47.1	1	39
56	4a-110	1	28.2	N	88	40.6	3	JD	991011	2052	59.1	30	50
57	4a-112	0	18.4	S	90	54.6	8	JD	991012	2107	66.2	2	0
58	4b-113	4	06.8	S	92	28.9	8	JD	991018	2108	64.6	7	170
59	4b-115	6	52.2	S	94	15.7	8	JD	991019	2121	54.0	0	29
60	4b-118	8	02.4	S	95	06.0	8	JD	991020	2121	56.1	2	6
61	4b-120	10	22.8	S	93	10.6	8	JD	991021	2147	65.1	1	7
62	4b-122	11	44.0	S	90	45.5	8	JD	991022	2104	65.0	1	7
63	4b-124	13	13.6	S	88	04.9	8	JD	991023	2102	66.8	2	77
64	4b-126	14	02.3	S	85	25.0	8	JD	991024	2047	68.0	4	282
65	4b-128	14	03.2	S	82	29.8	8	JD	991025	2135	79.7	3	137
66	4b-130	14	17.3	S	79	54.2	8	JD	991026	2133	80.7	12	95
67	4b-132	13	19.5	S	77	13.7	8	JD	991027	2120	87.0	1	15
68	5-133	11	48.1	S	78	12.1	8	JD	991101	2020	60.7	0	61
69	5-135	11	01.1	S	81	20.0	8	JD	991102	2035	70.0	6	85
70	5-137	10	26.2	S	84	24.4	8	JD	991103	2053	57.0	16	57
71	5-139	7	19.7	S	84	26.8	8	JD	991104	2054	87.0	19	170
72	5-141	5	37.2	S	85	51.3	8	JD	991105	2054	75.6	65	20
73	5-143	5	20.7	S	83	38.6	8	JD	991106	2041	70.5	5	12
74	5-145	4	44.4	S	81	35.4	8	JD	991107	2038	95.6	0	3
75	5-147	3	00.0	S	83	46.1	8	JD	991108	2043	78.3	2	320
76	5-149	0	40.3	S	86	20.7	8	JD	991109	2106	95.3	21	70
77	5-151	1	26.9	N	87	01.9	3	JD	991110	2102	48.6	16	4051
78	5-153	3	52.1	N	85	29.4	3	JD	991111	2030	37.5	23	384
79	5-155	5	53.5	N	83	09.9	3	JD	991112	2031	63.1	81	15
80		7	47.7	N	78	32.9	3	JD	991114	1902	61.5	8	2
81	6-159	6	32.8	N	80	47.8	3	JD	991119	2023	73.4	40	48
82	6-161	6	54.9	N	83	51.2	3	JD	991120	2021	53.8	39	19
84	6-165	7	38.6	N	89	29.5	3	JD	991122	2049	56.0	28	230
85	6-167	8	00.5	N	92	16.2	3	JD	991123	2051	79.8	31	1117
86	6-169	8	28.5	N	94	52.1	3	JD	991124	1904	92.7	23	670
87	6-171	8	51.4	N	97	53.6	4	JD	991125	2020	82.6	5	18
88	6-173	9	16.4	N	101	20.5	4	JD	991126	2035	69.4	11	6
89	6-175	9	38.7	N	104	54.1	4	JD	991127	2048	53.6	17	271
90	6-177	10	19.2	N	108	16.8	4	JD	991128	2046	55.1	18	38
91	6-178	10	33.4	N	109	17.9	4	JD	991129	2003	46.8	2	688
92	6-180	13	36.8	N	110	11.9	5	JD	991130	2004	63.6	11	56
93	6-182	16	41.8	N	112	08.2	2	JD	991201	2004	65.3	4	40
94	6-184	18	47.1	N	111	09.5	2	JD	991202	2006	74.7	13	455
95	6-186	19	25.6	N	111	17.2	2	JD	991203	1949	70.3	2	246
96	6-188	19	48.3	N	112	43.7	2	JD	991204	2005	75.2	26	158
97	6-190	24	06.6	N	115	40.7	2	JD	991205	1906	85.1	1	36
98	6-192	25	54.5	N	116	30.8	2	JD	991206	1905	48.5	3	0
99	6-194	29	18.8	N	117	06.6	2	JD	991207	1909	55.6	0	0

Tow Number	CTD Station	Lat. deg.	min.		Long.(W) deg.	min.	Region	Ship Code	Tow Date yymmdd	Time (Loc.)	Vol.(m^3) Water Strained	Total Larvae	Total Eggs
1	1-001	31	18.9	N	116	58.8	2	M4	990728	2208	137.2	7	13
2	1-003	30	00.0	N	120	19.8	2	M4	990729	2218	137.0	3	501
3	1-005	27	25.4	N	122	06.2	2	M4	990730	2212	135.9	11	4
4	1-007	23	45.6	N	122	05.1	2	M4	990731	2211	128.3	6	2
5	1-009	20	19.6	N	122	05.5	2	M4	990801	2159	131.5	4	0
6	1-011	17	04.1	N	122	04.4	2	M4	990802	2155	139.8	0	268
7	1-013	13	47.1	N	122	03.3	5	M4	990803	2149	131.5	5	1083
8	1-015	10	32.7	N	122	06.2	5	M4	990804	2158	159.0	13	330
9		7	14.5	N	122	01.5	5	M4	990805	2155	126.5	3	88
10	1-019	4	55.9	N	122	05.5	5	M4	990806	2133	143.3	0	4
11		3	33.2	N	123	02.1	5	M4	990807	2134	134.3	5	22
12	1-022	5	09.2	N	124	12.9	5	M4	990808	2132	139.2	0	4225
13	1-024	7	03.0	N	125	43.9	6	M4	990809	2124	116.1	0	36
14	1-026	9	15.9	N	127	42.7	6	M4	990810	2047	127.5	0	0
15	1-028	7	36.2	N	130	29.2	6	M4	990811	2112	122.1	0	5
16	1-030	6	05.6	N	133	08.7	6	M4	990812	2123	144.7	1	2
17	1-032	4	28.9	N	135	58.9	6	M4	990813	2128	147.6	2	1
18	1-034	5	03.0	N	138	28.4	6	M4	990814	2124	136.4	1	3
19	1-036	7	59.7	N	139	35.5	6	M4	990815	2059	147.5	0	2
20	1-038	7	10.3	N	141	44.9	7	M4	990816	2056	126.4	0	2
21	1-040	5	04.5	N	144	01.2	7	M4	990817	2056	126.5	6	7
22	1-042	7	48.6	N	145	24.2	7	M4	990818	2053	138.0	1	7
23	1-044	10	11.6	N	146	41.2	7	M4	990819	2127	142.9	2	22
24	1-046	9	57.2	N	148	43.5	7	M4	990820	2134	131.7	0	23
25	1-048	7	49.1	N	150	43.2	7	M4	990821	2131	129.0	1	1
26	1-050	8	53.7	N	152	49.0	7	M4	990822	2042	166.8	3	18
27	2-052	13	47.7	N	139	43.3	6	M4	990905	2046	142.7	3	3
28	2-054	14	24.1	N	137	01.9	6	M4	990906	2039	135.4	1	2
29	2-056	15	00.6	N	133	39.2	6	M4	990907	2115	143.1	0	0
30	2-058	15	36.2	N	130	22.6	6	M4	990908	2114	149.1	4	77
31	2-060	13	35.7	N	129	00.2	6	M4	990909	2051	163.9	4	19
32	2-062	10	17.6	N	128	31.3	6	M4	990910	2052	159.2	1	4
33	2-064	6	43.5	N	127	57.7	6	M4	990911	2120	145.6	13	3
34	2-066	3	57.2	N	126	48.1	6	M4	990912	2057	150.7	9	2062
35	2-068	1	56.1	N	124	39.1	5	M4	990913	2037	149.4	10	13
36	2-070	0	08.3	N	122	38.4	5	M4	990914	2040	162.0	1	3
37	2-072	2	14.8	N	120	32.0	5	M4	990915	2021	175.3	0	52
38	2-074	3	06.1	S	117	37.8	10	M4	990916	2105	165.0	0	842
39	2-078	1	15.0	S	111	30.4	10	M4	990918	2035	160.1	1	2
40	2-084	1	15.6	N	102	54.3	4	M4	990921	2050	184.4	3	7
41	2-086	2	54.3	N	96	35.2	4	M4	990922	2036	159.7	7	73
42	2-093	5	41.4	N	86	58.5	3	M4	990926	2029	157.6	5	31
43	2-095	7	48.5	N	85	42.0	3	M4	990927	1949	170.0	18	4
44	3-096	8	36.0	N	84	40.9	3	M4	991005	1948	178.2	15	25
45	3-098	8	10.9	N	87	01.3	3	M4	991006	1956	148.3	43	246
46	3-100	10	31.8	N	87	22.6	3	M4	991007	1953	166.6	52	4
47	3-102	11	52.4	N	87	54.9	3	M4	991008	1955	167.6	22	287
48	3-104	9	11.5	N	89	07.4	3	M4	991009	1950	139.6	42	118
49	3-106	6	29.4	N	90	20.5	3	M4	991010	2007	148.3	4	14
50	3-108	6	33.9	N	91	19.7	3	M4	991011	2101	146.8	6	402

Tow Number	CTD Station	Lat. deg.	min.		Long.(W) deg.	min.	Region	Ship Code	Tow Date yymmdd	Time (Loc.)	Vol.(m^3) Water Strained	Total Larvae	Total Eggs
51	3-110	9	17.7	N	91	58.6	3	M4	991012	2008	145.4	14	95
52	3-112	12	14.0	N	92	38.7	3	M4	991013	2007	162.4	96	810
53		15	03.5	N	93	25.1	3	M4	991014	2007	165.7	190	306
54	3-115	12	01.1	N	94	59.6	3	M4	991015	2004	169.0	63	12
55	3-117	9	49.2	N	96	03.0	4	M4	991016	2020	140.9	21	194
56	3-119	6	34.5	N	97	32.3	4	M4	991017	2021	142.6	3	21
57	3-121	6	51.9	N	98	20.0	4	M4	991018	2025	135.2	2	71
58	3-123	10	06.5	N	98	25.4	4	M4	991019	2025	149.1	8	276
59	3-125	11	04.5	N	98	26.7	4	M4	991020	2041	143.8	11	830
60	3-127	13	30.4	N	98	17.2	4	M4	991021	2027	130.0	33	0
61	3-129	15	56.4	N	98	39.7	1	M4	991022	2022	160.3	739	424
62	4-130	16	08.3	N	101	12.8	1	M4	991027	2133	74.4	6	170
63	4-132	13	01.3	N	102	23.8	4	M4	991028	2036	149.0	10	334
64	4-134	9	43.7	N	103	21.7	4	M4	991029	2038	131.5	0	63
65	4-136	6	31.9	N	104	18.5	4	M4	991030	2051	143.4	0	119
66	4-138	6	21.6	N	106	02.2	4	M4	991031	2054	97.2	1	14
67	4-140	8	41.2	N	108	15.0	4	M4	991101	2052	136.0	0	2
68	4-142	10	14.5	N	109	12.9	4	M4	991102	2135	124.4	0	56
69	4-144	7	58.1	N	110	48.1	5	M4	991103	2008	157.4	1	4
70	4-146	5	47.8	N	113	07.7	5	M4	991104	2018	98.5	0	8
71	4-148	7	13.9	N	115	00.2	5	M4	991105	2035	128.5	0	3
72	4-150	9	58.0	N	116	53.5	5	M4	991106	2034	123.6	2	5
73	4-152	12	44.5	N	118	50.6	5	M4	991107	2041	122.3	10	89
74	4-154	14	22.9	N	116	20.2	5	M4	991108	2018	128.1	2	18
75	4-156	12	34.2	N	113	41.5	5	M4	991109	2018	131.8	32	124
76	4-158	15	29.3	N	113	07.9	2	M4	991110	2018	125.5	4	494
77	4-160	15	34.6	N	110	06.5	2	M4	991111	2003	123.9	11	8793
78	4-162	13	08.7	N	108	02.4	4	M4	991112	2004	122.9	7	44
79	4-164	13	08.1	N	109	18.3	4	M4	991113	2003	131.3	15	3658
80	4-166	12	20.6	N	106	51.3	4	M4	991114	2003	172.3	18	235
81	4-168	14	55.3	N	105	29.2	4	M4	991115	1938	139.8	27	158
82		17	53.5	N	103	59.4	1	M4	991116	2031	123.4	53	135
83	5-170	18	51.1	N	105	38.1	1	M4	991121	2033	152.8	318	10400
84	5-172	17	07.1	N	108	24.2	1	M4	991122	2003	119.8	34	401
85	5-174	17	36.7	N	111	13.7	2	M4	991123	2005	152.2	2	182
86	5-176	16	21.4	N	114	12.4	2	M4	991124	2026	128.6	13	9846
87	5-178	15	34.9	N	117	03.8	2	M4	991125	2020	142.6	24	375
88	5-180	14	25.1	N	119	57.3	5	M4	991126	2036	136.6	7	78
89	5-182	16	52.0	N	117	57.6	2	M4	991127	2034	141.3	19	6
90	5-184	18	58.6	N	115	51.6	2	M4	991128	2020	136.0	1	8693
91	5-186	19	09.4	N	119	14.8	2	M4	991129	2019	149.9	9	3
92	5-188	21	21.7	N	117	53.2	2	M4	991130	2018	132.0	2	21
93	5-190	22	19.8	N	115	22.4	2	M4	991201	2006	128.1	7	197
94		23	19.0	N	117	49.7	2	M4	991202	1911	146.2	5	2
95	5-193	23	54.6	N	119	52.1	2	M4	991203	2010	137.0	8	6
96	5-195	24	55.9	N	117	33.8	2	M4	991204	2007	157.5	20	19
97	5-197	26	45.9	N	117	38.9	2	M4	991205	2002	156.0	17	23
98	5-199	29	07.1	N	117	50.9	2	M4	991206	1946	152.3	7	21

TABLE 2. Pooled occurrences of fish larvae taken in Manta net tows on *Jordan* cruise 9910JD, and *McArthur* cruise 9910M4.

Rank	Taxon	Occurrences
1	*Vinciguerria lucetia*	98
2	*Oxyporhamphus micropterus*	60
3	*Auxis* spp.	56
4	*Coryphaena equiselis*	53
5	*Prognichthys* spp.	29
6	*Coryphaena hippurus*	25
7	*Cubiceps pauciradiatus*	22
8	*Mugil* spp.	19
8	Gerreidae	19
10	*Cololabis saira*	18
11	*Lampanyctus parvicauda*	15
11	*Opisthonema* spp.	15
13	*Cyclothone* spp.	10
13	*Hirundichthys* spp.	10
13	*Diaphus* spp.	10
16	*Naucrates ductor*	9
16	*Hirundichthys marginatus*	9
16	*Benthosema panamense*	9
16	*Caranx caballus*	9
20	*Polydactylus approximans*	8
20	*Cheilopogon xenopterus*	8
20	Gobiidae	8
23	*Lestidium* spp.	7
23	*Exocoetus* spp.	7
25	*Thunnus* spp.	6
25	*Symphurus* spp.	6
27	*Bothus* spp.	5
27	*Melanocetus* spp.	5
27	*Lampanyctus* spp.	5
30	*Synodus* spp.	4
30	*Chloroscombrus orqueta*	4
30	*Selar crumenophthalmus*	4
30	*Euthynnus lineatus*	4
30	*Canthidermis maculatus*	4
30	*Diplophos proximus*	4
30	*Syacium ovale*	4
30	*Scomberesox saurus*	4
30	*Cetengraulis mysticetus*	4
39	*Citharichthys platophrys*	3
39	*Hemiramphus saltator*	3
39	*Ceratoscopelus warmingii*	3
39	*Trachinotus rhodopus*	3
39	*Coryphaena* spp.	3
39	*Brama dussumieri*	3
39	*Polydactylus opercularis*	3
39	Haemulidae	3
39	Sciaenidae	3
39	*Cheilopogon* spp.	3
39	*Synodus evermanni*	3

TABLE 2. (cont.)

Rank	Taxon	Occurrences
50	*Albula* spp.	2
50	*Ariosoma gilberti*	2
50	*Monolene* spp.	2
50	Eleotridae	2
50	*Pontinus* spp.	2
50	*Psenes pellucidus*	2
50	*Oligoplites* spp.	2
50	*Katsuwonus pelamis*	2
50	*Engraulis ringens*	2
50	*Pronotogrammus multifasciatus*	2
50	*Synodus lucioceps*	2
50	Pomacentridae	2
50	*Sternoptyx* spp.	2
50	*Istiophorus platypterus*	2
50	*Lestidiops neles*	2
50	*Nealotus tripes*	2
50	*Gigantactis* spp.	2
50	*Anchoa* spp.	2
68	*Lepophidium* spp.	1
68	*Zalieutes elater*	1
68	*Oneirodes* spp.	1
68	Bythitidae	1
68	*Bregmaceros bathymaster*	1
68	*Trachipterus altivelis*	1
68	Astronesthinae	1
68	Muraenidae	1
68	*Gymnothorax mordax*	1
68	Clupeidae	1
68	*Sardinops sagax*	1
68	Engraulidae	1
68	*Engraulis mordax*	1
68	*Synodus sechurae*	1
68	*Vinciguerria poweriae*	1
68	*Symbolophorus evermanni*	1
68	*Bathophilus filifer*	1
68	*Synodus scituliceps*	1
68	*Stemonosudis macrura*	1
68	*Ceratoscopelus townsendi*	1
68	*Lampadena urophaos*	1
68	*Stenobrachius leucopsarus*	1
68	*Diogenichthys laternatus*	1
68	*Cyclothone signata*	1
68	*Sphyraena ensis*	1
68	*Howella pammelas*	1
68	*Hypsypops rubicundus*	1
68	*Microspathodon* spp.	1
68	*Chiasmodon niger*	1
68	*Ammodytoides gilli*	1
68	*Paraclinus* spp.	1
68	*Entomacrodus chiostictus*	1
68	*Hypsoblennius gilberti*	1
68	*Ophioblennius steindachneri*	1

TABLE 2. (cont.)

Rank	Taxon	Occurrences
68	*Kyphosus* spp.	1
68	*Chaetodipterus zonatus*	1
68	*Calamus brachysomus*	1
68	*Sarda chiliensis*	1
68	*Scomber japonicus*	1
68	*Cubiceps baxteri*	1
68	*Nomeus gronovii*	1
68	*Psenes sio*	1
68	*Tetragonurus cuvieri*	1
68	*Lactoria diaphana*	1
68	*Ostracion meleagris*	1
68	*Diodon* spp.	1
68	*Synchiropus atrilabiatus*	1
68	Epinephelinae	1
68	*Atherinella* spp.	1
68	*Cheilopogon dorsomaculata*	1
68	*Cheilopogon pinnatibarbatus*	1
68	*Exocoetus monocirrhus*	1
68	*Fodiator acutus*	1
68	*Scopelogadus bispinosus*	1
68	Scorpaenidae	1
68	*Scorpaena* spp.	1
68	*Scorpaenodes xyris*	1
68	*Medialuna californiensis*	1
68	Unidentified fish larvae	1
68	*Centrophryne spinulosa*	1
68	Carangidae	1
68	*Gnathanodon speciosus*	1
68	*Selene peruviana*	1
68	*Seriola* spp.	1
68	*Caristius maderensis*	1
68	Lutjanidae	1
68	*Lutjanus* spp.	1
68	*Lutjanus peru*	1
68	*Xenistius californiensis*	1
68	Serraninae	1
	Total	735

Table 3. Pooled raw counts of fish larvae taken in Manta net tows on *Jordan* cruise 9910JD, and *McArthur* cruise 9910M4.

Rank	Taxon	Count
1	*Opisthonema* spp.	1344
2	*Vinciguerria lucetia*	1105
3	*Auxis* spp.	410
4	*Oxyporhamphus micropterus*	364
5	*Prognichthys* spp.	276
6	*Polydactylus approximans*	233
7	*Cetengraulis mysticetus*	220
8	*Coryphaena equiselis*	139
9	Gerreidae	106
10	*Mugil* spp.	96
11	*Cubiceps pauciradiatus*	86
11	*Cololabis saira*	86
13	*Coryphaena hippurus*	68
14	*Bregmaceros bathymaster*	60
15	Haemulidae	39
16	*Caranx caballus*	33
17	*Benthosema panamense*	31
18	*Hirundichthys* spp.	28
19	*Symphurus* spp.	21
19	*Hirundichthys marginatus*	21
21	*Lampanyctus parvicauda*	20
22	*Cyclothone* spp.	19
23	*Chloroscombrus orqueta*	18
23	Gobiidae	18
25	*Bothus* spp.	17
26	*Polydactylus opercularis*	16
27	*Lestidium* spp.	15
28	*Diaphus* spp.	14
29	*Canthidermis maculatus*	12
30	*Naucrates ductor*	11
30	*Trachinotus rhodopus*	11
30	*Lutjanus peru*	11
30	*Hemiramphus saltator*	11
30	*Lampanyctus* spp.	11
30	*Pontinus* spp.	11
36	*Euthynnus lineatus*	10
37	*Exocoetus* spp.	9
37	*Thunnus* spp.	9
39	*Syacium ovale*	8
39	*Selar crumenophthalmus*	8
39	*Cheilopogon xenopterus*	8
39	Eleotridae	8
43	*Coryphaena* spp.	7
43	*Ceratoscopelus warmingii*	7
43	*Synodus evermanni*	7
46	*Xenistius californiensis*	6
46	*Synodus lucioceps*	6
48	*Scomberesox saurus*	5
48	*Melanocetus* spp.	5

TABLE 3. (cont.)

Rank	Taxon	Count
48	*Albula* spp.	5
48	*Sardinops sagax*	5
48	*Katsuwonus pelamis*	5
53	Carangidae	4
53	*Diplophos proximus*	4
53	*Lutjanus* spp.	4
53	*Sphyraena ensis*	4
53	*Pronotogrammus multifasciatus*	4
53	*Ariosoma gilberti*	4
53	*Synodus* spp.	4
53	Sciaenidae	4
53	*Brama dussumieri*	4
53	*Paraclinus* spp.	4
63	*Vinciguerria poweriae*	3
63	*Citharichthys platophrys*	3
63	*Lestidiops neles*	3
63	Engraulidae	3
63	*Cheilopogon* spp.	3
63	*Hypsypops rubicundus*	3
63	Epinephelinae	3
70	*Synodus scituliceps*	2
70	*Entomacrodus chiostictus*	2
70	*Ammodytoides gilli*	2
70	*Stenobrachius leucopsarus*	2
70	*Cheilopogon pinnatibarbatus*	2
70	*Monolene* spp.	2
70	*Engraulis ringens*	2
70	*Chaetodipterus zonatus*	2
70	*Nealotus tripes*	2
70	*Istiophorus platypterus*	2
70	*Scomber japonicus*	2
70	Clupeidae	2
70	Pomacentridae	2
70	*Gigantactis* spp.	2
70	*Microspathodon* spp.	2
70	*Oneirodes* spp.	2
70	*Psenes pellucidus*	2
70	*Oligoplites* spp.	2
70	*Cyclothone signata*	2
70	*Sternoptyx* spp.	2
70	*Anchoa* spp.	2
91	*Bathophilus filifer*	1
91	*Fodiator acutus*	1
91	*Engraulis mordax*	1
91	*Lepophidium* spp.	1
91	*Centrophryne spinulosa*	1
91	*Zalieutes elater*	1
91	*Cheilopogon dorsomaculata*	1
91	*Atherinella* spp.	1
91	*Exocoetus monocirrhus*	1
91	Astronesthinae	1

TABLE 3. (cont.)

Rank	Taxon	Count
91	*Nomeus gronovii*	1
91	Unidentified fish larvae	1
91	*Gnathanodon speciosus*	1
91	*Selene peruviana*	1
91	*Scorpaena* spp.	1
91	*Scorpaenodes xyris*	1
91	Scorpaenidae	1
91	*Synchiropus atrilabiatus*	1
91	*Seriola* spp.	1
91	Serraninae	1
91	*Psenes sio*	1
91	*Cubiceps baxteri*	1
91	*Kyphosus* spp.	1
91	*Tetragonurus cuvieri*	1
91	*Caristius maderensis*	1
91	*Sarda chiliensis*	1
91	*Calamus brachysomus*	1
91	*Medialuna californiensis*	1
91	*Gymnothorax mordax*	1
91	*Ophioblennius steindachneri*	1
91	*Ceratoscopelus townsendi*	1
91	Bythitidae	1
91	*Diogenichthys laternatus*	1
91	*Lampadena urophaos*	1
91	*Hypsoblennius gilberti*	1
91	*Symbolophorus evermanni*	1
91	Lutjanidae	1
91	Muraenidae	1
91	*Howella pammelas*	1
91	*Trachipterus altivelis*	1
91	*Lactoria diaphana*	1
91	*Scopelogadus bispinosus*	1
91	*Ostracion meleagris*	1
91	*Chiasmodon niger*	1
91	*Diodon* spp.	1
91	*Synodus sechurae*	1
91	*Stemonosudis macrura*	1
	Total	5249

Table 4. Numbers (raw counts) of fish larvae taken in Manta net tows on *Jordan* cruise 9910JD and *McArthur* cruise 9910M4 listed by taxon, tow number, and region.

Albula spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	4	5.11
13	JD	026	1	1	1.11

Muraenidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
43	M4	095	3	1	0.59

Gymnothorax mordax

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	1	1.28

Ariosoma gilberti

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
42	JD	084	4	3	3.61
49	JD	098	3	1	1.62

Clupeidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
35	JD		1	2	2.14

Opisthonema spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	2	2.30
8	JD	016	2	1	1.37
12	JD	024	1	127	162.20
13	JD	026	1	358	398.66
14	JD	028	1	1	1.50
15	JD	030	1	5	6.11
42	JD	084	4	28	33.65
44	M4	096	3	1	0.56
48	JD	096	3	8	13.58
49	JD	098	3	14	22.73
50	JD	100	3	7	15.66
52	M4	112	3	1	0.62
53	M4		3	146	88.11
54	M4	115	3	9	5.33
61	M4	129	1	636	396.76

Sardinops sagax

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
96	M4	195	2	5	3.17

Engraulidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
44	M4	096	3	3	1.68

Anchoa spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
76	JD	149	8	1	1.05
80	JD		3	1	1.63

Cetengraulis mysticetus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	116	148.15
13	JD	026	1	11	12.25
48	JD	096	3	5	8.49
52	JD		3	88	115.33

Engraulis mordax

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	1	1.08

Engraulis ringens

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
69	JD	135	8	1	1.43
73	JD	143	8	1	1.42

Cyclothone spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
23	JD	047	5	1	1.25
24	JD	049	5	1	1.20
56	JD	110	3	1	1.69
58	JD	113	8	1	1.55
64	JD	126	8	1	1.47
66	JD	130	8	7	8.67
77	JD	151	3	2	4.12
79	JD	155	3	1	1.58
95	M4	193	2	1	0.73
96	JD	188	2	3	3.99

Cyclothone signata

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
96	JD	188	2	2	2.66

Diplophos proximus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	1	1.28
23	JD	047	5	1	1.25
37	JD	073	4	1	1.13
38	JD	076	4	1	1.32

Sternoptyx spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
34	M4	066	6	1	0.66
75	JD	147	8	1	1.28

Vinciguerria lucetia

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	6	6.90
6	JD	012	2	10	10.83
7	M4	013	5	5	3.80
8	JD	016	2	27	37.09
8	M4	015	5	3	1.89
9	JD	018	1	4	5.15
9	M4		5	3	2.37
11	M4		5	5	3.72
12	JD	024	1	1	1.28
14	JD	028	1	12	17.96
17	M4	032	6	1	0.68
18	JD	037	4	1	1.80
19	JD	039	5	6	6.30
21	M4	040	7	6	4.74
21	JD	043	5	8	8.01
22	JD	045	5	13	13.44
23	JD	047	5	11	13.70
24	JD	049	5	45	54.22
25	JD	051	5	1	1.09
26	JD	053	5	1	1.19
27	M4	052	6	2	1.40
27	JD	055	5	8	9.54
28	JD	057	5	5	5.77
29	JD	059	4	3	3.53
31	M4	060	6	2	1.22
31	JD	063	4	7	8.57
32	JD	065	4	41	55.71
33	M4	064	6	8	5.49
33	JD	067	4	9	13.25
34	M4	066	6	8	5.31
34	JD	069	1	18	24.06
35	M4	068	5	7	4.69
36	JD	071	1	1	1.61
36	M4	070	5	1	0.62
37	JD	073	4	5	5.63
38	JD	076	4	47	62.25
39	JD	078	4	69	79.86
40	JD	080	4	60	87.08
41	JD	082	4	34	42.88
41	M4	086	4	5	3.13
42	JD	084	4	6	7.21
42	M4	093	3	1	0.63
44	JD	088	3	23	31.59

Vinciguerria lucetia (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
45	M4	098	3	1	0.67
45	JD	090	3	28	65.42
46	JD	092	3	17	25.88
47	JD	094	3	26	40.82
47	M4	102	3	3	1.79
48	JD	096	3	50	84.89
48	M4	104	3	10	7.16
49	JD	098	3	4	6.49
49	M4	106	3	1	0.67
50	JD	100	3	5	11.19
50	M4	108	3	1	0.68
51	JD	102	3	1	1.81
51	M4	110	3	1	0.69
52	M4	112	3	2	1.23
54	M4	115	3	3	1.78
54	JD	106	3	9	19.03
55	JD	108	3	1	2.12
56	JD	110	3	23	38.92
57	JD	112	8	2	3.02
58	JD	113	8	6	9.29
60	JD	118	8	2	3.57
61	M4	129	1	1	0.62
66	M4	138	4	1	1.03
69	JD	135	8	5	7.14
70	JD	137	8	13	22.81
71	JD	139	8	19	21.84
72	JD	141	8	65	85.98
72	M4	150	5	1	0.81
73	JD	143	8	4	5.67
73	M4	152	5	1	0.82
76	JD	149	8	15	15.74
77	JD	151	3	5	10.29
78	JD	153	3	22	58.67
79	JD	155	3	79	125.20
82	JD	161	3	1	1.86
84	JD	165	3	4	7.14
84	M4	172	1	3	2.50
86	M4	176	2	4	3.11
86	JD	169	3	1	1.08
87	M4	178	2	23	16.13
88	M4	180	5	6	4.39
88	JD	173	4	4	5.76
89	M4	182	2	19	13.45
89	JD	175	4	15	27.99
90	M4	184	2	1	0.74
90	JD	177	4	14	25.41
91	JD	178	4	2	4.27
92	M4	188	2	1	0.76

Vinciguerria lucetia (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
92	JD	180	5	3	4.72
93	M4	190	2	6	4.68
93	JD	182	2	4	6.13
94	JD	184	2	4	5.35
95	M4	193	2	6	4.38
96	JD	188	2	16	21.28
98	JD	192	2	2	4.12

Vinciguerria poweriae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	M4	005	2	3	2.21

Astronesthinae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
77	JD	151	3	1	2.06

Bathophilus filifer

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
38	JD	076	4	1	1.32

Synodus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
11	JD	022	1	1	1.13
12	JD	024	1	1	1.28
15	JD	030	1	1	1.22
54	M4	115	3	1	0.59

Synodus evermanni

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
43	M4	095	3	5	2.94
49	JD	098	3	1	1.62
51	JD	102	3	1	1.81

Synodus lucioceps

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	5	6.39
13	JD	026	1	1	1.11

Synodus scituliceps

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
76	JD	149	8	2	2.10

Synodus sechurae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
76	JD	149	8	1	1.05

Lestidiops neles

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	1	1.08
48	JD	096	3	2	3.40

Lestidium spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
25	JD	051	5	3	3.28
27	JD	055	5	3	3.58
28	JD	057	5	2	2.31
33	M4	064	6	4	2.75
35	M4	068	5	1	0.67
38	JD	076	4	1	1.32
46	JD	092	3	1	1.52

Stemonosudis macrura

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
56	JD	110	3	1	1.69

Ceratoscopelus townsendi

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
4	M4	007	2	1	0.78

Ceratoscopelus warmingii

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
64	JD	126	8	1	1.47
65	JD	128	8	2	2.51
66	JD	130	8	4	4.96

Diaphus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
26	JD	053	5	2	2.37
27	JD	055	5	1	1.19
28	JD	057	5	1	1.15
35	JD		1	2	2.14
35	M4	068	5	1	0.67
38	JD	076	4	1	1.32
40	JD	080	4	2	2.90
46	JD	092	3	1	1.52
90	JD	177	4	1	1.81
96	JD	188	2	2	2.66

Lampadena urophaos

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
35	M4	068	5	1	0.67

Lampanyctus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
48	M4	104	3	1	0.72
56	JD	110	3	5	8.46

Lampanyctus spp. (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
76	JD	149	8	1	1.05
77	JD	151	3	3	6.17
78	JD	153	3	1	2.67

Lampanyctus parvicauda

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
24	JD	049	5	2	2.41
27	JD	055	5	1	1.19
31	JD	063	4	1	1.22
38	JD	076	4	3	3.97
39	JD	078	4	1	1.16
40	JD	080	4	1	1.45
41	M4	086	4	1	0.63
44	JD	088	3	1	1.37
47	JD	094	3	1	1.57
49	M4	106	3	1	0.67
50	JD	100	3	1	2.24
54	JD	106	3	2	4.23
70	JD	137	8	2	3.51
77	JD	151	3	1	2.06
79	JD	155	3	1	1.58

Stenobrachius leucopsarus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	M4	005	2	2	1.47

Benthosema panamense

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	1	1.15
6	JD	012	2	8	8.67
7	JD	014	2	1	1.12
8	JD	016	2	1	1.37
12	JD	024	1	2	2.55
48	JD	096	3	13	22.07
49	JD	098	3	3	4.87
52	JD		3	1	1.31
53	JD	104	3	1	1.18

Diogenichthys laternatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
86	JD	169	3	1	1.08

Symbolophorus evermanni

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
31	JD	063	4	1	1.22

Trachipterus altivelis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
16	M4	030	6	1	0.69

Bregmaceros bathymaster

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
48	JD	096	3	60	101.87

Lepophidium spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
52	JD		3	1	1.31

Bythitidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
29	JD	059	4	1	1.18

Zalieutes elater

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
51	JD	102	3	1	1.81

Melanocetus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
24	JD	049	5	1	1.20
32	JD	065	4	1	1.36
38	JD	076	4	1	1.32
49	M4	106	3	1	0.67
77	M4	160	2	1	0.81

Oneirodes spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
63	JD	124	8	2	2.99

Centrophryne spinulosa

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
32	M4	062	6	1	0.63

Gigantactis spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
52	JD		3	1	1.31
77	JD	151	3	1	2.06

Atherinella spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
67	JD	132	8	1	1.15

Cololabis saira

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
1	JD	003	2	1	0.70
1	M4	001	2	6	4.37

Cololabis saira (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
2	M4	003	2	3	2.19
3	M4	005	2	6	4.42
3	JD	006	2	2	2.30
4	JD	008	2	1	1.23
4	M4	007	2	5	3.90
5	M4	009	2	4	3.04
91	M4	186	2	9	6.00
92	M4	188	2	1	0.76
93	M4	190	2	1	0.78
94	M4		2	5	3.42
95	M4	193	2	1	0.73
96	JD	188	2	1	1.33
96	M4	195	2	15	9.52
97	JD	190	2	1	1.18
97	M4	197	2	17	10.90
98	M4	199	2	7	4.60

Scomberesox saurus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
64	JD	126	8	2	2.94
65	JD	128	8	1	1.25
66	JD	130	8	1	1.24
70	JD	137	8	1	1.75

Hemiramphus saltator

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
44	M4	096	3	9	5.05
45	M4	098	3	1	0.67
80	JD		3	1	1.63

Cheilopogon spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
26	M4	050	7	1	0.60
28	M4	054	6	1	0.74
85	M4	174	2	1	0.66

Cheilopogon dorsomaculata

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
20	JD	041	5	1	1.36

Cheilopogon pinnatibarbatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	2	2.30

Cheilopogon xenopterus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
7	JD	014	2	1	1.12
22	M4	042	7	1	0.72

Cheilopogon xenopterus (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
31	M4	060	6	1	0.61
37	JD	073	4	1	1.13
41	JD	082	4	1	1.26
47	JD	094	3	1	1.57
53	JD	104	3	1	1.18
57	M4	121	4	1	0.74

Exocoetus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
48	M4	104	3	1	0.72
59	M4	125	4	1	0.70
73	M4	152	5	1	0.82
75	M4	156	5	1	0.76
77	M4	160	2	1	0.81
84	M4	172	1	1	0.83
86	M4	176	2	3	2.33

Exocoetus monocirrhus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
74	M4	154	5	1	0.78

Fodiator acutus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
35	JD		1	1	1.07

Hirundichthys spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
8	M4	015	5	4	2.52
19	JD	039	5	2	2.10
45	M4	098	3	3	2.02
46	M4	100	3	1	0.60
47	M4	102	3	1	0.60
52	M4	112	3	6	3.69
77	M4	160	2	1	0.81
84	M4	172	1	8	6.68
85	M4	174	2	1	0.66
85	JD	167	3	1	1.25

Hirundichthys marginatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
18	M4	034	6	1	0.73
43	M4	095	3	2	1.18
45	M4	098	3	3	2.02
75	M4	156	5	8	6.07
76	M4	158	2	1	0.80
80	M4	166	4	2	1.16
86	JD	169	3	1	1.08
87	M4	178	2	1	0.70

Hirundichthys marginatus (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
88	JD	173	4	2	2.88

Oxyporhamphus micropterus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	6	6.50
7	JD	014	2	2	2.23
8	JD	016	2	6	8.24
8	M4	015	5	1	0.63
9	JD	018	1	21	27.03
10	JD	020	1	25	25.77
11	JD	022	1	5	5.65
14	JD	028	1	3	4.49
16	JD	032	1	22	27.99
18	JD	037	4	2	3.59
19	JD	039	5	3	3.15
20	JD	041	5	10	13.62
21	JD	043	5	5	5.01
22	JD	045	5	6	6.20
28	JD	057	5	1	1.15
30	M4	058	6	1	0.67
33	JD	067	4	3	4.42
33	M4	064	6	1	0.69
34	JD	069	1	3	4.01
37	JD	073	4	3	3.38
38	JD	076	4	1	1.32
39	JD	078	4	5	5.79
40	JD	080	4	5	7.26
41	JD	082	4	1	1.26
42	M4	093	3	3	1.90
42	JD	084	4	1	1.20
44	JD	088	3	6	8.24
45	M4	098	3	9	6.07
45	JD	090	3	3	7.01
47	M4	102	3	2	1.19
48	M4	104	3	16	11.46
49	M4	106	3	1	0.67
51	M4	110	3	9	6.19
52	M4	112	3	19	11.70
53	JD	104	3	1	1.18
54	JD	106	3	1	2.11
54	M4	115	3	3	1.78
55	M4	117	4	16	11.36
58	M4	123	4	1	0.67
59	M4	125	4	4	2.78
60	M4	127	4	1	0.77
73	M4	152	5	2	1.64
75	M4	156	5	7	5.31
77	M4	160	2	5	4.04

Oxyporhamphus micropterus (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
78	M4	162	4	1	0.81
79	M4	164	4	11	8.38
80	M4	166	4	3	1.74
81	M4	168	4	3	2.15
81	JD	159	3	1	1.36
82	JD	161	3	36	66.91
84	M4	172	1	12	10.02
84	JD	165	3	15	26.79
85	JD	167	3	16	20.05
86	M4	176	2	3	2.33
86	JD	169	3	4	4.31
87	JD	171	4	1	1.21
88	JD	173	4	2	2.88
89	JD	175	4	1	1.87
90	JD	177	4	3	5.44
92	JD	180	5	1	1.57

Prognichthys spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	1	1.08
9	JD	018	1	16	20.59
10	JD	020	1	1	1.03
11	JD	022	1	4	4.52
12	JD	024	1	6	7.66
13	JD	026	1	26	28.95
14	JD	028	1	8	11.98
16	JD	032	1	1	1.27
35	JD		1	1	1.07
43	JD	086	4	3	3.46
43	M4	095	3	9	5.29
44	M4	096	3	1	0.56
45	M4	098	3	19	12.81
46	M4	100	3	27	16.21
47	M4	102	3	3	1.79
48	M4	104	3	4	2.87
52	M4	112	3	31	19.09
53	M4		3	29	17.50
53	JD	104	3	22	26.04
54	M4	115	3	9	5.33
60	M4	127	4	12	9.23
61	M4	129	1	14	8.73
62	M4	130	1	2	2.69
80	M4	166	4	1	0.58
81	M4	168	4	4	2.86
81	JD	159	3	3	4.09
82	M4		1	12	9.72
83	M4	170	1	5	3.27
84	M4	172	1	2	1.67

Scopelogadus bispinosus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
61	JD	120	8	1	1.54

Scorpaenidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	1	1.08

Pontinus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
48	JD	096	3	10	16.98
75	JD	147	8	1	1.28

Scorpaena spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	1	1.28

Scorpaenodes xyris

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
51	JD	102	3	1	1.81

Howella pammelas

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
38	JD	076	4	1	1.32

Serraninae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
2	JD	005	2	1	1.25

Pronotogrammus multifasciatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	3	3.25
76	JD	149	8	1	1.05

Epinephelinae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	3	3.25

Carangidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
24	JD	049	5	4	4.82

Caranx caballus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	1	1.28
13	JD	026	1	11	12.25
42	M4	093	3	1	0.63
43	JD	086	4	6	6.93
53	M4		3	3	1.81

Caranx caballus (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
61	M4	129	1	5	3.12
81	JD	159	3	1	1.36
83	M4	170	1	4	2.62
94	JD	184	2	1	1.34

Chloroscombrus orqueta

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
53	M4		3	1	0.60
54	M4	115	3	4	2.37
61	M4	129	1	12	7.49
83	M4	170	1	1	0.65

Gnathanodon speciosus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
83	M4	170	1	1	0.65

Naucrates ductor

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
8	JD	016	2	1	1.37
23	M4	044	7	1	0.70
30	M4	058	6	1	0.67
39	M4	078	10	1	0.62
40	M4	084	4	2	1.08
55	M4	117	4	1	0.71
81	JD	159	3	2	2.72
84	M4	172	1	1	0.83
86	JD	169	3	1	1.08

Oligoplites spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
13	JD	026	1	1	1.11
61	M4	129	1	1	0.62

Selar crumenophthalmus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	2	2.17
12	JD	024	1	1	1.28
19	JD	039	5	3	3.15
42	JD	084	4	2	2.40

Selene peruviana

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	1	1.08

Seriola spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
77	JD	151	3	1	2.06

Trachinotus rhodopus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
51	JD	102	3	1	1.81
61	M4	129	1	8	4.99
83	M4	170	1	2	1.31

Coryphaena spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
19	JD	039	5	2	2.10
63	M4	132	4	4	2.68
77	JD	151	3	1	2.06

Coryphaena equiselis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
7	JD	014	2	1	1.12
8	M4	015	5	4	2.52
10	JD	020	1	3	3.09
17	M4	032	6	1	0.68
19	JD	039	5	1	1.05
21	JD	043	5	2	2.00
23	M4	044	7	1	0.70
25	M4	048	7	1	0.78
26	M4	050	7	1	0.60
27	M4	052	6	1	0.70
30	M4	058	6	2	1.34
33	JD	067	4	2	2.95
41	M4	086	4	1	0.63
41	JD	082	4	1	1.26
43	JD	086	4	1	1.15
47	M4	102	3	1	0.60
48	M4	104	3	3	2.15
50	M4	108	3	3	2.04
51	M4	110	3	1	0.69
52	M4	112	3	1	0.62
54	M4	115	3	4	2.37
54	JD	106	3	2	4.23
55	M4	117	4	1	0.71
56	M4	119	4	3	2.10
57	M4	121	4	1	0.74
58	M4	123	4	1	0.67
59	M4	125	4	1	0.70
60	M4	127	4	2	1.54
62	M4	130	1	1	1.34
63	M4	132	4	4	2.68
72	M4	150	5	1	0.81
73	M4	152	5	6	4.91
74	M4	154	5	1	0.78
75	M4	156	5	12	9.10
76	M4	158	2	2	1.59
77	M4	160	2	3	2.42

Coryphaena equiselis (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
78	M4	162	4	2	1.63
79	M4	164	4	2	1.52
80	M4	166	4	10	5.80
81	M4	168	4	2	1.43
82	JD	161	3	1	1.86
82	M4		1	14	11.35
83	M4	170	1	2	1.31
84	JD	165	3	1	1.79
84	M4	172	1	4	3.34
85	JD	167	3	6	7.52
86	M4	176	2	3	2.33
86	JD	169	3	8	8.63
87	JD	171	4	1	1.21
88	JD	173	4	3	4.32
88	M4	180	5	1	0.73
94	JD	184	2	1	1.34
95	JD	186	2	1	1.42

Coryphaena hippurus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
5	JD	010	2	1	1.12
6	JD	012	2	4	4.33
9	JD	018	1	3	3.86
11	JD	022	1	1	1.13
42	JD	084	4	1	1.20
43	M4	095	3	1	0.59
43	JD	086	4	8	9.24
44	M4	096	3	1	0.56
44	JD	088	3	1	1.37
45	M4	098	3	1	0.67
46	M4	100	3	2	1.20
47	M4	102	3	5	2.98
48	M4	104	3	1	0.72
49	JD	098	3	1	1.62
51	M4	110	3	1	0.69
52	M4	112	3	4	2.46
53	JD	104	3	2	2.37
54	M4	115	3	8	4.73
60	M4	127	4	4	3.08
61	M4	129	1	2	1.25
78	M4	162	4	1	0.81
80	JD		3	1	1.63
81	JD	159	3	9	12.26
82	JD	161	3	1	1.86
83	M4	170	1	4	2.62

Brama dussumieri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
27	JD	055	5	1	1.19
28	JD	057	5	2	2.31
62	JD	122	8	1	1.54

Caristius maderensis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
40	M4	084	4	1	0.54

Lutjanidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
13	JD	026	1	1	1.11

Lutjanus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
15	JD	030	1	4	4.88

Lutjanus peru

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	11	11.92

Gerreidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	1	1.15
12	JD	024	1	8	10.22
13	JD	026	1	32	35.63
14	JD	028	1	1	1.50
15	JD	030	1	1	1.22
45	M4	098	3	3	2.02
46	M4	100	3	7	4.20
47	M4	102	3	2	1.19
48	M4	104	3	5	3.58
48	JD	096	3	2	3.40
49	JD	098	3	2	3.25
51	M4	110	3	1	0.69
52	JD		3	1	1.31
52	M4	112	3	9	5.54
53	M4		3	3	1.81
54	M4	115	3	12	7.10
60	M4	127	4	1	0.77
61	M4	129	1	2	1.25
83	M4	170	1	13	8.51

Haemulidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	1	1.15
6	JD	012	2	1	1.08
13	JD	026	1	37	41.20

Xenistius californiensis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	6	6.90

Calamus brachysomus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	1	1.15

Sciaenidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	1	1.28
13	JD	026	1	2	2.23
61	M4	129	1	1	0.62

Polydactylus approximans

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
15	JD	030	1	2	2.44
50	JD	100	3	2	4.47
51	JD	102	3	1	1.81
52	JD		3	1	1.31
53	M4		3	2	1.21
54	M4	115	3	7	4.14
61	M4	129	1	5	3.12
83	M4	170	1	213	139.40

Polydactylus opercularis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
53	M4		3	1	0.60
54	M4	115	3	1	0.59
83	M4	170	1	14	9.16

Kyphosus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
53	JD	104	3	1	1.18

Medialuna californiensis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
1	M4	001	2	1	0.73

Mugil spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	1	1.15
6	JD	012	2	5	5.42
13	JD	026	1	2	2.23
15	JD	030	1	1	1.22
36	JD	071	1	1	1.61
41	JD	082	4	1	1.26
42	JD	084	4	1	1.20
45	M4	098	3	1	0.67

Mugil spp. (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
46	M4	100	3	1	0.60
48	M4	104	3	1	0.72
48	JD	096	3	1	1.70
51	JD	102	3	2	3.63
52	M4	112	3	1	0.62
53	M4		3	2	1.21
53	JD	104	3	1	1.18
60	M4	127	4	1	0.77
61	M4	129	1	43	26.82
80	JD		3	1	1.63
83	M4	170	1	29	18.98

Pomacentridae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	1	1.08
42	JD	084	4	1	1.20

Hypsypops rubicundus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	3	3.45

Microspathodon spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
83	M4	170	1	2	1.31

Chiasmodon niger

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
96	JD	188	2	1	1.33

Ammodytoides gilli

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	2	2.17

Paraclinus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
3	JD	006	2	4	4.60

Entomacrodus chiostictus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
42	JD	084	4	2	2.40

Hypsoblennius gilberti

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
2	JD	005	2	1	1.25

Ophioblennius steindachneri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	1	1.08

Synchiropus atrilabiatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
52	JD		3	1	1.31

Eleotridae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
47	M4	102	3	1	0.60
48	JD	096	3	7	11.88

Gobiidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	2	2.17
12	JD	024	1	1	1.28
45	M4	098	3	2	1.35
47	JD	094	3	1	1.57
48	JD	096	3	2	3.40
51	JD	102	3	3	5.44
52	JD		3	4	5.24
80	JD		3	3	4.88

Chaetodipterus zonatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
13	JD	026	1	2	2.23

Sphyraena ensis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
13	JD	026	1	4	4.45

Nealotus tripes

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
38	JD	076	4	1	1.32
77	JD	151	3	1	2.06

Istiophorus platypterus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
60	M4	127	4	1	0.77
82	M4		1	1	0.81

Auxis spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	42	45.50
7	JD	014	2	3	3.35
8	JD	016	2	7	9.62
9	JD	018	1	23	29.60
10	JD	020	1	24	24.74

Auxis spp. (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
11	JD	022	1	5	5.65
12	JD	024	1	3	3.83
13	JD	026	1	6	6.68
14	JD	028	1	5	7.49
16	JD	032	1	28	35.62
17	JD	034	1	4	5.42
19	JD	039	5	3	3.15
20	JD	041	5	7	9.54
21	JD	043	5	5	5.01
22	JD	045	5	3	3.10
23	JD	047	5	1	1.25
26	JD	053	5	2	2.37
34	JD	069	1	1	1.34
38	JD	076	4	1	1.32
39	JD	078	4	1	1.16
40	JD	080	4	9	13.06
41	JD	082	4	2	2.52
42	JD	084	4	24	28.85
43	JD	086	4	7	8.08
44	JD	088	3	1	1.37
46	M4	100	3	14	8.40
47	JD	094	3	1	1.57
47	M4	102	3	2	1.19
48	JD	096	3	1	1.70
51	M4	110	3	1	0.69
52	M4	112	3	21	12.93
53	M4		3	3	1.81
54	M4	115	3	2	1.18
55	M4	117	4	3	2.13
59	M4	125	4	5	3.48
60	M4	127	4	8	6.15
61	M4	129	1	8	4.99
62	M4	130	1	3	4.03
63	M4	132	4	2	1.34
75	M4	156	5	4	3.03
76	M4	158	2	1	0.80
78	M4	162	4	3	2.44
79	M4	164	4	2	1.52
80	M4	166	4	2	1.16
81	JD	159	3	17	23.16
81	M4	168	4	18	12.88
82	M4		1	18	14.59
83	M4	170	1	26	17.02
84	JD	165	3	4	7.14
84	M4	172	1	3	2.50
85	JD	167	3	4	5.01
86	JD	169	3	6	6.47
87	JD	171	4	3	3.63
89	JD	175	4	1	1.87

Auxis spp. (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
92	JD	180	5	2	3.14
94	JD	184	2	5	6.69

Euthynnus lineatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
15	JD	030	1	6	7.33
42	JD	084	4	1	1.20
61	M4	129	1	1	0.62
83	M4	170	1	2	1.31

Katsuwonus pelamis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
24	JD	049	5	4	4.82
26	M4	050	7	1	0.60

Sarda chiliensis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	1	1.28

Scomber japonicus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
1	JD	003	2	2	1.39

Thunnus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
21	JD	043	5	2	2.00
22	JD	045	5	3	3.10
31	M4	060	6	1	0.61
37	JD	073	4	1	1.13
40	JD	080	4	1	1.45
94	JD	184	2	1	1.34

Cubiceps baxteri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
96	JD	188	2	1	1.33

Cubiceps pauciradiatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
7	JD	014	2	1	1.12
8	JD	016	2	2	2.75
9	JD	018	1	1	1.29
10	JD	020	1	2	2.06
11	JD	022	1	1	1.13
19	JD	039	5	10	10.50
20	JD	041	5	19	25.89
21	JD	043	5	3	3.00
22	JD	045	5	10	10.34
39	JD	078	4	2	2.31

Cubiceps pauciradiatus (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
40	JD	080	4	3	4.35
44	JD	088	3	1	1.37
48	JD	096	3	1	1.70
51	JD	102	3	1	1.81
58	M4	123	4	6	4.02
81	JD	159	3	7	9.54
84	JD	165	3	4	7.14
85	JD	167	3	4	5.01
86	JD	169	3	1	1.08
92	JD	180	5	5	7.86
94	JD	184	2	1	1.34
95	JD	186	2	1	1.42

Nomeus gronovii

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
39	JD	078	4	1	1.16

Psenes pellucidus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
52	M4	112	3	1	0.62
60	M4	127	4	1	0.77

Psenes sio

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
47	M4	102	3	1	0.60

Tetragonurus cuvieri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
98	JD	192	2	1	2.06

Citharichthys platophrys

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
42	JD	084	4	1	1.20
48	JD	096	3	1	1.70
52	JD		3	1	1.31

Syacium ovale

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
12	JD	024	1	1	1.28
15	JD	030	1	5	6.11
48	JD	096	3	1	1.70
51	JD	102	3	1	1.81

Bothus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	5	5.42
36	JD	071	1	1	1.61
42	JD	084	4	8	9.62
47	M4	102	3	1	0.60
50	M4	108	3	2	1.36

Monolene spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	1	1.08
51	JD	102	3	1	1.81

Symphurus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
6	JD	012	2	1	1.08
12	JD	024	1	3	3.83
13	JD	026	1	6	6.68
44	JD	088	3	1	1.37
48	JD	096	3	9	15.28
49	JD	098	3	1	1.62

Canthidermis maculatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
43	JD	086	4	1	1.15
60	M4	127	4	2	1.54
80	JD		3	1	1.63
82	M4		1	8	6.48

Lactoria diaphana

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
8	M4	015	5	1	0.63

Ostracion meleagris

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
54	JD	106	3	1	2.11

Diodon spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
36	JD	071	1	1	1.61

Unidentified fish larvae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 100m³
69	M4	144	5	1	0.64

Table 5. Average numbers of larvae (per 100 m³ of water filtered) for each taxon taken in Manta net tows in the regions (Figure 3) occupied on *Jordan* cruise 9910JD and *McArthur* cruise 9910M4. Number in parenthesis below region number is number of tows in that region.

	Region								
	1	2	3	4	5	6	7	8	10
	(17)	(36)	(35)	(36)	(28)	(15)	(7)	(20)	(2)
Taxon									
Albula spp.	0.4	-	-	-	-	-	-	-	-
Muraenidae	-	-	0.0	-	-	-	-	-	-
Gymnothorax mordax	0.1	-	-	-	-	-	-	-	-
Ariosoma gilberti	-	-	0.0	0.1	-	-	-	-	-
Clupeidae	0.1	-	-	-	-	-	-	-	-
Opisthonema spp.	56.8	0.1	4.2	0.9	-	-	-	-	-
Sardinops sagax	-	0.1	-	-	-	-	-	-	-
Engraulidae	-	-	0.0	-	-	-	-	-	-
Anchoa spp.	-	-	0.0	-	-	-	-	0.1	-
Cetengraulis mysticetus	9.4	-	3.5	-	-	-	-	-	-
Engraulis mordax	-	0.0	-	-	-	-	-	-	-
Engraulis ringens	-	-	-	-	-	-	-	0.1	-
Cyclothone spp.	-	0.1	0.2	-	0.1	-	-	0.6	-
Cyclothone signata	-	0.1	-	-	-	-	-	-	-
Diplophos proximus	0.1	-	-	0.1	0.0	-	-	-	-
Sternoptyx spp.	-	-	-	-	-	0.0	-	0.1	-
Vinciguerria lucetia	3.1	3.7	15.6	12.1	5.0	0.9	0.7	8.8	-
Vinciguerria poweriae	-	0.1	-	-	-	-	-	-	-
Astronesthinae	-	-	0.1	-	-	-	-	-	-
Bathophilus filifer	-	-	-	0.0	-	-	-	-	-
Synodus spp.	0.2	-	0.0	-	-	-	-	-	-
Synodus evermanni	-	-	0.2	-	-	-	-	-	-
Synodus lucioceps	0.4	-	-	-	-	-	-	-	-
Synodus scituliceps	-	-	-	-	-	-	-	0.1	-
Synodus sechurae	-	-	-	-	-	-	-	0.1	-
Lestidiops neles	-	0.0	0.1	-	-	-	-	-	-
Lestidium spp.	-	-	0.0	0.0	0.4	0.2	-	-	-
Stemonosudis macrura	-	-	0.0	-	-	-	-	-	-
Ceratoscopelus townsendi	-	0.0	-	-	-	-	-	-	-
Ceratoscopelus warmingii	-	-	-	-	-	-	-	0.4	-
Diaphus spp.	0.1	0.1	0.0	0.2	0.2	-	-	-	-
Lampadena urophaos	-	-	-	-	0.0	-	-	-	-
Lampanyctus spp.	-	-	0.5	-	-	-	-	0.1	-
Lampanyctus parvicauda	-	-	0.4	0.2	0.1	-	-	0.2	-
Stenobrachius leucopsarus	-	0.0	-	-	-	-	-	-	-
Benthosema panamense	0.2	0.3	0.8	-	-	-	-	-	-
Diogenichthys laternatus	-	-	0.0	-	-	-	-	-	-
Symbolophorus evermanni	-	-	-	0.0	-	-	-	-	-
Trachipterus altivelis	-	-	-	-	-	0.0	-	-	-
Bregmaceros bathymaster	-	-	2.9	-	-	-	-	-	-
Lepophidium spp.	-	-	0.0	-	-	-	-	-	-

Taxon	Region 1	2	3	4	5	6	7	8	10
Bythitidae	-	-	-	0.0	-	-	-	-	-
Zalieutes elater	-	-	0.1	-	-	-	-	-	-
Melanocetus spp.	-	0.0	0.0	0.1	0.0	-	-	-	-
Oneirodes spp.	-	-	-	-	-	-	-	0.1	-
Centrophryne spinulosa	-	-	-	-	-	0.0	-	-	-
Gigantactis spp.	-	-	0.1	-	-	-	-	-	-
Atherinella spp.	-	-	-	-	-	-	-	0.1	-
Cololabis saira	-	1.7	-	-	-	-	-	-	-
Scomberesox saurus	-	-	-	-	-	-	-	0.4	-
Hemiramphus saltator	-	-	0.2	-	-	-	-	-	-
Cheilopogon spp.	-	0.0	-	-	-	0.0	0.1	-	-
Cheilopogon dorsomaculata	-	-	-	-	0.0	-	-	-	-
Cheilopogon pinnatibarbatus	-	0.1	-	-	-	-	-	-	-
Cheilopogon xenopterus	-	0.0	0.1	0.1	-	0.0	0.1	-	-
Exocoetus spp.	0.0	0.1	0.0	0.0	0.1	-	-	-	-
Exocoetus monocirrhus	-	-	-	-	0.0	-	-	-	-
Fodiator acutus	0.1	-	-	-	-	-	-	-	-
Hirundichthys spp.	0.4	0.0	0.2	-	0.2	-	-	-	-
Hirundichthys marginatus	-	0.0	0.1	0.1	0.2	0.0	-	-	-
Oxyporhamphus micropterus	6.2	0.6	5.1	1.9	1.4	0.1	-	-	-
Prognichthys spp.	6.1	0.0	3.2	0.4	-	-	-	-	-
Scopelogadus bispinosus	-	-	-	-	-	-	-	0.1	-
Scorpaenidae	-	0.0	-	-	-	-	-	-	-
Pontinus spp.	-	-	0.5	-	-	-	-	0.1	-
Scorpaena spp.	0.1	-	-	-	-	-	-	-	-
Scorpaenodes xyris	-	-	0.1	-	-	-	-	-	-
Howella pammelas	-	-	-	0.0	-	-	-	-	-
Serraninae	-	0.0	-	-	-	-	-	-	-
Pronotogrammus multifasciatus	-	0.1	-	-	-	-	-	0.1	-
Epinephelinae	-	0.1	-	-	-	-	-	-	-
Carangidae	-	-	-	-	0.2	-	-	-	-
Caranx caballus	1.1	0.0	0.1	0.2	-	-	-	-	-
Chloroscombrus orqueta	0.5	-	0.1	-	-	-	-	-	-
Gnathanodon speciosus	0.0	-	-	-	-	-	-	-	-
Naucrates ductor	0.0	0.0	0.1	0.0	-	0.0	0.1	-	0.3
Oligoplites spp.	0.1	-	-	-	-	-	-	-	-
Selar crumenophthalmus	0.1	0.1	-	0.1	0.1	-	-	-	-
Selene peruviana	-	0.0	-	-	-	-	-	-	-
Seriola spp.	-	-	0.1	-	-	-	-	-	-
Trachinotus rhodopus	0.4	-	0.1	-	-	-	-	-	-
Coryphaena spp.	-	-	0.1	0.1	0.1	-	-	-	-
Coryphaena equiselis	1.2	0.3	0.9	0.9	0.8	0.2	0.3	-	-
Coryphaena hippurus	0.5	0.2	1.0	0.4	-	-	-	-	-
Brama dussumieri	-	-	-	-	0.1	-	-	0.1	-
Caristius maderensis	-	-	-	0.0	-	-	-	-	-
Lutjanidae	0.1	-	-	-	-	-	-	-	-
Lutjanus spp.	0.3	-	-	-	-	-	-	-	-
Lutjanus peru	-	0.3	-	-	-	-	-	-	-

Taxon	Region 1	2	3	4	5	6	7	8	10
Gerreidae	3.4	0.0	1.0	0.0	-	-	-	-	-
Haemulidae	2.4	0.1	-	-	-	-	-	-	-
Xenistius californiensis	-	0.2	-	-	-	-	-	-	-
Calamus brachysomus	-	0.0	-	-	-	-	-	-	-
Sciaenidae	0.2	-	-	-	-	-	-	-	-
Kyphosus spp.	-	-	0.0	-	-	-	-	-	-
Medialuna californiensis	-	0.0	-	-	-	-	-	-	-
Mugil spp.	3.0	0.2	0.3	0.1	-	-	-	-	-
Polydactylus approximans	8.5	-	0.4	-	-	-	-	-	-
Polydactylus opercularis	0.5	-	0.0	-	-	-	-	-	-
Pomacentridae	-	0.0	-	0.0	-	-	-	-	-
Hypsypops rubicundus	-	0.1	-	-	-	-	-	-	-
Microspathodon spp.	0.1	-	-	-	-	-	-	-	-
Chiasmodon niger	-	0.0	-	-	-	-	-	-	-
Ammodytoides gilli	-	0.1	-	-	-	-	-	-	-
Paraclinus spp.	-	0.1	-	-	-	-	-	-	-
Entomacrodus chiostictus	-	-	-	0.1	-	-	-	-	-
Hypsoblennius gilberti	-	0.0	-	-	-	-	-	-	-
Ophioblennius steindachneri	-	0.0	-	-	-	-	-	-	-
Synchiropus atrilabiatus	-	-	0.0	-	-	-	-	-	-
Eleotridae	-	-	0.4	-	-	-	-	-	-
Gobiidae	0.1	0.1	0.6	-	-	-	-	-	-
Chaetodipterus zonatus	0.1	-	-	-	-	-	-	-	-
Sphyraena ensis	0.3	-	-	-	-	-	-	-	-
Nealotus tripes	-	-	0.1	0.0	-	-	-	-	-
Istiophorus platypterus	0.0	-	-	0.0	-	-	-	-	-
Auxis spp.	9.6	1.8	2.1	2.5	1.1	-	-	-	-
Euthynnus lineatus	0.5	-	-	0.0	-	-	-	-	-
Katsuwonus pelamis	-	-	-	-	0.2	-	0.1	-	-
Sarda chiliensis	0.1	-	-	-	-	-	-	-	-
Scomber japonicus	-	0.0	-	-	-	-	-	-	-
Thunnus spp.	-	0.0	-	0.1	0.2	0.0	-	-	-
Cubiceps baxteri	-	0.0	-	-	-	-	-	-	-
Cubiceps pauciradiatus	0.3	0.2	0.8	0.3	2.1	-	-	-	-
Nomeus gronovii	-	-	-	0.0	-	-	-	-	-
Psenes pellucidus	-	-	0.0	0.0	-	-	-	-	-
Psenes sio	-	-	0.0	-	-	-	-	-	-
Tetragonurus cuvieri	-	0.1	-	-	-	-	-	-	-
Citharichthys platophrys	-	-	0.1	0.0	-	-	-	-	-
Syacium ovale	0.4	-	0.1	-	-	-	-	-	-
Bothus spp.	0.1	0.2	0.1	0.3	-	-	-	-	-
Monolene spp.	-	0.0	0.1	-	-	-	-	-	-
Symphurus spp.	0.6	0.0	0.5	-	-	-	-	-	-
Canthidermis maculatus	0.4	-	0.0	0.1	-	-	-	-	-
Lactoria diaphana	-	-	-	-	0.0	-	-	-	-
Ostracion meleagris	-	-	0.1	-	-	-	-	-	-
Diodon spp.	0.1	-	-	-	-	-	-	-	-
Unidentified fish larvae	-	-	-	-	0.0	-	-	-	-

Table 6. Numbers (raw counts) and size ranges of juvenile fishes taken in Manta tows on *Jordan* cruise 9910JD and *McArthur* cruise 9910M4. Some larger specimens (e.g., myctophids) may be adults.

STOMIIFORMES
Stomiidae
Astronesthinae

Astronesthes gibbsi
M4 13 (1) 37 mm; **M4 15** (1) 24 mm; **M4 31** (1) 27 mm; **M4 32** (1) 28 mm; **M4 71** (1) 64 mm.

MYCTOPHIFORMES
Myctophidae
Lampanyctinae

Lampanyctus omostigma
M4 35 (1) 45 mm; **M4 49** (3) 49–54 mm; **M4 71** (1) 51 mm; **M4 73** (3) 39–47 mm.

Myctophinae

Centrobranchus nigroocellatus
M4 4 (1) 18 mm.

Gonichthys tenuiculus
JD 5 (1) 17 mm; **JD 7** (1) 16 mm; **JD 29** (1) 16 mm; **JD 30** (1) 16 mm; **JD 31** (3) 15–34 mm; **JD 53** (3) 15–16 mm; **JD 75** (6) 16–42 mm; **JD 76** (8) 17–21 mm; **JD 77** (1) 16 mm; **JD 87** (1) 45 mm.

M4 8 (1) 19 mm; **M4 10** (1) 39 mm; **M4 14** (2) 21–42 mm; **M4 15** (21) 16–41 mm; **M4 16** (2) 17 mm; **M4 19** (3) 17–18 mm; **M4 23** (3) 36–44 mm; **M4 24** (1) 38 mm; **M4 26** (4) 37–44 mm; **M4 28** (5) 16 mm; **M4 29** (3) 22–43 mm; **M4 30** (1) 21 mm; **M4 31** (19) 16–33 mm; **M4 32** (18) 16–40 mm; **M4 33** (2) 26–43 mm; **M4 36** (9) 15–42 mm; **M4 37** (4) 17–33 mm; **M4 39** (18) 23–44 mm; **M4 40** (7) 16–17 mm; **M4 41** (22) 15–43 mm; **M4 42** (11) 18–41 mm; **M4 43** (5) 21–23 mm; **M4 44** (7) 15–16 mm; **M4 45** (3) 15–17 mm; **M4 48** (30) 15–39 mm; **M4 49** (1) 15 mm; **M4 50** (5) 16–19 mm; **M4 55** (1) 18 mm; **M4 56** (3) 24–30 mm; **M4 57** (3) 33–42 mm; **M4 59** (1) 20 mm; **M4 65** (1) 23 mm; **M4 66** (7) 15–38 mm; **M4 67** (10) 27–41 mm; **M4 68** (29) 15–24 mm; **M4 69** (15) 22–43 mm; **M4 70** (1) 39 mm; **M4 71** (3) 17–18 mm; **M4 72** (2) 17–33 mm; **M4 74** (2) 16 mm; **M4 86** (1) 17 mm; **M4 88** (5) 27–31 mm; **M4 89** (4) 18–23 mm; **M4 90** (1) 20 mm; **M4 91** (3) 18–21 mm; **M4 93** (1) 22 mm; **M4 94** (14) 16–43 mm; **M4 95** (5) 15–19 mm; **M4 96** (4) 18–50 mm; **M4 97** (3) 16–50 mm.

Hygophum atratum
JD 19 (1) 13 mm.

Hygophum proximum
M4 18 (2) 45–46 mm; **M4 19** (11) 36–39 mm; **M4 20** (4) 39–42 mm; **M4 22** (4) 14–17 mm; **M4 23** (5) 14–15 mm; **M4 27** (10) 37–42 mm; **M4 28** (1) 42 mm; **M4 29** (18) 36–42 mm; **M4 36** (2) 22–46 mm; **M4 37** (5) 14–23 mm; **M4 38** (4) 14–43 mm; **M4 39** (5) 14–36 mm; **M4 40** (2) 14–22 mm; **M4 42** (1) 37 mm; **M4 67** (1) 41 mm; **M4 70** (1) 42 mm; **M4 80** (1) 24 mm; **M4 84** (1) 16 mm; **M4 85** (3) 23 mm; **M4 88** (1) 43 mm.

Hygophum reinhardtii
JD 9 (1) 13 mm; **JD 65** (1) 16 mm.

M4 2 (1) 35 mm.

Myctophum asperum
JD 26 (1) 44 mm.

M4 9 (2) 55–61 mm; **M4 12** (1) 46 mm; **M4 13** (4) 44–52 mm; **M4 15** (1) 46 mm; **M4 16** (2) 15 mm; **M4 17** (1) 16 mm; **M4 18** (1) 24 mm; **M4 19** (2) 41–48 mm; **M4 21** (1) 16 mm; **M4 25** (1) 16 mm; **M4 28** (1) 16 mm; **M4 33** (3) 47–54 mm; **M4 34** (1) 50 mm; **M4 35** (5) 15–52 mm; **M4 66** (1) 43 mm; **M4 69** (1) 53 mm; **M4 70** (4) 49–53 mm; **M4 71** (1) 52 mm.

Myctophum aurolaternatum
JD 5 (1) 27 mm; **JD 10** (7) 23–30 mm; **JD 11** (1) 27 mm; **JD 16** (1) 28 mm; **JD 31** (1) 54 mm; **JD 34** (1) 39 mm; **JD 75** (5) 21–29 mm; **JD 76** (1) 24 mm; **JD 91** (1) 31 mm.

M4 7 (1) 28 mm; **M4 29** (3) 37–74 mm; **M4 31** (1) 29 mm; **M4 32** (5) 24–27 mm; **M4 33** (2) 31–39 mm; **M4 36** (4) 31–34 mm; **M4 39** (1) 41 mm; **M4 44** (1) 51 mm; **M4 45** (1) 26 mm; **M4 49** (1) 28 mm; **M4 50** (1) 90 mm; **M4 52** (1) 39 mm; **M4 54** (1) 76 mm; **M4 55** (1) 88 mm; **M4 56** (3) 26–28 mm; **M4 63** (7) 25–38 mm; **M4 64** (2) 29–48 mm; **M4 65** (1) 28 mm; **M4 67** (2) 26–79 mm; **M4 68** (1) 24 mm; **M4 73** (3) 25–49 mm; **M4 74** (1) 40 mm; **M4 75** (3) 27–48 mm; **M4 76** (4) 25–26 mm; **M4 77** (2) 25 mm; **M4 78** (3) 25–41 mm; **M4 80** (2) 35–39 mm; **M4 81** (1) 32 mm; **M4 82** (2) 56–62 mm; **M4 84** (2) 29–39 mm; **M4 86** (2) 27–29 mm; **M4 88** (2) 28–31 mm.

Myctophum lychnobium
JD 78 (1) 16 mm.

M4 9 (1) 72 mm; **M4 10** (6) 17–77 mm; **M4 11** (2) 58–64 mm; **M4 12** (2) 16–17 mm; **M4 13** (4) 17–74 mm; **M4 15** (3) 27–28 mm; **M4 16** (4) 18–70 mm; **M4 17** (1) 65 mm; **M4 19** (2) 28 mm; **M4 20** (1) 17 mm; **M4 33** (7) 18–77 mm; **M4 35** (2) 17–19 mm; **M4 36** (1) 20 mm; **M4 70** (6) 23–77 mm; **M4 71** (1) 32 mm.

Myctophum nitidulum
JD 29 (1) 28 mm; **JD 56** (2) 19–53 mm; **JD 57** (1) 35 mm; **JD 68** (1) 24 mm; **JD 72** (2) 16 mm; **JD 75** (16) 15–23 mm; **JD 76** (18) 15–23 mm; **JD 78** (1) 18 mm; **JD 79** (1) 18 mm; **JD 97** (1) 19 mm; **JD 99** (1) 34 mm.

M4 2 (1) 52 mm; **M4 3** (1) 76 mm; **M4 5** (1) 16 mm; **M4 9** (4) 22–49 mm; **M4 10** (15) 15–59 mm; **M4 11** (3) 16–17 mm; **M4 12** (21) 16–48 mm; **M4 13** (3) 14–39 mm; **M4 14** (1) 34 mm; **M4 15** (13) 17–49 mm; **M4 16** (6) 17–48 mm; **M4 17** (7) 16–19 mm; **M4 18** (6) 17–56 mm; **M4 20** (1) 48 mm; **M4 22** (3) 21–36 mm; **M4 23** (4) 18–29 mm; **M4 25** (1) 20 mm; **M4 26** (1) 31 mm; **M4 27** (4) 15–45 mm; **M4 28** (2) 25–37 mm; **M4 29** (3) 18–29 mm; **M4 30** (1) 22 mm; **M4 31** (1) 18 mm; **M4 33** (1) 47 mm; **M4 34** (5) 17–41 mm; **M4 35** (8) 17–51 mm; **M4 36** (93) 17–61 mm; **M4 37** (26) 16–42 mm; **M4 38** (5) 18–36 mm; **M4 39** (70) 17–62 mm; **M4 40** (6) 19–49 mm; **M4 42** (3) 18–32 mm; **M4 43** (1) 23 mm; **M4 49** (1) 16 mm; **M4 56** (1) 29 mm; **M4 70** (1) 53 mm; **M4 71** (1) 47 mm; **M4 91** (2) 20–22 mm; **M4 92** (1) 23 mm; **M4 93** (1) 40 mm; **M4 94** (7) 26–61 mm; **M4 95** (4) 27–40 mm; **M4 96** (3) 24–35 mm; **M4 97** (10) 18–71 mm; **M4 98** (6) 17–69 mm.

Symbolophorus californiensis
M4 96 (6) 29–50 mm; **M4 98** (1) 52 mm.

Symbolophorus evermanni
JD 29 (1) 19 mm; **JD 30** (1) 21 mm; **JD 31** (1) 48 mm; **JD 72** (1) 19 mm; **JD 75** (1) 25 mm; **JD 78** (2) 66–72 mm; **JD 90** (1) 50 mm.

M4 6 (4) 25–34 mm; **M4 8** (5) 25–59 mm; **M4 11** (2) 29–48 mm; **M4 12** (1) 48 mm; **M4 13** (1) 21 mm; **M4 14** (8) 20–66 mm; **M4 15** (4) 22–63 mm; **M4 16** (1) 22 mm; **M4 19** (3) 24–55 mm; **M4 20** (4) 22–53 mm; **M4 22** (4) 33–53 mm; **M4 23** (19) 28–70 mm; **M4 26** (2) 24–41 mm; **M4 27** (4) 21–26 mm; **M4 28** (7) 20–68 mm; **M4 29** (4) 22–48 mm; **M4 30** (21) 20–27 mm; **M4 31** (18) 20–60 mm; **M4 32** (8) 20–63 mm; **M4 35** (1) 59 mm; **M4 42** (1) 66 mm; **M4 50** (1) 69 mm; **M4 56** (1) 51 mm; **M4 64** (1) 33 mm; **M4 65** (1) 56 mm; **M4 66** (6) 19–69 mm; **M4 67** (6) 19–54 mm; **M4 68** (4) 28–57 mm; **M4 69** (3) 26–64 mm; **M4 70** (6) 19–21 mm; **M4 71** (28) 19–26 mm; **M4 73** (2) 52–58 mm; **M4 75** (1) 58 mm; **M4 80** (1) 63 mm; **M4 88** (5) 29–45 mm.

BELONIFORMES
Scomberesocidae

Cololabis saira
M4 91 (1) 52 mm.

Scomberesox saurus
JD 71 (2) 22–24 mm.

Exocoetidae

Exocoetus monocirrhus
M4 16 (1) 46 mm; **M4 51** (1) 31 mm; **M4 66** (1) 42 mm.

Exocoetus volitans
M4 13 (1) 28 mm; **M4 18** (1) 28 mm; **M4 20** (1) 35 mm; **M4 21** (3) 25–30 mm; **M4 25** (1) 31 mm; **M4 29** (1) 27 mm; **M4 31** (1) 71 mm; **M4 34** (1) 37 mm.

Hirundichthys marginatus
M4 51 (1) 31mm.

Hirundichthys speculiger
M4 66 (1) 40 mm.

Oxyporhamphus micropterus
M4 54 (3) 28–36 mm; **M4 82** (1) 135 mm.

Prognichthys tringa
JD 13 (2) 15–16 mm; **JD 43** (1) 16 mm; **JD 81** (1) 15 mm.

M4 43 (1) 20 mm; **M4 52** (1) 16 mm; **M4 60** (1) 13 mm; **M4 62** (1) 16 mm; **M4 82** (1) 13 mm.

SYNGNATHIFORMES
Syngnathidae

Syngnathus sp.
JD 2 (1) 33 mm.

PERCIFORMES

Carangidae

Alectis ciliaris
M4 61 (1) 28 mm.

Caranx caballus
JD 12 (1) 31 mm; **JD 15** (1) 19 mm.

M4 83 (1) 19 mm.

Seriola lalandi
JD 4 (1) 23 mm.

Trachinotus rhodopus
M4 61 (1) 24 mm.

Coryphaenidae

Coryphaena equiselis
JD 53 (1) 27 mm.

M4 25 (1) 23 mm; **M4 42** (1) 23 mm; **M4 48** (1) 25 mm; **M4 50** (1) 21 mm; **M4 51** (2) 23–25 mm; **M4 55** (1) 20 mm; **M4 61** (1) 21 mm; **M4 78** (1) 19 mm; **M4 82** (2) 24–27 mm; **M4 85** (1) 25 mm; **M4 87** (1) 111 mm.

Coryphaena hippurus
M4 55 (1) 37 mm; **M4 83** (6) 25–43 mm.

Polynemidae

Polydactylus approximans
JD 13 (2) 24–27 mm; **JD 15** (1) 27 mm.

M4 61 (1) 18 mm; **M4 83** (23) 18–30 mm.

Polydactylus opercularis
M4 83 (12) 20–33 mm.

Cheilodactylidae

Cheilodactylus variegatus
JD 75 (1) 23 mm.

Mugilidae

Mugil curema
JD 49 (2) 16–19 mm.

M4 44 (1) 28 mm; **M4 45** (2) 18–24 mm; **M4 46** (3) 17–21 mm; **M4 47** (1) 23 mm; **M4 48** (4) 15–23 mm; **M4 51** (2) 23–25 mm; **M4 60** (2) 14–22 mm; **M4 61** (7) 13–24 mm.

Mugil spp.
JD 6 (1) 14 mm; **JD 42** (1) 13 mm; **JD 43** (2) 11–15 mm.

Pomacentridae

Chromis punctipinnis
M4 96 (1) 21 mm.

Scombridae

Auxis thazard
M4 48 (1) 32 mm; **M4 51** (2) 29–39 mm.

Nomiidae

Nomeus gronovii
M4 57 (7) 10–14 mm; **M4 65** (2) 15–21 mm.

TETRAODONTIFORMES

Balistidae

Canthidermis maculatus
M4 82 (3) 11–21 mm; **M4 83** (1) 19 mm; **M4 84** (1) 24 mm.

Tetraodontidae

Sphoeroides rosenblatti
M4 83 (1) 12 mm.

Diodontidae

Diodon eydouxii
JD 89 (1) 8 mm.

Diodon holocanthus
M4 83 (18) 5–26 mm; **M4 86** (1) 9 mm.

Table 7. Station and bongo net tow data for *McArthur* cruise 9910M4.

Tow Number	CTD Station	Lat. deg. min.	Long.(W) deg. min.	Region	Ship Code	Tow Date yymmdd	Time (Loc.)	Tow Depth	Vol.(m^3) Water Strained	Standard Haul Factor	Plankton Volume	Percent Sorted	Total Larvae	Total Eggs
1	1-001	31 18.9 N	116 58.8	2	M4	990728	2234	207	520.9	3.97	67	51	42	16
2	1-003	30 00.0 N	120 19.8	2	M4	990729	2240	202	596.1	3.39	54	47	333	150
3	1-005	27 25.4 N	122 06.2	2	M4	990730	2232	201	559.4	3.60	36	100	982	8
4	1-007	23 45.6 N	122 05.1	2	M4	990731	2235	206	410.8	5.00	61	100	188	1
5	1-009	20 19.6 N	122 05.5	2	M4	990801	2220	195	542.1	3.60	37	100	98	18
6	1-011	17 04.1 N	122 04.4	2	M4	990802	2218	208	496.4	4.20	85	52	78	23
7	1-013	13 47.1 N	122 03.3	5	M4	990803	2210	196	508.8	3.86	65	54	169	20
8	1-015	10 32.7 N	122 06.2	5	M4	990804	2220	195	531.1	3.68	151	50	119	37
9		7 14.5 N	122 01.5	5	M4	990805	2217	206	522.9	3.94	84	48	327	24
10	1-019	4 55.9 N	122 05.5	5	M4	990806	2154	199	558.7	3.56	77	49	250	143
11		3 33.2 N	123 02.1	5	M4	990807	2156	217	414.9	5.23	60	100	114	140
12	1-022	5 09.2 N	124 12.9	5	M4	990808	2152	202	537.4	3.76	87	53	225	1914
13	1-024	7 03.0 N	125 43.9	6	M4	990809	2145	203	514.2	3.94	175	49	160	14
14	1-026	9 15.9 N	127 42.7	6	M4	990810	2107	211	488.2	4.33	104	49	8	2
15	1-028	7 36.2 N	130 29.2	6	M4	990811	2133	206	530.4	3.89	136	51	227	8
16	1-030	6 05.6 N	133 08.7	6	M4	990812	2144	209	611.0	3.42	74	53	376	9
17	1-032	4 28.9 N	135 58.9	6	M4	990813	2149	209	494.5	4.24	79	49	618	28
18	1-034	5 03.0 N	138 28.4	6	M4	990814	2147	236	512.0	4.62	88	51	167	41
19	1-036	7 59.7 N	139 35.5	6	M4	990815	2125	197	626.4	3.14	142	49	166	9
21	1-040	5 04.5 N	144 01.2	7	M4	990817	2216	210	461.8	4.54	106	51	154	13
22	1-042	7 48.6 N	145 24.2	7	M4	990818	2114	203	556.7	3.65	120	49	86	21
23	1-044	10 11.6 N	146 41.2	7	M4	990819	2149	209	491.8	4.24	116	47	126	81
27	2-052	13 47.7 N	139 43.3	6	M4	990905	2113	197	488.3	4.03	49	100	43	3
28	2-054	14 24.1 N	137 01.9	6	M4	990906	2104	200	493.7	4.05	47	100	236	68
35	2-068	1 56.1 N	124 39.1	5	M4	990913	2104	218	412.6	5.29	109	47	34	20
36	2-070	0 08.3 N	122 38.4	5	M4	990914	2104	210	436.8	4.80	140	51	77	2
37	2-072	2 14.8 N	120 32.0	5	M4	990915	2056	212	393.1	5.39	155	51	89	13
54	3-115	12 01.1 N	94 59.6	3	M4	991015	2029	213	486.0	4.38	206	51	25	5
56	3-119	6 34.5 N	97 32.3	4	M4	991017	2113	206	531.5	3.88	149	52	866	32
57	3-121	6 51.9 N	98 20.0	4	M4	991018	2047	212	463.6	4.58	173	50	670	99
58	3-123	10 06.5 N	98 25.4	4	M4	991019	2115	210	490.9	4.28	200	49	114	62
59	3-125	11 04.5 N	98 26.7	4	M4	991020	2105	210	503.4	4.17	193	48	117	78
60	3-127	13 30.4 N	98 17.2	4	M4	991021	2117	206	540.3	3.81	157	49	103	28
61	3-129	15 56.4 N	98 39.7	1	M4	991022	2043	206	501.9	4.10	116	53	397	167
62	4-130	16 08.3 N	101 12.8	1	M4	991027	2225	210	436.9	4.80	105	46	83	22

Tow Number	CTD Station	Lat. deg. min.	Long.(W) deg. min.	Region	Ship Code	Tow Date yymmdd	Time (Loc.)	Tow Depth	Vol.(m^3) Water Strained	Standard Haul Factor	Plankton Volume	Percent Sorted	Total Larvae	Total Eggs
63	4-132	13 01.3 N	102 23.8	4	M4	991028	2059	213	461.8	4.61	136	51	123	113
64	4-134	9 43.7 N	103 21.7	4	M4	991029	2130	209	473.0	4.43	118	48	68	62
65	4-136	6 31.9 N	104 18.5	4	M4	991030	2115	208	475.6	4.38	107	53	313	584
66	4-138	6 21.6 N	106 02.2	4	M4	991031	2149	208	485.4	4.28	89	46	528	36
67	4-140	8 41.2 N	108 15.0	4	M4	991101	2111	213	467.1	4.55	111	52	190	14
68	4-142	10 14.5 N	109 12.9	4	M4	991102	2232	204	503.5	4.06	135	50	98	49
69	4-144	7 58.1 N	110 48.1	5	M4	991103	2029	204	523.7	3.89	118	50	63	14
70	4-146	5 47.8 N	113 07.7	5	M4	991104	2108	211	433.9	4.87	122	51	117	10
71	4-148	7 13.9 N	115 00.2	5	M4	991105	2057	208	485.2	4.29	82	50	100	10
72	4-150	9 58.0 N	116 53.5	5	M4	991106	2121	210	490.5	4.28	92	49	194	26
73	4-152	12 44.5 N	118 50.6	5	M4	991107	2100	191	515.5	3.70	99	51	95	37
74	4-154	14 22.9 N	116 20.2	5	M4	991108	2104	210	474.8	4.42	46	100	124	595
75	4-156	12 34.2 N	113 41.5	5	M4	991109	2039	209	445.6	4.69	146	49	77	36
76	4-158	15 29.3 N	113 07.9	2	M4	991110	2105	210	474.2	4.42	95	47	140	442
77	4-160	15 34.6 N	110 06.5	2	M4	991111	2024	209	474.2	4.42	61	48	100	347
78	4-162	13 08.7 N	108 02.4	4	M4	991112	2050	208	481.2	4.31	110	51	99	306
79	4-164	13 08.1 N	109 18.3	4	M4	991113	2024	209	474.8	4.40	51	100	76	1382
80	4-166	12 20.6 N	106 51.3	4	M4	991114	2050	209	463.3	4.50	110	49	153	147
81	4-168	14 55.3 N	105 29.2	4	M4	991115	1958	208	478.7	4.34	117	52	119	274
83	5-170	18 51.1 N	105 38.1	1	M4	991121	2124	208	472.5	4.40	135	52	104	1976
84	5-172	17 07.1 N	108 24.2	1	M4	991122	2025	211	466.4	4.53	90	52	124	78
85	5-174	17 36.7 N	111 13.7	2	M4	991123	2049	211	461.6	4.58	78	53	92	472
86	5-176	16 21.4 N	114 12.4	2	M4	991124	2116	210	517.7	4.06	81	52	36	291
87	5-178	15 34.9 N	117 03.8	2	M4	991125	2050	210	507.8	4.13	49	100	275	42
89	5-182	16 52.0 N	117 57.6	2	M4	991127	2053	211	468.2	4.51	47	100	489	15
90	5-184	18 58.6 N	115 51.6	2	M4	991128	2114	211	471.4	4.48	30	100	52	170
91	5-186	19 09.4 N	119 14.8	2	M4	991129	2107	203	485.9	4.17	47	100	147	17
92	5-188	21 21.7 N	117 53.2	2	M4	991130	2107	208	531.8	3.91	73	49	81	60
93	5-190	22 19.8 N	115 22.4	2	M4	991201	2024	209	477.3	4.38	69	48	72	191
94		23 19.0 N	117 49.7	2	M4	991202	1956	209	470.0	4.45	53	100	111	11
95	5-193	23 54.6 N	119 52.1	2	M4	991203	2030	209	504.3	4.14	63	53	41	25
96	5-195	24 55.9 N	117 33.8	2	M4	991204	2051	208	474.1	4.38	148	48	13	14
97	5-197	26 45.9 N	117 38.9	2	M4	991205	2020	211	455.6	4.63	55	100	26	40
98	5-199	29 07.1 N	117 50.9	2	M4	991206	2032	209	439.0	4.76	57	100	36	61

TABLE 8. Pooled occurrences of fish larvae taken in bongo net tows on *McArthur* cruise 9910M4.

Rank	Taxon	Occurrences
1	*Vinciguerria lucetia*	69
2	*Diogenichthys laternatus*	63
3	*Diaphus* spp.	53
4	*Lampanyctus* spp.	36
5	*Cubiceps pauciradiatus*	33
5	*Bregmaceros* spp.	33
7	*Bathylagus* spp.	32
8	*Lampanyctus parvicauda*	29
9	*Scopelogadus bispinosus*	26
10	*Sternoptyx* spp.	21
10	*Scopelarchoides nicholsi*	21
12	*Auxis* spp.	20
12	*Bathophilus filifer*	20
14	*Cyclothone* spp.	19
14	*Idiacanthus* spp.	19
16	*Lestidiops neles*	18
17	*Myctophum aurolaternatum*	17
18	Myctophidae	16
18	*Lestidium* spp.	16
18	*Melamphaes* spp.	16
18	*Hygophum proximum*	16
22	*Notolychnus valdiviae*	15
22	*Symbolophorus evermanni*	15
22	*Myctophum nitidulum*	15
25	*Stemonosudis macrura*	14
25	*Diplophos proximus*	14
27	Unidentified fish larvae	13
27	*Chiasmodon niger*	13
27	Disintegrated fish larvae	13
27	*Gempylus serpens*	13
27	*Hygophum atratum*	13
32	*Cyclothone acclinidens*	11
33	*Evermannella ahlstromi*	10
34	*Oxyporhamphus micropterus*	9
34	*Lampadena urophaos*	9
34	*Cyclothone signata*	9
37	*Howella pammelas*	8
37	*Brama dussumieri*	8
37	*Rosenblattichthys volucris*	8
37	Eleotridae	8
37	*Psenes sio*	8
42	*Gonichthys tenuiculus*	7
42	*Bolinichthys longipes*	7
42	*Thunnus* spp.	7
45	*Myctophum* spp.	6
45	*Loweina rara*	6
45	*Ceratoscopelus warmingii*	6
45	*Oneirodes* spp.	6
45	*Chauliodus* spp.	6

TABLE 8. (cont.)

Rank	Taxon	Occurrences
45	*Ceratoscopelus townsendi*	6
45	*Coryphaena equiselis*	6
52	*Notoscopelus resplendens*	5
52	*Howella* spp.	5
52	*Argyropelecus sladeni*	5
55	*Bothus* spp.	4
55	*Triphoturus mexicanus*	4
55	*Syacium ovale*	4
55	*Bathylagus nigrigenys*	4
55	*Myctophum asperum*	4
55	Gobiidae	4
55	Stomiiformes	4
62	*Protomyctophum crockeri*	3
62	*Symphurus* spp.	3
62	*Trachipterus fukuzakii*	3
62	*Nannobrachium idostigma*	3
62	*Coryphaena hippurus*	3
62	*Caranx* spp.	3
62	*Nealotus tripes*	3
62	*Katsuwonus pelamis*	3
62	*Macroramphosus gracilis*	3
62	*Eustomias* spp.	3
62	*Benthosema panamense*	3
62	*Lestidiops* spp.	3
74	*Cubiceps baxteri*	2
74	*Argyropelecus* spp.	2
74	*Psenes arafurensis*	2
74	*Ichthyococcus irregularis*	2
74	*Stomias atriventer*	2
74	*Stomias* spp.	2
74	*Nannobrachium bristori*	2
74	*Scopelengys* spp.	2
74	*Tetragonurus cuvieri*	2
74	*Triphoturus nigrescens*	2
74	Melanostomiinae	2
74	*Symbolophorus californiensis*	2
74	*Diplophos taenia*	2
74	*Diogenichthys atlanticus*	2
74	*Synchiropus atrilabiatus*	2
74	*Melamphaes lugubris*	2
74	*Hygophum* spp.	2
74	*Melanocetus* spp.	2
74	*Cheilopogon xenopterus*	2
74	*Bregmaceros bathymaster*	2
74	*Nezumia* spp.	2
74	Anthiinae	2
96	Clupeidae	1
96	Astronesthinae	1
96	*Avocettina bowersi*	1
96	*Ariosoma gilberti*	1
96	*Ophichthus zophochir*	1
96	*Myrophis vafer*	1

TABLE 8. (cont.)

Rank	Taxon	Occurrences
96	*Paraconger californiensis*	1
96	*Opisthonema* spp.	1
96	*Nansenia crassa*	1
96	*Tactostoma macropus*	1
96	Balistidae	1
96	Paralichthyidae	1
96	*Citharichthys platophrys*	1
96	*Danaphos oculatus*	1
96	*Symphurus callopterus*	1
96	*Diplophos* spp.	1
96	*Gonostoma ebelingi*	1
96	*Gonostoma atlanticum*	1
96	*Cherublemma emmelas*	1
96	*Selar crumenophthalmus*	1
96	Anguilliformes	1
96	Carangidae	1
96	*Myctophum lychnobium*	1
96	Priacanthidae	1
96	*Trachipterus altivelis*	1
96	*Ceratoscopelus* spp.	1
96	*Paralabrax* spp.	1
96	*Parvilux ingens*	1
96	*Diplectrum* spp.	1
96	*Cryptopsaras couesii*	1
96	*Ceratias holboelli*	1
96	Serraninae	1
96	*Exocoetus* spp.	1
96	*Pontinus* spp.	1
96	*Zu cristatus*	1
96	*Halichoeres* spp.	1
96	*Scopelarchus guentheri*	1
96	*Synodus evermanni*	1
96	*Ruvettus pretiosus*	1
96	*Diplospinus multistriatus*	1
96	*Microdesmus* spp.	1
96	Myctophiformes	1
96	*Brama* spp.	1
96	*Kali* spp.	1
96	Sciaenidae	1
96	Pomacentridae	1
96	*Polydactylus opercularis*	1
96	*Mugil* spp.	1
96	*Lampanyctus tenuiformis*	1
96	*Nannobrachium ritteri*	1
96	*Polydactylus approximans*	1
96	*Psenes* spp.	1
96	*Hypsoblennius brevipinnis*	1
	Total	1058

Table 9. Pooled standardized numbers of fish larvae taken in bongo net tows on *McArthur* cruise 9910M4.

Rank	Taxon	Count
1	*Vinciguerria lucetia*	38103
2	*Diogenichthys laternatus*	24541
3	*Diaphus* spp.	4521
4	*Bregmaceros bathymaster*	1729
5	*Lampanyctus* spp.	1602
6	*Cubiceps pauciradiatus*	1290
7	*Bathylagus* spp.	1261
8	*Bregmaceros* spp.	1007
9	*Sternoptyx* spp.	1001
10	Eleotridae	835
11	*Lampanyctus parvicauda*	722
12	*Symbolophorus evermanni*	643
13	*Ceratoscopelus townsendi*	626
14	*Notolychnus valdiviae*	583
15	*Lestidium* spp.	571
16	*Triphoturus mexicanus*	568
17	*Hygophum proximum*	551
18	*Cyclothone* spp.	520
19	*Auxis* spp.	492
20	*Lestidiops neles*	453
21	*Scopelogadus bispinosus*	340
22	*Hygophum atratum*	338
23	*Scopelarchoides nicholsi*	320
24	*Idiacanthus* spp.	317
25	*Myctophum nitidulum*	291
26	*Caranx* spp.	270
27	*Opisthonema* spp.	261
28	*Bathophilus filifer*	261
29	*Myctophum aurolaternatum*	208
30	*Psenes sio*	204
31	Myctophidae	203
32	*Stemonosudis macrura*	194
33	*Diplophos proximus*	187
34	*Benthosema panamense*	172
35	*Melamphaes* spp.	156
36	*Howella pammelas*	151
37	*Cyclothone acclinidens*	150
38	*Gempylus serpens*	149
39	*Symphurus* spp.	145
40	Unidentified fish larvae	145
41	*Myctophum* spp.	143
42	*Howella* spp.	131
43	*Lampadena urophaos*	131
44	*Evermannella ahlstromi*	121
45	Disintegrated fish larvae	119
46	*Ceratoscopelus warmingii*	118
47	*Rosenblattichthys volucris*	109
48	*Lestidiops* spp.	101
49	*Chiasmodon niger*	97

Table 9. (cont.)

Rank	Taxon	Count
50	*Oxyporhamphus micropterus*	95
51	*Gonichthys tenuiculus*	92
52	*Cyclothone signata*	86
53	*Brama dussumieri*	80
54	*Chauliodus* spp.	71
55	*Nannobrachium idostigma*	71
56	*Polydactylus approximans*	68
57	*Bothus* spp.	67
58	*Argyropelecus sladeni*	66
59	*Bolinichthys longipes*	63
60	*Thunnus* spp.	62
61	*Myctophum asperum*	60
62	*Syacium ovale*	60
63	*Coryphaena equiselis*	56
64	*Notoscopelus resplendens*	56
65	*Selar crumenophthalmus*	54
66	*Myctophum lychnobium*	50
67	*Loweina rara*	49
68	*Macroramphosus gracilis*	46
69	*Oneirodes* spp.	46
70	*Bathylagus nigrigenys*	43
71	Gobiidae	42
72	Stomiiformes	40
73	Clupeidae	38
73	*Polydactylus opercularis*	38
75	*Katsuwonus pelamis*	37
76	*Cubiceps baxteri*	36
77	*Hygophum* spp.	32
78	*Cherublemma emmelas*	31
78	*Mugil* spp.	31
80	*Symbolophorus californiensis*	29
81	*Ceratoscopelus* spp.	25
82	*Protomyctophum crockeri*	25
83	*Diplophos taenia*	24
84	*Lampanyctus bristori*	23
85	Pomacentridae	23
86	*Microdesmus* spp.	23
87	*Nealotus tripes*	23
88	*Trachipterus fukuzakii*	23
89	*Coryphaena hippurus*	20
90	*Psenes arafurensis*	18
91	*Melanocetus* spp.	18
92	*Diplophos* spp.	18
93	Anthiinae	18
94	*Synchiropus atrilabiatus*	17
95	*Triphoturus nigrescens*	17
96	*Citharichthys platophrys*	17
97	*Ichthyococcus irregularis*	17
98	Melanostomiinae	16
99	*Eustomias* spp.	16
100	*Melamphaes lugubris*	16

Table 9. (cont.)

Rank	Taxon	Count
101	*Ceratias holboelli*	16
102	*Cheilopogon xenopterus*	16
103	*Diogenichthys atlanticus*	16
104	*Stomias* spp.	16
105	Paralichthyidae	15
106	*Nezumia* spp.	13
107	*Argyropelecus* spp.	13
108	*Gonostoma atlanticum*	13
109	*Scopelengys* spp.	13
110	*Stomias atriventer*	12
111	*Nansenia crassa*	11
112	*Paraconger californiensis*	11
113	*Danaphos oculatus*	10
114	*Avocettina bowersi*	9
115	*Paralabrax* spp.	9
116	Astronesthinae	9
117	Myctophiformes	9
118	*Pontinus* spp.	9
119	*Symphurus callopterus*	9
119	*Hypsoblennius brevipinnis*	9
119	*Ariosoma gilberti*	9
119	*Ophichthus zophochir*	9
119	*Synodus evermanni*	9
119	*Psenes* spp.	9
119	Priacanthidae	9
126	*Tetragonurus cuvieri*	8
127	*Zu cristatus*	8
128	*Cryptopsaras couesii*	8
129	*Nannobrachium ritteri*	8
129	*Parvilux ingens*	8
131	*Trachipterus altivelis*	8
132	*Myrophis vafer*	8
133	Sciaenidae	8
133	Balistidae	8
133	Serraninae	8
136	*Ruvettus pretiosus*	8
137	*Kali* spp.	7
138	Carangidae	7
139	*Brama* spp.	6
139	Anguilliformes	6
141	*Lampanyctus tenuiformes*	5
141	*Diplospinus multistriatus*	5
143	*Tactostoma macropus*	5
144	*Diplectrum*spp.	4
144	*Halichoeres* spp.	4
146	*Gonostoma ebelingi*	4
146	*Exocoetus* spp.	4
148	*Scopelarchus guentheri*	4
	Total	89671

Table 10. Standaridized numbers (number per 10m²) of fish larvae taken in bongo net tows on *McArthur* cruise 9910M4 listed by taxon, tow number, and region.

Anguilliformes

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
16	M4	030	6	1	6.42

Myrophis vafer

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
60	M4	127	4	1	7.71

Ophichthus zophochir

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
83	M4	170	1	1	8.54

Ariosoma gilberti

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
83	M4	170	1	1	8.54

Paraconger californiensis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
62	M4	130	1	1	10.53

Avocettina bowersi

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
66	M4	138	4	1	9.20

Clupeidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	5	38.39

Opisthonema spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	34	261.05

Nansenia crassa

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
37	M4	072	5	1	10.61

Bathylagus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	4	30.89
2	M4	003	2	1	7.24
7	M4	013	5	4	28.33
8	M4	015	5	14	103.04
9	M4		5	2	16.52
14	M4	026	6	1	8.84
15	M4	028	6	4	30.33
19	M4	036	6	5	31.78

Bathylagus spp. (cont)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
22	M4	042	7	3	22.26
28	M4	054	6	1	4.05
56	M4	119	4	8	59.92
57	M4	121	4	13	119.08
58	M4	123	4	12	105.03
59	M4	125	4	9	77.54
60	M4	127	4	1	7.71
62	M4	130	1	2	21.05
64	M4	134	4	3	27.57
65	M4	136	4	2	16.56
66	M4	138	4	16	147.27
67	M4	140	4	6	52.60
68	M4	142	4	7	56.84
69	M4	144	5	3	23.34
71	M4	148	5	3	25.74
72	M4	150	5	14	122.79
73	M4	152	5	2	14.54
77	M4	160	2	1	9.17
80	M4	166	4	4	36.73
89	M4	182	2	6	27.06
94	M4		2	1	4.45
96	M4	195	2	1	9.03
97	M4	197	2	1	4.63
98	M4	199	2	2	9.52

Bathylagus nigrigenys

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
18	M4	034	6	1	9.04
54	M4	115	3	2	17.18
56	M4	119	4	1	7.49
66	M4	138	4	1	9.20

Stomiiformes

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
9	M4		5	1	8.26
16	M4	030	6	1	6.42
56	M4	119	4	1	7.49
57	M4	121	4	2	18.32

Cyclothone spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	2	15.45
2	M4	003	2	10	72.44
3	M4	005	2	31	111.60
4	M4	007	2	4	20.00

Cyclothone spp. (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
5	M4	009	2	4	14.40
6	M4	011	2	3	24.09
9	M4		5	2	16.52
10	M4	019	5	4	29.18
12	M4	022	5	3	21.24
16	M4	030	6	1	6.42
17	M4	032	6	3	26.12
28	M4	054	6	8	32.40
37	M4	072	5	5	53.05
57	M4	121	4	1	9.16
72	M4	150	5	1	8.77
91	M4	186	2	7	29.19
93	M4	190	2	1	9.05
94	M4		2	3	13.35
95	M4	193	2	1	7.80

Cyclothone acclinidens

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
4	M4	007	2	9	45.00
5	M4	009	2	3	10.80
7	M4	013	5	1	7.08
12	M4	022	5	1	7.08
14	M4	026	6	1	8.84
15	M4	028	6	1	7.58
22	M4	042	7	1	7.42
27	M4	052	6	4	16.12
28	M4	054	6	2	8.10
92	M4	188	2	3	24.09
95	M4	193	2	1	7.80

Cyclothone signata

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
4	M4	007	2	2	10.00
5	M4	009	2	2	7.20
15	M4	028	6	1	7.58
19	M4	036	6	1	6.36
23	M4	044	7	1	8.96
57	M4	121	4	1	9.16
70	M4	146	5	1	9.57
93	M4	190	2	1	9.05
94	M4		2	4	17.80

Diplophos spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
18	M4	034	6	2	18.08

Diplophos proximus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
16	M4	030	6	1	6.42
19	M4	036	6	1	6.36
21	M4	040	7	1	8.90
23	M4	044	7	1	8.96
57	M4	121	4	1	9.16
62	M4	130	1	3	31.58
74	M4	154	5	3	13.26
75	M4	156	5	1	9.53
76	M4	158	2	4	37.94
77	M4	160	2	1	9.17
84	M4	172	1	2	17.32
86	M4	176	2	1	7.76
87	M4	178	2	3	12.39
92	M4	188	2	1	8.03

Diplophos taenia

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
5	M4	009	2	2	7.20
9	M4		5	2	16.52

Gonostoma atlanticum

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
19	M4	036	6	2	12.71

Gonostoma ebelingi

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
91	M4	186	2	1	4.17

Argyropelecus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
87	M4	178	2	1	4.13
93	M4	190	2	1	9.05

Argyropelecus sladeni

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
11	M4		5	4	20.92
14	M4	026	6	2	17.67
66	M4	138	4	1	9.20
94	M4		2	3	13.35
98	M4	199	2	1	4.76

Danaphos oculatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
70	M4	146	5	1	9.57

Sternoptyx spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
6	M4	011	2	1	8.03
9	M4		5	1	8.26
13	M4	024	6	1	8.07
15	M4	028	6	6	45.50
18	M4	034	6	3	27.12
19	M4	036	6	5	31.78
21	M4	040	7	2	17.80
22	M4	042	7	22	163.21
23	M4	044	7	5	44.82
27	M4	052	6	1	4.03
28	M4	054	6	15	60.75
56	M4	119	4	3	22.47
57	M4	121	4	4	36.64
64	M4	134	4	1	9.19
65	M4	136	4	4	33.12
66	M4	138	4	29	266.92
67	M4	140	4	1	8.77
69	M4	144	5	6	46.68
70	M4	146	5	2	19.14
71	M4	148	5	11	94.38
72	M4	150	5	5	43.85

Ichthyococcus irregularis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	1	7.72
23	M4	044	7	1	8.96

Vinciguerria lucetia

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	17	131.30
2	M4	003	2	237	1716.7
3	M4	005	2	855	3078.0
4	M4	007	2	106	530.00
5	M4	009	2	35	126.00
6	M4	011	2	22	176.67
7	M4	013	5	109	772.00
8	M4	015	5	43	316.48
9	M4		5	217	1792.4
10	M4	019	5	130	948.36
11	M4		5	85	444.55
12	M4	022	5	127	899.28
13	M4	024	6	55	444.06
14	M4	026	6	1	8.84
15	M4	028	6	35	265.40
16	M4	030	6	291	1867.2
17	M4	032	6	579	5040.9
18	M4	034	6	138	1247.6
19	M4	036	6	6	38.14

Vinciguerria lucetia (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
21	M4	040	7	118	1050.4
22	M4	042	7	7	51.93
23	M4	044	7	37	331.67
27	M4	052	6	11	44.33
28	M4	054	6	40	162.00
35	M4	068	5	23	261.09
36	M4	070	5	29	274.02
37	M4	072	5	16	169.76
54	M4	115	3	12	103.06
56	M4	119	4	128	958.76
57	M4	121	4	199	1822.8
58	M4	123	4	14	122.54
59	M4	125	4	30	258.47
60	M4	127	4	27	208.24
61	M4	129	1	5	38.39
62	M4	130	1	21	221.05
63	M4	132	4	42	381.89
64	M4	134	4	24	220.58
65	M4	136	4	25	206.99
66	M4	138	4	63	579.87
67	M4	140	4	16	140.27
68	M4	142	4	29	235.48
69	M4	144	5	12	93.36
70	M4	146	5	11	105.25
71	M4	148	5	6	51.48
72	M4	150	5	119	1043.6
73	M4	152	5	46	334.38
74	M4	154	5	80	353.60
75	M4	156	5	35	333.64
76	M4	158	2	79	749.31
77	M4	160	2	62	568.55
78	M4	162	4	36	304.83
79	M4	164	4	36	158.40
80	M4	166	4	98	900.00
81	M4	168	4	57	478.49
83	M4	170	1	26	222.14
84	M4	172	1	49	424.42
85	M4	174	2	41	356.32
86	M4	176	2	18	139.73
87	M4	178	2	176	726.88
89	M4	182	2	345	1555.9
90	M4	184	2	33	147.84
91	M4	186	2	21	87.57
92	M4	188	2	34	272.98
93	M4	190	2	44	398.18
94	M4		2	57	253.65
95	M4	193	2	22	171.53
96	M4	195	2	1	9.03
97	M4	197	2	17	78.71

Vinciguerria lucetia (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
98	M4	199	2	20	95.20

Chauliodus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
10	M4	019	5	1	7.30
13	M4	024	6	4	32.30
16	M4	030	6	1	6.42
21	M4	040	7	1	8.90
23	M4	044	7	1	8.96
56	M4	119	4	1	7.49

Stomias spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
16	M4	030	6	1	6.42
57	M4	121	4	1	9.16

Stomias atriventer

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
92	M4	188	2	1	8.03
94	M4		2	1	4.45

Astronesthinae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
23	M4	044	7	1	8.96

Melanostomiinae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
2	M4	003	2	1	7.24
66	M4	138	4	1	9.20

Bathophilus filifer

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
15	M4	028	6	6	45.50
18	M4	034	6	1	9.04
19	M4	036	6	1	6.36
22	M4	042	7	1	7.42
56	M4	119	4	1	7.49
58	M4	123	4	1	8.75
60	M4	127	4	1	7.71
62	M4	130	1	1	10.53
63	M4	132	4	2	18.19
65	M4	136	4	1	8.28
68	M4	142	4	2	16.24
70	M4	146	5	3	28.70
71	M4	148	5	1	8.58
72	M4	150	5	1	8.77
74	M4	154	5	1	4.42
75	M4	156	5	1	9.53

Bathophilus filifer (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
76	M4	158	2	3	28.45
77	M4	160	2	1	9.17
80	M4	166	4	1	9.18
83	M4	170	1	1	8.54

Eustomias spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
27	M4	052	6	1	4.03
28	M4	054	6	1	4.05
91	M4	186	2	2	8.34

Tactostoma macropus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
97	M4	197	2	1	4.63

Idiacanthus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
3	M4	005	2	1	3.60
5	M4	009	2	5	18.00
7	M4	013	5	2	14.17
8	M4	015	5	7	51.52
16	M4	030	6	1	6.42
17	M4	032	6	1	8.71
28	M4	054	6	6	24.30
62	M4	130	1	1	10.53
63	M4	132	4	2	18.19
67	M4	140	4	1	8.77
73	M4	152	5	3	21.81
75	M4	156	5	7	66.73
79	M4	164	4	1	4.40
80	M4	166	4	2	18.37
87	M4	178	2	1	4.13
89	M4	182	2	2	9.02
91	M4	186	2	3	12.51
92	M4	188	2	1	8.03
95	M4	193	2	1	7.80

Rosenblattichthys volucris

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
9	M4		5	6	49.56
10	M4	019	5	2	14.59
11	M4		5	1	5.23
16	M4	030	6	2	12.83
18	M4	034	6	1	9.04
27	M4	052	6	1	4.03
28	M4	054	6	1	4.05
36	M4	070	5	1	9.45

Scopelarchoides nicholsi

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
6	M4	011	2	1	8.03
7	M4	013	5	11	77.91
8	M4	015	5	3	22.08
23	M4	044	7	1	8.96
58	M4	123	4	1	8.75
60	M4	127	4	1	7.71
62	M4	130	1	1	10.53
64	M4	134	4	1	9.19
67	M4	140	4	1	8.77
72	M4	150	5	4	35.08
73	M4	152	5	2	14.54
74	M4	154	5	1	4.42
75	M4	156	5	3	28.60
76	M4	158	2	1	9.48
77	M4	160	2	2	18.34
79	M4	164	4	1	4.40
80	M4	166	4	2	18.37
86	M4	176	2	1	7.76
89	M4	182	2	1	4.51
90	M4	184	2	1	4.48
95	M4	193	2	1	7.80

Scopelarchus guentheri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
5	M4	009	2	1	3.60

Synodus evermanni

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
83	M4	170	1	1	8.54

Lestidiops spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
16	M4	030	6	1	6.42
36	M4	070	5	1	9.45
37	M4	072	5	8	84.88

Lestidiops neles

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
8	M4	015	5	2	14.72
56	M4	119	4	1	7.49
57	M4	121	4	1	9.16
58	M4	123	4	1	8.75
59	M4	125	4	1	8.62
60	M4	127	4	8	61.70
61	M4	129	1	1	7.68
62	M4	130	1	7	73.68
63	M4	132	4	5	45.46
64	M4	134	4	1	9.19

Lestidiops neles (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
73	M4	152	5	1	7.27
76	M4	158	2	3	28.45
78	M4	162	4	2	16.94
79	M4	164	4	4	17.60
81	M4	168	4	9	75.55
83	M4	170	1	1	8.54
84	M4	172	1	4	34.65
85	M4	174	2	2	17.38

Lestidium spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
6	M4	011	2	2	16.06
8	M4	015	5	5	36.80
9	M4		5	4	33.04
10	M4	019	5	1	7.30
11	M4		5	1	5.23
15	M4	028	6	8	60.66
16	M4	030	6	21	134.75
19	M4	036	6	3	19.07
28	M4	054	6	1	4.05
65	M4	136	4	3	24.84
66	M4	138	4	3	27.61
67	M4	140	4	3	26.30
69	M4	144	5	2	15.56
70	M4	146	5	13	124.38
71	M4	148	5	3	25.74
75	M4	156	5	1	9.53

Stemonosudis macrura

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
4	M4	007	2	1	5.00
8	M4	015	5	2	14.72
9	M4		5	3	24.78
10	M4	019	5	3	21.89
11	M4		5	4	20.92
12	M4	022	5	2	14.16
15	M4	028	6	2	15.17
17	M4	032	6	3	26.12
21	M4	040	7	3	26.71
28	M4	054	6	1	4.05
69	M4	144	5	1	7.78
87	M4	178	2	1	4.13
89	M4	182	2	1	4.51
91	M4	186	2	1	4.17

Evermannella ahlstromi

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
6	M4	011	2	3	24.09

Evermannella ahlstromi (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
10	M4	019	5	2	14.59
12	M4	022	5	1	7.08
15	M4	028	6	1	7.58
16	M4	030	6	3	19.25
18	M4	034	6	2	18.08
21	M4	040	7	1	8.90
22	M4	042	7	1	7.42
70	M4	146	5	1	9.57
91	M4	186	2	1	4.17

Myctophiformes

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
67	M4	140	4	1	8.77

Scopelengys spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
10	M4	019	5	1	7.30
11	M4		5	1	5.23

Myctophidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
9	M4		5	3	24.78
10	M4	019	5	1	7.30
17	M4	032	6	3	26.12
21	M4	040	7	1	8.90
28	M4	054	6	4	16.20
35	M4	068	5	1	11.35
56	M4	119	4	2	14.98
67	M4	140	4	1	8.77
70	M4	146	5	1	9.57
75	M4	156	5	1	9.53
89	M4	182	2	4	18.04
90	M4	184	2	1	4.48
91	M4	186	2	5	20.85
92	M4	188	2	1	8.03
93	M4	190	2	1	9.05
98	M4	199	2	1	4.76

Bolinichthys longipes

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
5	M4	009	2	1	3.60
6	M4	011	2	1	8.03
16	M4	030	6	2	12.83
18	M4	034	6	2	18.08
35	M4	068	5	1	11.35
89	M4	182	2	1	4.51
91	M4	186	2	1	4.17

Ceratoscopelus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
87	M4	178	2	6	24.78

Ceratoscopelus townsendi

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
2	M4	003	2	7	50.71
3	M4	005	2	61	219.60
4	M4	007	2	51	255.00
5	M4	009	2	24	86.40
97	M4	197	2	1	4.63
98	M4	199	2	2	9.52

Ceratoscopelus warmingii

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
21	M4	040	7	4	35.61
28	M4	054	6	1	4.05
74	M4	154	5	2	8.84
91	M4	186	2	5	20.85
94	M4		2	4	17.80
95	M4	193	2	4	31.19

Diaphus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
3	M4	005	2	10	36.00
4	M4	007	2	4	20.00
6	M4	011	2	1	8.03
7	M4	013	5	15	106.24
8	M4	015	5	16	117.76
9	M4		5	10	82.60
10	M4	019	5	4	29.18
13	M4	024	6	6	48.44
15	M4	028	6	11	83.41
16	M4	030	6	5	32.08
17	M4	032	6	2	17.41
18	M4	034	6	4	36.16
19	M4	036	6	2	12.71
21	M4	040	7	6	53.41
23	M4	044	7	1	8.96
27	M4	052	6	2	8.06
28	M4	054	6	2	8.10
35	M4	068	5	4	45.41
37	M4	072	5	1	10.61
56	M4	119	4	8	59.92
57	M4	121	4	3	27.48
58	M4	123	4	4	35.01
59	M4	125	4	1	8.62
60	M4	127	4	18	138.83
61	M4	129	1	9	69.10
62	M4	130	1	29	305.26

Diaphus spp. (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
63	M4	132	4	31	281.87
64	M4	134	4	18	165.44
65	M4	136	4	7	57.96
66	M4	138	4	15	138.06
67	M4	140	4	2	17.53
68	M4	142	4	6	48.72
70	M4	146	5	11	105.25
71	M4	148	5	2	17.16
72	M4	150	5	5	43.85
73	M4	152	5	2	14.54
74	M4	154	5	11	48.62
75	M4	156	5	8	76.26
76	M4	158	2	28	265.58
77	M4	160	2	16	146.72
78	M4	162	4	41	347.17
79	M4	164	4	22	96.80
80	M4	166	4	17	156.12
81	M4	168	4	29	243.44
83	M4	170	1	5	42.72
84	M4	172	1	41	355.12
85	M4	174	2	2	17.38
86	M4	176	2	7	54.34
87	M4	178	2	50	206.50
89	M4	182	2	29	130.79
90	M4	184	2	2	8.96
92	M4	188	2	2	16.06
93	M4	190	2	1	9.05

Lampadena urophaos

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	3	23.17
3	M4	005	2	5	18.00
4	M4	007	2	5	25.00
9	M4		5	2	16.52
10	M4	019	5	1	7.30
13	M4	024	6	2	16.15
92	M4	188	2	1	8.03
94	M4		2	2	8.90
95	M4	193	2	1	7.80

Lampanyctus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
2	M4	003	2	1	7.24
3	M4	005	2	7	25.20
5	M4	009	2	2	7.20
6	M4	011	2	1	8.03
8	M4	015	5	1	7.36
9	M4		5	5	41.30

Lampanyctus spp. (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
10	M4	019	5	2	14.59
11	M4		5	1	5.23
13	M4	024	6	5	40.37
14	M4	026	6	2	17.67
15	M4	028	6	50	379.14
17	M4	032	6	3	26.12
18	M4	034	6	2	18.08
19	M4	036	6	6	38.14
21	M4	040	7	3	26.71
22	M4	042	7	3	22.26
23	M4	044	7	3	26.89
27	M4	052	6	4	16.12
28	M4	054	6	11	44.55
36	M4	070	5	8	75.59
37	M4	072	5	6	63.66
56	M4	119	4	15	112.36
57	M4	121	4	22	201.52
65	M4	136	4	17	140.76
66	M4	138	4	4	36.82
67	M4	140	4	1	8.77
68	M4	142	4	3	24.36
69	M4	144	5	5	38.90
70	M4	146	5	3	28.70
71	M4	148	5	2	17.16
72	M4	150	5	2	17.54
74	M4	154	5	3	13.26
80	M4	166	4	1	9.18
91	M4	186	2	5	20.85
92	M4	188	2	2	16.06
94	M4		2	1	4.45

Lampanyctus parvicauda

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
8	M4	015	5	1	7.36
18	M4	034	6	3	27.12
19	M4	036	6	3	19.07
23	M4	044	7	1	8.96
27	M4	052	6	1	4.03
28	M4	054	6	1	4.05
54	M4	115	3	1	8.59
56	M4	119	4	2	14.98
57	M4	121	4	12	109.92
58	M4	123	4	5	43.76
59	M4	125	4	5	43.08
60	M4	127	4	3	23.14
63	M4	132	4	4	36.37
64	M4	134	4	4	36.76
66	M4	138	4	2	18.41

Lampanyctus parvicauda (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
67	M4	140	4	2	17.53
68	M4	142	4	6	48.72
69	M4	144	5	2	15.56
73	M4	152	5	2	14.54
75	M4	156	5	1	9.53
76	M4	158	2	5	47.42
78	M4	162	4	3	25.40
80	M4	166	4	7	64.29
81	M4	168	4	1	8.39
83	M4	170	1	1	8.54
84	M4	172	1	3	25.98
85	M4	174	2	2	17.38
87	M4	178	2	2	8.26
89	M4	182	2	1	4.51

Lampanyctus tenuiformes

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
4	M4	007	2	1	5.00

Nannobrachium bristori

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
4	M4	007	2	1	5.00
57	M4	121	4	2	18.32

Nannobrachium idostigma

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
93	M4	190	2	5	45.25
94	M4		2	4	17.80
95	M4	193	2	1	7.80

Nannobrachium ritteri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
6	M4	011	2	1	8.03

Notolychnus valdiviae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
9	M4		5	17	140.42
10	M4	019	5	24	175.08
12	M4	022	5	4	28.32
13	M4	024	6	9	72.66
15	M4	028	6	4	30.33
16	M4	030	6	1	6.42
19	M4	036	6	5	31.78
21	M4	040	7	1	8.90
22	M4	042	7	3	22.26
23	M4	044	7	1	8.96
28	M4	054	6	1	4.05
37	M4	072	5	1	10.61

Notolychnus valdiviae (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
56	M4	119	4	2	14.98
66	M4	138	4	1	9.20
70	M4	146	5	2	19.14

Notoscopelus resplendens

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
5	M4	009	2	1	3.60
9	M4		5	4	33.04
37	M4	072	5	1	10.61
91	M4	186	2	1	4.17
98	M4	199	2	1	4.76

Parvilux ingens

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
6	M4	011	2	1	8.03

Triphoturus mexicanus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	8	61.79
2	M4	003	2	66	478.08
70	M4	146	5	2	19.14
96	M4	195	2	1	9.03

Triphoturus nigrescens

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
4	M4	007	2	2	10.00
10	M4	019	5	1	7.30

Benthosema panamense

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	10	76.78
62	M4	130	1	3	31.58
63	M4	132	4	7	63.65

Diogenichthys atlanticus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	1	7.72
9	M4		5	1	8.26

Diogenichthys laternatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
3	M4	005	2	2	7.20
5	M4	009	2	5	18.00
6	M4	011	2	36	289.10
7	M4	013	5	10	70.83
8	M4	015	5	15	110.40
9	M4		5	17	140.42

Diogenichthys laternatus (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
10	M4	019	5	30	218.85
11	M4		5	7	36.61
12	M4	022	5	54	382.37
13	M4	024	6	31	250.29
14	M4	026	6	1	8.84
15	M4	028	6	74	561.13
16	M4	030	6	14	89.83
17	M4	032	6	19	165.42
18	M4	034	6	1	9.04
19	M4	036	6	104	661.05
22	M4	042	7	27	200.30
23	M4	044	7	25	224.10
27	M4	052	6	3	12.09
28	M4	054	6	65	263.25
35	M4	068	5	1	11.35
36	M4	070	5	25	236.22
37	M4	072	5	26	275.87
54	M4	115	3	4	34.35
56	M4	119	4	677	5070.9
57	M4	121	4	390	3572.4
58	M4	123	4	60	525.15
59	M4	125	4	53	456.63
60	M4	127	4	4	30.85
62	M4	130	1	10	105.26
63	M4	132	4	10	90.93
64	M4	134	4	7	64.34
65	M4	136	4	246	2036.8
66	M4	138	4	387	3562.0
67	M4	140	4	150	1315.0
68	M4	142	4	27	219.24
69	M4	144	5	24	186.72
70	M4	146	5	41	392.28
71	M4	148	5	39	334.62
72	M4	150	5	34	298.20
73	M4	152	5	21	152.65
74	M4	154	5	5	22.10
75	M4	156	5	8	76.26
76	M4	158	2	3	28.45
77	M4	160	2	7	64.19
78	M4	162	4	2	16.94
80	M4	166	4	6	55.10
81	M4	168	4	6	50.37
83	M4	170	1	14	119.61
84	M4	172	1	6	51.97
85	M4	174	2	36	312.87
86	M4	176	2	5	38.81
87	M4	178	2	9	37.17
89	M4	182	2	48	216.48

Diogenichthys laternatus (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
90	M4	184	2	2	8.96
91	M4	186	2	58	241.86
92	M4	188	2	22	176.63
93	M4	190	2	12	108.60
94	M4		2	25	111.25
95	M4	193	2	5	38.98
96	M4	195	2	5	45.15
97	M4	197	2	3	13.89
98	M4	199	2	3	14.28

Gonichthys tenuiculus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
23	M4	044	7	1	8.96
56	M4	119	4	4	29.96
57	M4	121	4	3	27.48
71	M4	148	5	1	8.58
89	M4	182	2	1	4.51
92	M4	188	2	1	8.03
94	M4		2	1	4.45

Hygophum spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
2	M4	003	2	1	7.24
3	M4	005	2	7	25.20

Hygophum atratum

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
4	M4	007	2	1	5.00
5	M4	009	2	1	3.60
6	M4	011	2	1	8.03
37	M4	072	5	1	10.61
74	M4	154	5	6	26.52
83	M4	170	1	2	17.09
87	M4	178	2	5	20.65
89	M4	182	2	26	117.26
90	M4	184	2	8	35.84
91	M4	186	2	2	8.34
92	M4	188	2	5	40.14
93	M4	190	2	4	36.20
94	M4		2	2	8.90

Hygophum proximum

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
6	M4	011	2	1	8.03
7	M4	013	5	3	21.25
9	M4		5	4	33.04
12	M4	022	5	2	14.16
13	M4	024	6	2	16.15

Hygophum proximum (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
15	M4	028	6	4	30.33
16	M4	030	6	5	32.08
19	M4	036	6	4	25.43
21	M4	040	7	3	26.71
22	M4	042	7	4	29.67
23	M4	044	7	2	17.93
27	M4	052	6	3	12.09
28	M4	054	6	5	20.25
37	M4	072	5	18	190.98
70	M4	146	5	2	19.14
91	M4	186	2	13	54.21

Loweina rara

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
15	M4	028	6	1	7.58
35	M4	068	5	1	11.35
90	M4	184	2	1	4.48
91	M4	186	2	2	8.34
92	M4	188	2	1	8.03
93	M4	190	2	1	9.05

Myctophum spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
10	M4	019	5	5	36.48
12	M4	022	5	5	35.40
13	M4	024	6	2	16.15
16	M4	030	6	3	19.25
17	M4	032	6	1	8.71
18	M4	034	6	3	27.12

Myctophum asperum

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
9	M4		5	1	8.26
10	M4	019	5	2	14.59
13	M4	024	6	1	8.07
70	M4	146	5	3	28.70

Myctophum aurolaternatum

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
7	M4	013	5	1	7.08
8	M4	015	5	1	7.36
11	M4		5	1	5.23
15	M4	028	6	1	7.58
16	M4	030	6	1	6.42
19	M4	036	6	1	6.36
22	M4	042	7	2	14.84
28	M4	054	6	1	4.05
37	M4	072	5	1	10.61

Myctophum aurolaternatum (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
63	M4	132	4	3	27.28
70	M4	146	5	4	38.27
72	M4	150	5	1	8.77
78	M4	162	4	3	25.40
79	M4	164	4	1	4.40
81	M4	168	4	2	16.79
83	M4	170	1	1	8.54
84	M4	172	1	1	8.66

Myctophum lychnobium

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
9	M4		5	6	49.56

Myctophum nitidulum

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
3	M4	005	2	1	3.60
9	M4		5	1	8.26
10	M4	019	5	1	7.30
12	M4	022	5	1	7.08
19	M4	036	6	1	6.36
28	M4	054	6	4	16.20
35	M4	068	5	1	11.35
36	M4	070	5	12	113.39
37	M4	072	5	4	42.44
56	M4	119	4	1	7.49
70	M4	146	5	3	28.70
74	M4	154	5	2	8.84
94	M4		2	1	4.45
95	M4	193	2	2	15.59
98	M4	199	2	2	9.52

Protomyctophum crockeri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	1	7.72
93	M4	190	2	1	9.05
95	M4	193	2	1	7.80

Symbolophorus californiensis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
2	M4	003	2	2	14.49
12	M4	022	5	2	14.16

Symbolophorus evermanni

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
6	M4	011	2	1	8.03
7	M4	013	5	1	7.08
10	M4	019	5	6	43.77
13	M4	024	6	7	56.52

Symbolophorus evermanni (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
15	M4	028	6	7	53.08
16	M4	030	6	11	70.58
19	M4	036	6	6	38.14
22	M4	042	7	2	14.84
23	M4	044	7	2	17.93
27	M4	052	6	5	20.15
28	M4	054	6	42	170.10
68	M4	142	4	1	8.12
70	M4	146	5	2	19.14
71	M4	148	5	13	111.54
91	M4	186	2	1	4.17

Trachipterus altivelis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	1	7.72

Trachipterus fukuzakii

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
11	M4		5	1	5.23
18	M4	034	6	1	9.04
81	M4	168	4	1	8.39

Zu cristatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
68	M4	142	4	1	8.12

Bregmaceros spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
5	M4	009	2	8	28.80
6	M4	011	2	2	16.06
7	M4	013	5	2	14.17
8	M4	015	5	4	29.44
9	M4		5	13	107.38
10	M4	019	5	12	87.54
11	M4		5	2	10.46
12	M4	022	5	15	106.21
13	M4	024	6	19	153.40
15	M4	028	6	2	15.17
16	M4	030	6	3	19.25
17	M4	032	6	1	8.71
19	M4	036	6	1	6.36
21	M4	040	7	1	8.90
27	M4	052	6	4	16.12
28	M4	054	6	13	52.65
35	M4	068	5	1	11.35
36	M4	070	5	1	9.45
56	M4	119	4	1	7.49

Bregmaceros spp. (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
65	M4	136	4	2	16.56
67	M4	140	4	1	8.77
68	M4	142	4	2	16.24
69	M4	144	5	3	23.34
70	M4	146	5	6	57.41
71	M4	148	5	10	85.80
72	M4	150	5	1	8.77
78	M4	162	4	1	8.47
84	M4	172	1	1	8.66
85	M4	174	2	1	8.69
87	M4	178	2	1	4.13
89	M4	182	2	6	27.06
91	M4	186	2	4	16.68
92	M4	188	2	1	8.03

Bregmaceros bathymaster

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	223	1712.1
83	M4	170	1	2	17.09

Nezumia spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
67	M4	140	4	1	8.77
89	M4	182	2	1	4.51

Cherublemma emmelas

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	4	30.71

Melanocetus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
23	M4	044	7	1	8.96
57	M4	121	4	1	9.16

Oneirodes spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
10	M4	019	5	1	7.30
11	M4		5	1	5.23
15	M4	028	6	1	7.58
57	M4	121	4	1	9.16
69	M4	144	5	1	7.78
78	M4	162	4	1	8.47

Ceratias holboelli

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
13	M4	024	6	2	16.15

Cryptopsaras couesii

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
13	M4	024	6	1	8.07

Cheilopogon xenopterus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
67	M4	140	4	1	8.77
73	M4	152	5	1	7.27

Exocoetus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
91	M4	186	2	1	4.17

Oxyporhamphus micropterus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
22	M4	042	7	1	7.42
63	M4	132	4	1	9.09
64	M4	134	4	1	9.19
68	M4	142	4	1	8.12
73	M4	152	5	1	7.27
74	M4	154	5	2	8.84
75	M4	156	5	3	28.60
78	M4	162	4	1	8.47
81	M4	168	4	1	8.39

Melamphaes spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
8	M4	015	5	1	7.36
16	M4	030	6	2	12.83
19	M4	036	6	1	6.36
22	M4	042	7	1	7.42
28	M4	054	6	2	8.10
56	M4	119	4	1	7.49
57	M4	121	4	1	9.16
58	M4	123	4	3	26.26
59	M4	125	4	1	8.62
61	M4	129	1	1	7.68
65	M4	136	4	1	8.28
67	M4	140	4	2	17.53
81	M4	168	4	1	8.39
85	M4	174	2	1	8.69
91	M4	186	2	1	4.17
92	M4	188	2	1	8.03

Melamphaes lugubris

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
2	M4	003	2	1	7.24
96	M4	195	2	1	9.03

Scopelogadus bispinosus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
8	M4	015	5	1	7.36
19	M4	036	6	1	6.36
27	M4	052	6	2	8.06
28	M4	054	6	1	4.05
54	M4	115	3	1	8.59
56	M4	119	4	2	14.98
57	M4	121	4	1	9.16
58	M4	123	4	4	35.01
68	M4	142	4	3	24.36
70	M4	146	5	1	9.57
71	M4	148	5	3	25.74
72	M4	150	5	1	8.77
73	M4	152	5	4	29.08
75	M4	156	5	1	9.53
76	M4	158	2	1	9.48
77	M4	160	2	1	9.17
78	M4	162	4	1	8.47
80	M4	166	4	2	18.37
83	M4	170	1	1	8.54
85	M4	174	2	1	8.69
86	M4	176	2	1	7.76
89	M4	182	2	5	22.55
91	M4	186	2	7	29.19
94	M4		2	1	4.45
95	M4	193	2	1	7.80
97	M4	197	2	1	4.63

Macroramphosus gracilis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
94	M4		2	1	4.45
96	M4	195	2	3	27.09
98	M4	199	2	3	14.28

Pontinus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
59	M4	125	4	1	8.62

Howella spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
3	M4	005	2	2	7.20
10	M4	019	5	12	87.54
11	M4		5	4	20.92
19	M4	036	6	1	6.36
21	M4	040	7	1	8.90

Howella pammelas

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
9	M4		5	2	16.52

Howella pammelas (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
12	M4	022	5	1	7.08
13	M4	024	6	7	56.52
15	M4	028	6	1	7.58
16	M4	030	6	2	12.83
17	M4	032	6	2	17.41
69	M4	144	5	1	7.78
71	M4	148	5	3	25.74

Serraninae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	1	7.68

Diplectrum spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
90	M4	184	2	1	4.48

Paralabrax spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
96	M4	195	2	1	9.03

Anthiinae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
74	M4	154	5	2	8.84
89	M4	182	2	2	9.02

Priacanthidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
83	M4	170	1	1	8.54

Carangidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
12	M4	022	5	1	7.08

Caranx spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
7	M4	013	5	3	21.25
23	M4	044	7	26	233.07
61	M4	129	1	2	15.36

Selar crumenophthalmus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	7	53.75

Coryphaena equiselis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
18	M4	034	6	1	9.04

Coryphaena equiselis (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
21	M4	040	7	1	8.90
23	M4	044	7	1	8.96
35	M4	068	5	1	11.35
76	M4	158	2	1	9.48
78	M4	162	4	1	8.47

Coryphaena hippurus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
5	M4	009	2	1	3.60
64	M4	134	4	1	9.19
73	M4	152	5	1	7.27

Brama spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
16	M4	030	6	1	6.42

Brama dussumieri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
12	M4	022	5	2	14.16
13	M4	024	6	1	8.07
15	M4	028	6	1	7.58
19	M4	036	6	1	6.36
21	M4	040	7	2	17.80
66	M4	138	4	1	9.20
69	M4	144	5	1	7.78
71	M4	148	5	1	8.58

Sciaenidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	1	7.68

Polydactylus approximans

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
83	M4	170	1	8	68.35

Polydactylus opercularis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	5	38.39

Mugil spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	4	30.71

Pomacentridae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	3	23.17

Halichoeres spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
90	M4	184	2	1	4.48

Chiasmodon niger

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
2	M4	003	2	1	7.24
10	M4	019	5	1	7.30
11	M4		5	1	5.23
12	M4	022	5	1	7.08
15	M4	028	6	1	7.58
27	M4	052	6	1	4.03
28	M4	054	6	3	12.15
56	M4	119	4	1	7.49
68	M4	142	4	1	8.12
71	M4	148	5	1	8.58
89	M4	182	2	3	13.53
91	M4	186	2	1	4.17
98	M4	199	2	1	4.76

Kali spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
7	M4	013	5	1	7.08

Hypsoblennius brevipinnis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
83	M4	170	1	1	8.54

Synchiropus atrilabiatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
65	M4	136	4	1	8.28
66	M4	138	4	1	9.20

Eleotridae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
54	M4	115	3	2	17.18
58	M4	123	4	3	26.26
59	M4	125	4	1	8.62
60	M4	127	4	24	185.10
61	M4	129	1	71	545.13
62	M4	130	1	1	10.53
81	M4	168	4	4	33.58
83	M4	170	1	1	8.54

Gobiidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
60	M4	127	4	1	7.71
61	M4	129	1	2	15.36
62	M4	130	1	1	10.53
84	M4	172	1	1	8.66

Microdesmus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	3	23.03

Diplospinus multistriatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
4	M4	007	2	1	5.00

Gempylus serpens

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
5	M4	009	2	1	3.60
9	M4		5	1	8.26
15	M4	028	6	1	7.58
19	M4	036	6	1	6.36
21	M4	040	7	1	8.90
23	M4	044	7	1	8.96
28	M4	054	6	1	4.05
66	M4	138	4	1	9.20
69	M4	144	5	2	15.56
72	M4	150	5	3	26.31
76	M4	158	2	2	18.97
80	M4	166	4	3	27.55
91	M4	186	2	1	4.17

Nealotus tripes

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
7	M4	013	5	1	7.08
28	M4	054	6	2	8.10
56	M4	119	4	1	7.49

Ruvettus pretiosus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
15	M4	028	6	1	7.58

Auxis spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
7	M4	013	5	1	7.08
10	M4	019	5	2	14.59
19	M4	036	6	1	6.36
23	M4	044	7	2	17.93
28	M4	054	6	1	4.05
57	M4	121	4	1	9.16
58	M4	123	4	1	8.75
59	M4	125	4	2	17.23
60	M4	127	4	6	46.28
61	M4	129	1	3	23.03
63	M4	132	4	3	27.28
65	M4	136	4	1	8.28
70	M4	146	5	1	9.57
73	M4	152	5	5	36.35

Auxis spp. (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
75	M4	156	5	2	19.07
78	M4	162	4	1	8.47
79	M4	164	4	3	13.20
80	M4	166	4	1	9.18
83	M4	170	1	17	145.24
84	M4	172	1	7	60.63

Katsuwonus pelamis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
13	M4	024	6	3	24.22
16	M4	030	6	1	6.42
19	M4	036	6	1	6.36

Thunnus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
12	M4	022	5	1	7.08
13	M4	024	6	2	16.15
21	M4	040	7	2	17.80
79	M4	164	4	1	4.40
87	M4	178	2	2	8.26
89	M4	182	2	1	4.51
91	M4	186	2	1	4.17

Cubiceps baxteri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
91	M4	186	2	1	4.17
92	M4	188	2	4	32.11

Cubiceps pauciradiatus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
7	M4	013	5	4	28.33
8	M4	015	5	3	22.08
10	M4	019	5	1	7.30
15	M4	028	6	2	15.17
18	M4	034	6	2	18.08
19	M4	036	6	1	6.36
22	M4	042	7	8	59.35
23	M4	044	7	11	98.60
56	M4	119	4	2	14.98
57	M4	121	4	5	45.80
58	M4	123	4	5	43.76
60	M4	127	4	1	7.71
62	M4	130	1	1	10.53
63	M4	132	4	12	109.11
64	M4	134	4	4	36.76
66	M4	138	4	1	9.20
68	M4	142	4	8	64.96
72	M4	150	5	3	26.31

Cubiceps pauciradiatus (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
73	M4	152	5	3	21.81
74	M4	154	5	6	26.52
75	M4	156	5	5	47.66
76	M4	158	2	10	94.85
77	M4	160	2	8	73.36
78	M4	162	4	6	50.81
79	M4	164	4	6	26.40
80	M4	166	4	9	82.65
81	M4	168	4	4	33.58
84	M4	172	1	7	60.63
85	M4	174	2	4	34.76
86	M4	176	2	3	23.29
87	M4	178	2	14	57.82
89	M4	182	2	6	27.06
90	M4	184	2	1	4.48

Psenes spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
83	M4	170	1	1	8.54

Psenes arafurensis

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
21	M4	040	7	1	8.90
70	M4	146	5	1	9.57

Psenes sio

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
59	M4	125	4	10	86.16
60	M4	127	4	5	38.56
61	M4	129	1	3	23.03
62	M4	130	1	1	10.53
64	M4	134	4	1	9.19
73	M4	152	5	1	7.27
79	M4	164	4	1	4.40
81	M4	168	4	3	25.18

Tetragonurus cuvieri

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
5	M4	009	2	1	3.60
97	M4	197	2	1	4.63

Paralichthyidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	2	15.36

Citharichthys platophrys

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
83	M4	170	1	2	17.09

Syacium ovale

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
57	M4	121	4	2	18.32
59	M4	125	4	2	17.23
60	M4	127	4	2	15.43
83	M4	170	1	1	8.54

Bothus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
54	M4	115	3	1	8.59
56	M4	119	4	3	22.47
57	M4	121	4	3	27.48
59	M4	125	4	1	8.62

Symphurus spp.

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
54	M4	115	3	2	17.18
81	M4	168	4	1	8.39
83	M4	170	1	14	119.61

Symphurus callopterus

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
83	M4	170	1	1	8.54

Balistidae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
61	M4	129	1	1	7.68

Disintegrated fish larvae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
1	M4	001	2	1	7.72

Disintegrated fish larvae (cont.)

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
2	M4	003	2	2	14.49
5	M4	009	2	1	3.60
12	M4	022	5	2	14.16
17	M4	032	6	1	8.71
63	M4	132	4	1	9.09
65	M4	136	4	2	16.56
70	M4	146	5	1	9.57
71	M4	148	5	1	8.58
77	M4	160	2	1	9.17
84	M4	172	1	1	8.66
87	M4	178	2	1	4.13
90	M4	184	2	1	4.48

Unidentified fish larvae

Tow Number	Ship Code	CTD Number	Region	Count	Count per 10m²
2	M4	003	2	3	21.73
9	M4		5	2	16.52
19	M4	036	6	1	6.36
21	M4	040	7	1	8.90
64	M4	134	4	2	18.38
65	M4	136	4	1	8.28
68	M4	142	4	1	8.12
70	M4	146	5	1	9.57
84	M4	172	1	1	8.66
85	M4	174	2	2	17.38
87	M4	178	2	3	12.39
91	M4	186	2	1	4.17
97	M4	197	2	1	4.63

Table 11. Average standardized numbers of larvae (per 10 m^2 of sea surface) for each taxon taken in bongo net tows in the regions (Figure 3) occupied on *McArthur* cruise 9910M4. Number in parenthesis below region number is number of tows in that region.

	Region						
	1	2	3	4	5	6	7
	(4)	(21)	(1)	(15)	(16)	(9)	(3)
Taxon							
Anguilliformes	-	-	-	-	-	0.7	-
Myrophis vafer	-	-	-	0.5	-	-	-
Ophichthus zophochir	2.1	-	-	-	-	-	-
Ariosoma gilberti	2.1	-	-	-	-	-	-
Paraconger californiensis	2.6	-	-	-	-	-	-
Avocettina bowersi	-	-	-	0.6	-	-	-
Clupeidae	9.6	-	-	-	-	-	-
Opisthonema spp.	65.3	-	-	-	-	-	-
Nansenia crassa	-	-	-	-	0.7	-	-
Bathylagus spp.	5.3	4.9	-	47.1	20.9	8.3	7.4
Bathylagus nigrigenys	-	-	17.2	1.1	-	1.0	-
Stomiiformes	-	-	-	1.7	0.5	0.7	-
Cyclothone spp.	-	15.1	-	0.6	8.0	7.2	-
Cyclothone acclinidens	-	4.2	-	-	0.9	4.5	2.5
Cyclothone signata	-	2.1	-	0.6	0.6	1.5	3.0
Diplophos spp.	-	-	-	-	-	2.0	-
Diplophos proximus	12.2	3.6	-	0.6	1.4	1.4	6.0
Diplophos taenia	-	0.3	-	-	1.0	-	-
Gonostoma atlanticum	-	-	-	-	-	1.4	-
Gonostoma ebelingi	-	0.2	-	-	-	-	-
Argyropelecus spp.	-	0.6	-	-	-	-	-
Argyropelecus sladeni	-	0.9	-	0.6	1.3	2.0	-
Danaphos oculatus	-	-	-	-	0.6	-	-
Sternoptyx spp.	-	0.4	-	25.1	13.3	19.7	75.3
Ichthyococcus irregularis	-	0.4	-	-	-	-	3.0
Vinciguerria lucetia	226.5	541.4	103.1	465.2	512.1	1013.	478.0
Chauliodus spp.	-	-	-	0.5	0.5	4.3	6.0
Stomias spp.	-	-	-	0.6	-	0.7	-
Stomias atriventer	-	0.6	-	-	-	-	-
Astronesthinae	-	-	-	-	-	-	3.0
Melanostomiinae	-	0.3	-	0.6	-	-	-
Bathophilus filifer	4.8	1.8	-	5.1	3.8	6.8	2.5
Eustomias spp.	-	0.4	-	-	-	0.9	-
Tactostoma macropus	-	0.2	-	-	-	-	-
Idiacanthus spp.	2.6	3.0	-	3.3	9.6	4.4	-
Rosenblattichthys volucris	-	-	-	-	4.9	3.3	-
Scopelarchoides nicholsi	2.6	2.9	-	3.8	11.4	-	3.0
Scopelarchus guentheri	-	0.2	-	-	-	-	-
Synodus evermanni	2.1	-	-	-	-	-	-
Lestidiops spp.	-	-	-	-	5.9	0.7	-
Lestidiops neles	31.1	2.2	-	17.4	1.4	-	-

Taxon	Region 1	2	3	4	5	6	7
Lestidium spp.	-	0.8	-	5.3	16.1	24.3	-
Stemonosudis macrura	-	0.8	-	-	6.5	5.0	8.9
Evermannella ahlstromi	-	1.3	-	-	2.0	5.0	5.4
Myctophiformes	-	-	-	0.6	-	-	-
Scopelengys spp.	-	-	-	-	0.8	-	-
Myctophidae	-	3.1	-	1.6	3.9	4.7	3.0
Bolinichthys longipes	-	1.0	-	-	0.7	3.4	-
Ceratoscopelus spp.	-	1.2	-	-	-	-	-
Ceratoscopelus townsendi	-	29.8	-	-	-	-	-
Ceratoscopelus warmingii	-	3.3	-	-	0.6	0.5	11.9
Diaphus spp.	193.1	43.8	-	121.5	43.6	27.4	20.8
Lampadena urophaos	-	4.3	-	-	1.5	1.8	-
Lampanyctus spp.	-	4.2	-	35.6	20.2	64.5	25.3
Lampanyctus parvicauda	8.6	3.7	8.6	32.7	2.9	6.0	3.0
Lampanyctus tenuiformes	-	0.2	-	-	-	-	-
Nannobrachium bristori	-	0.2	-	1.2	-	-	-
Nannobrachium idostigma	-	3.4	-	-	-	-	-
Nannobrachium ritteri	-	0.4	-	-	-	-	-
Notolychnus valdiviae	-	-	-	1.6	23.3	16.1	13.4
Notoscopelus resplendens	-	0.6	-	-	2.7	-	-
Parvilux ingens	-	0.4	-	-	-	-	-
Triphoturus mexicanus	-	26.1	-	-	1.2	-	-
Triphoturus nigrescens	-	0.5	-	-	0.5	-	-
Benthosema panamense	27.1	-	-	4.2	-	-	-
Diogenichthys atlanticus	-	0.4	-	-	0.5	-	-
Diogenichthys laternatus	69.2	84.4	34.4	1137.	184.1	224.5	141.5
Gonichthys tenuiculus	-	0.8	-	3.8	0.5	-	3.0
Hygophum spp.	-	1.5	-	-	-	-	-
Hygophum atratum	4.3	13.5	-	-	2.3	-	-
Hygophum proximum	-	3.0	-	-	17.4	15.1	24.8
Loweina rara	-	1.4	-	-	0.7	0.8	-
Myctophum spp.	-	-	-	-	4.5	7.9	-
Myctophum asperum	-	-	-	-	3.2	0.9	-
Myctophum aurolaternatum	4.3	-	-	4.9	4.8	2.7	4.9
Myctophum lychnobium	-	-	-	-	3.1	-	-
Myctophum nitidulum	-	1.6	-	0.5	14.2	2.5	-
Protomyctophum crockeri	-	1.2	-	-	-	-	-
Symbolophorus californiensis	-	0.7	-	-	0.9	-	-
Symbolophorus evermanni	-	0.6	-	0.5	11.3	45.4	10.9
Trachipterus altivelis	-	0.4	-	-	-	-	-
Trachipterus fukuzakii	-	-	-	0.6	0.3	1.0	-
Zu cristatus	-	-	-	0.5	-	-	-
Bregmaceros spp.	2.2	5.2	-	3.8	34.5	30.2	3.0
Bregmaceros bathymaster	432.3	-	-	-	-	-	-
Nezumia spp.	-	0.2	-	0.6	-	-	-
Cherublemma emmelas	7.7	-	-	-	-	-	-
Melanocetus spp.	-	-	-	0.6	-	-	3.0
Oneirodes spp.	-	-	-	1.2	1.3	0.8	-

Taxon	Region 1	2	3	4	5	6	7
Cryptopsaras couesii	-	-	-	-	-	0.9	-
Ceratias holboelli	-	-	-	-	-	1.8	-
Cheilopogon xenopterus	-	-	-	0.6	0.5	-	-
Exocoetus spp.	-	0.2	-	-	-	-	-
Oxyporhamphus micropterus	-	-	-	2.9	2.8	-	2.5
Melamphaes spp.	1.9	1.0	-	5.7	0.5	3.0	2.5
Melamphaes lugubris	-	0.8	-	-	-	-	-
Scopelogadus bispinosus	2.1	4.9	8.6	7.4	5.6	2.1	-
Macroramphosus gracilis	-	2.2	-	-	-	-	-
Pontinus spp.	-	-	-	0.6	-	-	-
Howella spp.	-	0.3	-	-	6.8	0.7	3.0
Howella pammelas	-	-	-	-	3.6	10.5	-
Serraninae	1.9	-	-	-	-	-	-
Diplectrum spp.	-	0.2	-	-	-	-	-
Paralabrax spp.	-	0.4	-	-	-	-	-
Anthiinae	-	0.4	-	-	0.6	-	-
Priacanthidae	2.1	-	-	-	-	-	-
Carangidae	-	-	-	-	0.4	-	-
Caranx spp.	3.8	-	-	-	1.3	-	77.7
Selar crumenophthalmus	13.4	-	-	-	-	-	-
Coryphaena equiselis	-	0.5	-	0.6	0.7	1.0	6.0
Coryphaena hippurus	-	0.2	-	0.6	0.5	-	-
Brama spp.	-	-	-	-	-	0.7	-
Brama dussumieri	-	-	-	0.6	1.9	2.4	5.9
Sciaenidae	1.9	-	-	-	-	-	-
Mugil spp.	7.7	-	-	-	-	-	-
Polydactylus approximans	17.1	-	-	-	-	-	-
Polydactylus opercularis	9.6	-	-	-	-	-	-
Pomacentridae	-	1.1	-	-	-	-	-
Halichoeres spp.	-	0.2	-	-	-	-	-
Chiasmodon niger	-	1.4	-	1.0	1.8	2.6	-
Kali spp.	-	-	-	-	0.4	-	-
Hypsoblennius brevipinnis	2.1	-	-	-	-	-	-
Synchiropus atrilabiatus	-	-	-	1.2	-	-	-
Eleotridae	141.1	-	17.2	16.9	-	-	-
Gobiidae	8.6	-	-	0.5	-	-	-
Microdesmus spp.	5.8	-	-	-	-	-	-
Diplospinus multistriatus	-	0.2	-	-	-	-	-
Gempylus serpens	-	1.3	-	2.5	3.1	2.0	6.0
Nealotus tripes	-	-	-	0.5	0.4	0.9	-
Ruvettus pretiosus	-	-	-	-	-	0.8	-
Auxis spp.	57.2	-	-	9.9	5.4	1.2	6.0
Katsuwonus pelamis	-	-	-	-	-	4.1	-
Thunnus spp.	-	0.8	-	0.3	0.4	1.8	5.9
Cubiceps baxteri	-	1.7	-	-	-	-	-
Cubiceps pauciradiatus	17.8	15.0	-	35.0	11.3	4.4	52.7
Psenes spp.	2.1	-	-	-	-	-	-
Psenes arafurensis	-	-	-	-	0.6	-	3.0

Taxon	Region 1	2	3	4	5	6	7
Psenes sio	8.4	-	-	10.9	0.5	-	-
Tetragonurus cuvieri	-	0.4	-	-	-	-	-
Paralichthyidae	3.8	-	-	-	-	-	-
Citharichthys platophrys	4.3	-	-	-	-	-	-
Syacium ovale	2.1	-	-	3.4	-	-	-
Bothus spp.	-	-	8.6	3.9	-	-	-
Symphurus spp.	29.9	-	17.2	0.6	-	-	-
Symphurus callopterus	2.1	-	-	-	-	-	-
Balistidae	1.9	-	-	-	-	-	-
Disintegrated fish larvae	2.2	2.1	-	1.7	2.0	1.0	-
Unidentified fish larvae	2.2	2.9	-	2.3	1.6	0.7	3.0

PHYLOGENETIC INDEX TO TABLES 4, 6 AND 10.

ALPHABETICAL INDEX TO TABLES 4, 6 AND 10.

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