

# Final Report

## NGS Grants 4888-92 and 5083-93

### Decapod Crustacea from Cocos Island, Costa Rica

**National Geographic Society**, Grant No. 4888-92, Decapod Crustacea of Cocos Island, Eastern Pacific. 1992 - 1994. \$10,669.

**National Geographic Society**, Grant No. 5083-93, Involvement of Costa Rican Scientists in Decapod Crustacea Research (supplement to above). 1993-1994. \$4,990.

By a letter of June 10, 1993, from Steven Stettes, then Secretary of the Committee for Research and Exploration of NGS, I was awarded a supplemental grant of \$4,990 for the purpose of involving Costa Rican scientists on our planned and NGS-funded expedition to the remote Isla del Cocos (Cocos Island), Costa Rica, and for the "Park Usage Fee" levied on all 8 expedition members.

#### **Abstract**

Cocos Island, an isolated volcanic outcropping located approximately 550 km off the western coast of Costa Rica and a unit of the Costa Rican National Marine Parks (and now a UNESCO World Heritage Site), was the subject of a week-long survey of the marine macroinvertebrate animals (primarily decapod crustaceans and ophiuroid echinoderms). Scientists from the United States and Costa Rica, led by Dr. Joel W. Martin of the Natural History Museum of Los Angeles County, collaborated to survey a variety of marine habitats, including mudflats, coral reefs, coral rubble, and intertidal rock zones, using several different collecting techniques (yabby pumps, SCUBA diving, snorkeling, netting, and trapping). Many of the species collected represent new records for Cocos Island, and some represent undescribed species never previously seen. Species diversity was documented using color photography, and the resulting specimens were divided between US and Costa Rican research institutions for future research.

#### **1. Expedition**

In February of 1994, a group of seven marine biologists left Los Angeles for Costa Rica, where they met their eighth team member and boarded the ship *Undersea Hunter* bound for Cocos Island, a tiny island some 550 km off the western coast of Costa Rica. Scientists on the expedition included Drs. Joel W. Martin (Natural History Museum of Los Angeles County; expedition leader and grant PI), Gordon Hendler (Natural History Museum of Los Angeles County; expert on ophiuroid echinoderms), Nicholas Gotelli (University of Vermont; expert in marine ecology), Darryl Felder (University of Southwestern Louisiana [now the University of Louisiana at Lafayette]; expert on decapod Crustacea), Todd Zimmerman (then a graduate student at UCLA, now on faculty at Long Island University, New York), Lisa Torres (then a graduate student at UCLA, now on faculty on California State University Los Angeles; expert on ostracode crustaceans), Chuck Mitchell (Marine Environmental Consulting, an independent marine biologist and videographer based in Los Angeles), and Ana Dittel (at the time the

Director of the Zoological Museum of the University of Costa Rica, now at the University of Delaware).

The expedition consisted of collecting marine specimens by hand, by yabby pump, by SCUBA diving, by limited use of traps, and by dip net. Dive and collecting sites numbered more than 100, including the offshore undersea mountain, Calypso. Most of the work was done in relatively shallow water (intertidal down to 20 meters). The work resulted in the collection of literally thousands of specimens of marine invertebrates, primarily decapod crustaceans and ophiuroid echinoderms, as these were the two main groups highlighted in our collecting permits and for which we had on-board expertise. Many of the species proved to be new to science as anticipated. Specimens were returned to the Natural History Museum of Los Angeles County and to the Zoological Museum at the University of Costa Rica, where they continue to support and fuel biodiversity research on Cocos Island and the eastern Pacific in general.

## 2. Publications

Several indirect publications (work that was indirectly supported by our expedition and collections) and one large direct publication (Zimmerman and Martin, 1997) have resulted to date from these collections (below). More studies are underway by marine scientists all over the world who continue to study various components of the collections.

- Kuck, H. G., and J. W. Martin. 1994. Redescription, description of the male, and new distribution records for the homolid crab *Paromola faxoni* (Schmitt) in the eastern Pacific Ocean. *Journal of Crustacean Biology* 14(1): 177-187.
- Moran, D. A., and A. I. Dittel. 1994. Anomuran and Brachyuran Crabs of Costa Rica: annotated list of species. *Review Biologia Tropica* 41(3): 271-289.
- Guinot, D., and J. W. Martin. 1995. *Dicranodromia simplicia*, sp. nov. Pp. 255-259 In: Guinot, D. 1995. *Crustacea Decapoda Brachyura: Revision des Homolodromiidae Alcock, 1900*. *Memoirs du Museum National d'Histoire Naturelle* 163 (Resultats des Campagnes MUSORSTUM, vol. 13, ed. A. Crosnier).
- Martin, J. W., and D. Guinot. 1995. *Dicranodromia alphonsi*, sp. nov. Pp. 261-265 In: Guinot, D. 1995. *Crustacea Decapoda Brachyura: Revision des Homolodromiidae Alcock, 1900*. *Memoirs du Museum National d'Histoire Naturelle* 163 (Resultats des Campagnes MUSORSTUM, vol. 13, ed. A. Crosnier).
- Rodriguez, A., and J. W. Martin. 1997. Larval development of the crab *Xantho poressa* (Decapoda: Xanthidae) reared in the laboratory. *Journal of Crustacean Biology* 17(1): 98-110.
- Martin, J. W., and T. L. Zimmerman. 1997. Subphylum Crustacea. 2. Order Decapoda. Pp. 49-120 In: *Taxonomic atlas of the benthic fauna of the Santa Maria Basin and western Santa Barbara Channel* (J. A. Blake and P. H. Scott, editors). Vol. 10. The Arthropoda -- The Pycnogonida. The Crustacea Part 1 -- The Decapoda. Santa Barbara Museum of Natural History, Santa Barbara, California.
- Martin, J. W., A. Rodriguez, and T. L. Zimmerman. 1998. Morphological description of the first zoeal stage of the tropical xanthid crab *Panopeus purpureus* Lockington, 1877 (Crustacea, Decapoda, Brachyura, Xanthidae). *Ciencias Marinas* 24(2): 225-232.

Martin, J. W., C. Sanchez, and R. Pereyra. 1997. Notes on the distribution of two lithodid crabs (Crustacea: Decapoda: Anomura) from off the coast of Baja California Sur, Mexico. Bulletin of the Southern California Academy of Sciences 96 (2): 78-86.

Zimmerman, T. L., and J. W. Martin. 1999. Brachyuran crabs of Cocos Island (Isla del Coco), Costa Rica: Leucosiidae, Calappidae, and Parthenopidae, with descriptions of two new species. Journal of Crustacean Biology 19(3): 643-668.

### 3. Financial Accounting:

The supplemental grant (5083-93) was in the amount of \$4,990. The purpose was to include an additional scientist from the host country (Costa Rica) and another scientist to dive with her for safety reasons (Lisa Torres, UCLA graduate student):

Dr. Ana Dittel (at that time Director of the Zoological Museum at the University of Costa Rica, and now at the University of Delaware)

Dr. Lisa Torres (at the time a graduate student at UCLA, now on faculty at Cal. State University Los Angeles)

Travel (air fare and ship time on board <i>Undersea Hunter</i> ):	\$2,295/person x 2	\$4,590
Cocos Island National Park Usage Fee:	\$ 50/person x 8	\$ 400
Total of Grant Supplement:		<u>\$4,990</u>

These funds were sent directly by NGS to Andy Turpin, of Ocean Voyages, Inc., who arranged all of the travel and logistics for this expedition.

See copy of (1) 10 June 1993 award letter from Steven Stettes, (2) my 21 September 1993 reply to him, (3) the Grant Payment Request Form made out to Andy Turpin of Ocean Voyages, and (4) the cover letter of 19 January 1994 from Steven Stettes to Ocean Voyages that accompanied the check from NGS in the amount of \$4,990.

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Joel W. Martin  
August, 2005