

# THE ECHINODERM NEWSLETTER

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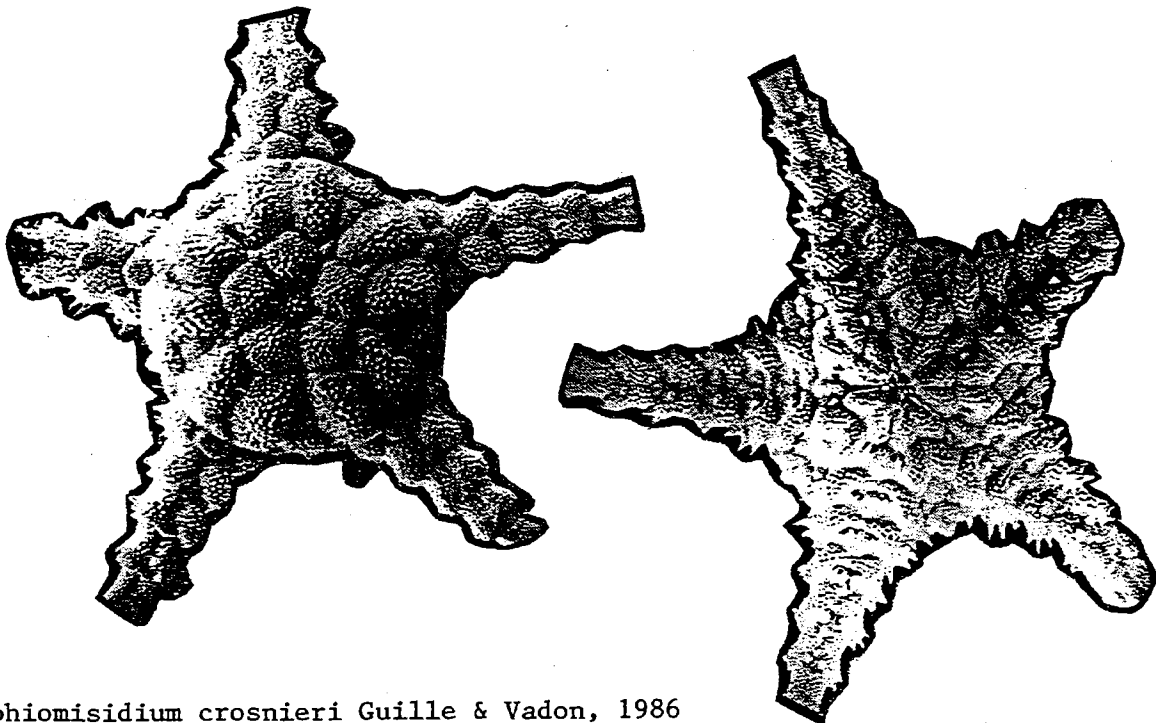
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The newsletter contains information concerning meetings and conferences, publications of interest to echinoderm biologists, titles of theses on echinoderms, and research interests, and addresses of echinoderm biologists. Individuals who desire to receive the newsletter should send their name, address and research interests to the editor.

The newsletter is not intended to be a part of the scientific literature and should not be cited, abstracted, or reprinted as a published document.



*Ophiomisdium crosnieri* Guille & Vadon, 1986

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## ECHINODERM SPECIALIST'S KEYWORD LIST

ABREU, MARIA HELENA	ECHINOIDEA
ABREU, MERCEDES	SYSTEMATICS ECOLOGY
ADAMS, NIKKI	UV SEA-URCHIN EGG EMBRYO DEVELOPMENT
ADAMS, SEREAN	CRYOPRESERVATION EMBRYO EGGS LARVAE <i>Evechinus chloroticus</i>
ADDISON, JASON	GENE-FLOW DISPERSAL EVOLUTION MICROSATELLITE-DNA
AGATSUMA, YUKIO	ECHINOIDEA ECOLOGY POPULATION-DYNAMICS
AHEARN, CYNTHIA	AXONOMY HOLOTHUROIDEA ASTEROIDEA ECHINOIDEA OPHIUROIDEA
AHLGREN, MOLLY	HOLOTHUROIDEA DEPOSIT-FEEDING
ALBI, YVONNE	ECHINOIDEA PALEOCENE
ALCOCK, NICOLA	REPRODUCTION TAXONOMY DISTRIBUTION-and-ABUNDANCE
ALI, MOHAMED SAID	ECHINOIDEA TERTIARY MESOZOIC
ALLEN, JOHN	BIODIVERSITY FUNCTIONAL-MORPHOLOGY
ALLISON, WILLIAM	TAXONOMY ECOLOGY BIOGEOGRAPHY FORAGING ASTEROIDEA
AMEZIANE, NADIA	CRINOIDEA
ANDACHT, TRACY	ECHINOIDEA DEVELOPMENT DISPERSAL
ANDERSON, OWEN	ECHINOIDEA MARINE-ECOLOGY POPULATION-BIOLOGY TAXONOMY
ANDERSON, ROLAND	TAXONOMY AQUARIUM-HUSBANDRY NATURAL-HISTORY
ARAKAKI, YUJI	ECHINOIDEA ECHINOMETRA TAXONOMY PHYLOGENY
ARCHER, JEFFREY	ECHINODERMS AQUACULTURE SEA-CUCUMBER HOLOTHURIA BECHE-DE-MER AQUARIUMS
ARISOLA, AMELIA	CULTURE MEDICINAL-VALUE BIOLOGY
ARONSON, RICHARD	PREDATION-ON-ECHINODERMS Tropics to Antarctica
ASHA, PAYIKAT S.	SEA-CUCUMBER TAXONOMY NUTRITION ECOLOGY BIOLOGY HATCHERY CULTURE
AUSICH, WILLIAM	CRINOIDEA TAPHONOMY PHYLOGENY TAXONOMY
BALHOFF, JAMES	MOLECULAR-EVOLUTION SEA-URCHINS
BALSER, ELIZABETH	EVOLUTION DEVELOPMENT MORPHOLOGY PHYSIOLOGY
BANGI, HELEN GRACE	CULTURE MANAGEMENT REPRODUCTION
BARBOSA LESDESMA, ISRAEL	ECHINOIDEA CIDARIDAE TAXONOMY
BARICCHI, ELISA	CRINOIDEA COMATULIDA
BARKER, MICHAEL	REPRODUCTION FEEDING OPHIUROIDEA
BARTSCH, ILSE	OPHIUROIDEA
BASCH, LARRY	ECHINOIDEA ASTEROIDEA LARVAE JUVENILES BENTHIC-POPULATION COMMUNITY-ECOLOGY
BAUER, JOHN	ECHINOIDEA DISEASE BACTERIA FLAGELLATES
BAUMILLER, TOMASZ	CRINOIDEA ISOCRINIDS FOSSIL RECENT
BAZHIN, ALEXANDER	ECHINOIDEA POPULATION
BEAVER, HAROLD	BLASTOIDS MORPHOLOGY SYSTEMATICS
BECKER, JOHANN	SYSTEMATICS ECOLOGY ZOOGEOGRAPHY
BEGBIE, KIRSTEN	OPHIUROIDEA
BELL, BRUCE	TAXONOMY FUNCTIONAL-MORPHOLOGY
BELL, MIKE	OPHIUROIDEA ASTEROID PALEOBIOLOGY LOWER-CRETACEOUS
BENAVIDES, MILENA	TAXONOMY SYSTEMATICS
BENTLEY, ANDREW	ECHINOIDEA GENETICS BIOLOGY PALAEOONTOLOGY
BERENTS, PENELOPE	ECHINODERM-COLLECTIONS AUSTRALIA INDO-WEST-PACIFIC
BERGEN, MARY	HOLOTHUROIDEA TAXONOMY
BERTRAM, DOUGLAS	ECHINOIDEA LARVAE EVOLUTION ECOLOGY DEVELOPMENT
BIERMANN, CHRISTIANE	SPECIATION POPULATION-GENETICS MOLECULAR-EVOLUTION GAMETIC-REPRODUCTIVE-ISOLATION -(in camarodont urchins)
BILLETT, DAVID	TAXONOMY HOLOTHUROIDEA
BIN ABDUL ADZIS, KEE ALFIAN	SEA-URCHIN <i>Diadema setosum</i> POPULATION-DYNAMICS GUT-CONTENT SIZE-FREQUENCY
BIRENHEIDE, RUEDIGER	BIOMECHANICS AQUACULTURE
BIRKELAND, CHARLES	CORAL-REEF-ECOSYSTEM-MANAGEMENT
BIRYUKOVA, INGA	CHEMORECEPTION SENSORY-SYSTEMS MIGRATIONS
BITTER, RICARDO	TAXONOMY BIODIVERSITY TROPHIC-STRUCTURE COMMUNITY
BLACK, ROBERT	ECOLOGY FUNCTIONAL-MORPHOLOGY POPULATION-DYNAMICS ECHINOIDEA
BLAKE, DANIEL	ASTEROIDEA PHYLOGENY PALEOECOLOGY
BOCKELIE, JOHAN	ONTOGENY TAXONOMY FUNCTIONAL-MORPHOLOGY
BOCZAROWSKI, ANDRZEJ	HOLOTHUROIDEA ASTEROIDEA OPHIUROIDEA CYCLOCYSTOIDEA OPHIOCISTIOIDEA ECHINOIDEA PALEOECOLOGY ANATOMY SYSTEMATICS FOSSIL RECENT
BOETTGER, ANNE	PHYSIOLOGY BEHAVIOR ECHINOIDEA

BONASORO, FRANCESCO CRINOIDEA REGENERATION ECHINOIDEA MUTABLE-COLLAGENOUS-TISSUE  
 BORGES, MICHELA OPHIUROIDEA SYSTEMATICS ECOLOGY  
 BORRERO, GIOMAR TAXONOMY ECHINODERMS CARIBBEAN  
 BORZONE, CARLOS POPULATION-DYNAMICS ECOLOGY CULTURE  
 BOSCH, ISIDRO LARVAL-ECOLOGY REPRODUCTION LIFE-HISTORY-EVOLUTION  
 BOUDOURESQUE, CHARLES *Paracentrotus-lividus* FEEDING-BEHAVIOR NUTRITION ECOLOGY ECHINOIDEA  
 BRAY, RICHARD OPHIUROIDEA ECOLOGY MICROSTRUCTURE  
 BREGMAN, YURIY SIZE-AGE-STRUCTURE GROWTH MORTALITY RECRUITMENT  
 BRETON, GERARD ASTEROIDEA CRINOIDEA EVOLUTION TAXONOMY CRETACEOUS  
 BREWIN, PAUL ECHINOIDEA  
 BREY, THOMAS GROWTH MORTALITY PRODUCTIVITY TROPHIC-LINKS  
 BROGGER, MARTIN BIODIVERSITY TROPHIC-ECOLOGY ASTEROIDEA  
 BROWER, JAMES PALEOBIOLOGY PALEOZOIC CRINOIDEA BLASTOZOA  
 BUARUANG, JAMREARN BIOLOGY ECOLOGY POLLUTION ENVIRONMENT  
 BUITRON-SANCHEZ, BLANCA FOSSIL CENOZOIC ASTEROIDEA ECHINOIDEA  
 BUNDRICK, CARLA TAXONOMY LARVAL-DEVELOPMENT OPHIUROIDEA  
 BURCH, BEATRICE BIODIVERSITY  
 BURNS, CASEY PALEONTOLOGY TAPHONOMY COLD-SEEP EOCENE OLIGOCENE  
 BUSSARAWIT, SOMCHAI TAXONOMY ECHINODERMS ANDAMAN-SEA  
 BUSTER, PETER STRATIGRAPHY DISTRIBUTION  
 BUSTOS ROJAS, HECTOR CULTURE NUTRITION REPRODUCTION GENETICS  
 BYRNE, MARIA DEVELOPMENT REPRODUCTION EVOLUTION FUNCTIONAL-MORPHOLOGY  
 CAMERON, R. ANDREW EMBRYONIC-DEVELOPMENT LARVAL-DEVELOPMENT POPULATION-GENETICS  
 CAMPAGNA, SOPHIE HOLOTHUROIDEA SEA-CUCUMBER PARASTICHOPUS POPULATION-DYNAMICS STOCK-ASSESSMENT  
 CAMPBELL, ALAN ECOLOGY POPULATION FISHERY ECHINOIDEA HOLOTHUROIDEA  
 CAMPBELL, ANDREW ECHINOIDEA ASTEROIDEA PEDICELLARIAE BEHAVIOUR ECOLOGY CORAL-REEFS  
 CAMPBELL, DAVID ASTEROIDEA PREDATION SYSTEMATICS BEHAVIOR ECOLOGY  
 CAMPOS-CREASEY, LUCIA TAXONOMY SYSTEMATICS HOLOTHUROIDEA  
 CANDIA-CARNEVALI, M. D. ECHINOIDEA OPHIUROIDEA CRINOIDEA REPRODUCTION  
 CANNON, LESTER ECHINODERM-HOSTS-PARASITES  
 CARDER, NANCY TAXONOMY  
 CAREY JR, ANDREW MARINE-BENTHIC-ECOLOGY  
 CARROLL, DAVID FERTILIZATION EARLY-DEVELOPMENT EGG SPERM CALCIUM SEA-URCHIN STARFISH  
 DEVELOPMENTAL-BIOLOGY SIGNAL-TRANSDUCTION CLONING EGG-ACTIVATION  
 CASTRO, JOAO ECOLOGY HUMAN-PREDATION POLLUTION  
 CHANG, YA-QING SEA-URCHIN-MARICULTURE  
 CHAO, SHYH-MIN ASEXUAL-REPRODUCTION POPULATION-ECOLOGY LIFE-HISTORY SYSTEMATICS  
 CHAVARRO, SONIA BEJARANO OPHIUROIDEA ECOLOGY HABITAT-PREFERENCE  
 CHENUIL, ANNE SPECIATION EVOLUTION BIODIVERSITY POPULATION-GENETICS MOLECULAR-MARKERS DNA DALP VNTR  
 CHIA, FU-SHIANG REPRODUCTION LARVAL-DEVELOPMENT EVOLUTION  
 CHING, CHONG VING HOLOTHUROIDEA TAXONOMY  
 CHONE, THERESE ECHINOIDEA PHYLOGENY  
 CHRISTENSEN, ANA BEARDSLEY OPHIUROIDEA PHYSIOLOGY RESPIRATION BEHAVIOR  
 CINTRA BUENROSTRO, CARLOS BIOGEOGRAPHY TAXONOMY ECOLOGY EVOLUTION  
 CLARK, ROGER TAXONOMY BIODIVERSITY ASTEROIDEA ALASKA NORTH-PACIFIC PTERASTERIDAE SOLASTERIDAE  
*Hippasteria*  
 CLEMENTS, LEE ANN OPHIUROIDEA ECHINOIDEA GENE-EXPRESSION REGENERATION LARVAL-TOXICOLOGY  
 CLOUSE, RONALD HOLOTHUROIDEA BEHAVIOR TAXONOMY ECOLOGY MICRONESIAN  
 CLOUTE, M. EUGENIA OPHIUROIDEA TAXONOMY BIOGEOGRAPHY ANTARCTIC  
 CONAND, CHANTAL TROPICAL-REEFS HOLOTHURIANS URCHINS EXPLOITATION ECOLOGY  
 CRUMP, ROBIN ASTEROIDEA EMBRYOLOGY ECOLOGY BEHAVIOUR  
 CUENCA, CATHERINE BURROWING-SEA-URCHINS *Paracentrotus-lividus* *Psammechinus-miliaris* POPULATION-DYNAMICS  
 CUNHA DE JESUS, DORA MARIA BIOZOOGEOGRAPHY TAXONOMY SYSTEMATICS ECOLOGY  
 CUNNINGHAM, ADELE ECHINOIDEA REPRODUCTION LYTECHINUS-VARIEGATUS  
 DAFNI, JACOB ECHINOIDEA ECOLOGY TERATOLOGY POLLUTION-EFFECTS  
 DALBY, JR., JAMES ENVIRONMENTAL-IMPACT SEDIMENTATION WASTE AQUACULTURE  
 DANTAS GENTIL, MARIA C. ASTEROIDEA OPHIUROIDEA BEHAVIOR-ECOLOGY  
 DARTNALL, ALAN TAXONOMY REPRODUCTION ASTERINIDAE  
 DAUTOV, SALIM ECOLOGY ULTRASTRUCTURE ECHINODERM LARVAE  
 DAVID, BRUNO ECHINOIDEA PALEONTOLOGY PHYLOGENY  
 DAVID, JEROME STALKED-CRINOIDS ONTOGENY BATHYMETRY  
 DAVIS, JENNIFER SEA-URCHIN-FISHERY ECOLOGY  
 DAVOULT, DOMINIQUE OPHIUROIDEA PRODUCTION REPRODUCTION SUSPENSION-FEEDING C-AND-N-FLUXES  
 DAYTON, PAUL ECOLOGY SYSTEMATICS LIFE-HISTORY CONSERVATION  
 DE RIDDER, CHANTAL ECHINOIDEA SYMBIOSES FEEDING-MECHANISMS TAXONOMY ZOOGEOGRAPHY  
 DE WIT, WALTER ECHINOIDEA FLINT-PLEISTOCENE-DEPOSITS  
 DEAN, JULIETTE ECHINOIDEA PALEONTOLOGY PHYLOGENY

DEARBORN, JOHN  
 DEHEYN, DIMITRI  
 DEL VALLE, ROSA  
 DETWILER, PAUL  
  
 DEUTZMANN, HELMUT  
 DEVIN, MICHAEL  
 DEWAEI, YANNICK  
 DIEHL, WALTER  
 DOBSON, WILLIAM  
 DOLMATOV, IGOR  
 DOMINGUEZ ALONSO, PATRICIO  
  
 DONOVAN, STEPHEN  
 DORNBOSS, STEPHEN  
 DRUMM, DARRIN  
 DRUMMOND, ANNE  
 DUPONT, SAMUEL  
 DY, DANILO  
 EAGLE, MIKE  
 EBERT, THOMAS  
 EBLE, GUNTHER  
 ELISEIKINA, MARINA  
 ELLERS, OLAF  
 EMLET, RICHARD  
 EMSON, ROLAND  
 ENTRAMBASAGUAS, LAURA  
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 ETNIER, SHELLEY  
 ETTENSOHN, FRANK  
 EVDOKIMOV, VLADIMIR  
 FARMANFARMAIAN, A. VERDI  
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 FEDER, HOWARD  
 FEINBERG, JOSHUA  
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 FERGUSON, JOHN  
 FERNANDEZ, CATHERINE  
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 FLAMMANG, PATRICK  
 FLOWERS, JONATHAN  
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 FOLTZ, DAVID  
 FONTANELLA, FRANK  
 FOSSHAGEN, HARALD  
 FOSTER, MERRILL  
 FOX, DAVID  
 FRANCOUR, PATRICE  
 FREEMAN, STEVEN  
 FRONTANA URIBE, SARITA  
 FRYE, BRIAN  
 FUJITA, TOSHIHIKO  
 GAGE, JOHN  
 GAGNON, JEAN-MARC  
 GAHN, FOREST  
 GALLEMI, JAUME  
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 GARRISON, ROBERT  
 GEBRUK, ANDREY  
 GENTIL, FRANCK  
 GEORGE, SOPHIE  
 GIBBS, BARBARA  
 GIBSON, MICHAEL  
  
 CRINOIDEA OPHIUROIDEA FUNCTIONAL-ANATOMY ECOLOGY TAXONOMY  
 OPHIUROIDEA BIOLUMINESCENCE ECOTOXICOLOGY PHYSIOLOGICAL-STRESS  
 HOLOTHUROIDEA  
 ECHINOIDEA POPULATION-DYNAMICS PHENOTYPIC-PLASTICITY LIFE-HISTORY  
 ECHINOID-CORAL-INTERACTIONS  
 ASTEROIDEA RECENT SYSTEMATICS  
 DEVELOPMENT-ECHINODERM-AQUACULTURE-TECHNIQUES  
 OPHIUROIDEA BIOLUMINESCENCE PHYSIOLOGY NERVOUS-CONTROL  
 NATURAL-SELECTION  
 OPHIUROIDEA ECOLOGY  
 REGENERATION-MECHANISMS MORPHOLOGY DEVELOPMENT ECOLOGY  
 CARPOIDEA CTENOCYSTOIDEA CORNUTA MITRATA SOLUTA CINCTA CALCICHORDATES CYSTOIDS  
 PENTAMERISM SPAIN CAMBRIAN ORDOVICIAN FUNCTION PHYLOGENY EVOLUTION TOMOGRAPHY 3D  
 PALAEOLOGY BRITISH-ISLES CARIBBEAN ECHINOIDEA CRINOIDEA  
 HELICOPLAOIDEA PALEOECOLOGY CAMBRIAN  
 HOLOTHUROIDEA FISHERIES  
 ECHINOIDEA ECOLOGY REPRODUCTION LIFE-HISTORY  
*Amphipholis-squamata* BIOLUMINESCENCE MICROEVOLUTION INTRASPECIFIC-VARIABILITY  
 ECOPHYSIOLOGY NUTRIENT-EXCRETION OXYGEN-CONSUMPTION ENERGETICS  
 CRINOIDEA ASTEROIDEA ECHINOIDEA OPHIUROIDEA  
 LIFE-HISTORIES DEMOGRAPHY  
 BIODIVERSITY DEVELOPMENT EVOLUTION  
 REGENERATION-MECHANISMS MORPHOLOGY IMMUNOLOGY  
 ECHINOIDEA BIOMECHANICS EVOLUTION ECOLOGY  
 LARVAE SEA-URCHINS PLANKTONIC-FORMS DEVELOPMENT  
 ECOLOGY  
 BIOGEOGRAPHY LARVAE-and-EVOLUTION SPATIAL-and-TEMPORAL-DISTRIBUTION SEA-URCHINS  
 PALEOBIOLOGY MORPHOLOGY DIPLOPORITA SPAIN  
 PHYSALIUS  
 CRINOIDEA BIOMECHANICS DEVELOPMENT  
 TAXONOMY FUNCTIONAL-MORPHOLOGY PALEOECOLOGY CRINOIDEA  
 ECHINOIDEA ONTOGENESIS COMMUNITIES  
 PHYSIOLOGY BIOCHEMISTRY MOLECULAR  
 BIOLUMINESCENCE OPHIUROIDEA *Amphipholis-squamata*  
 DISTRIBUTION FEEDING-BIOLOGY PREDATOR-PREY-INTERACTIONS  
 OPHIUROIDEA  
 GROWTH TAXONOMY BIOGEOGRAPHY ANTARCTICA  
 SPECIATION EVOLUTION DEVELOPMENT BIODIVERSITY GENETICS MOLECULAR-PHYLOGENY  
 PHYSIOLOGY FUNCTIONAL-ANATOMY  
 ECHINOIDEA NUTRITION GROWTH AQUACULTURE LAGOONAL-ENVIRONMENT-ECOLOGY  
 FISHERIES-MANAGEMENT AZORES  
 OPHIUROIDEA ECOLOGY DISTRIBUTION FEEDING BEHAVIOR  
 FUNCTIONAL-MORPHOLOGY BIOCHEMISTRY ADHESION BIOMECHANICS  
 MOLECULAR-BIOLOGY MORPHOLOGY  
 CULTURE BIODIVERSITY  
 MOLECULAR-EVOLUTION PHYLOGENETICS  
 ASTEROIDEA TAXONOMY  
 OPHIUROIDEA LOPHELIA  
 TAXONOMY BIODIVERSITY ECOLOGY EVOLUTION  
 OPHIUROIDEA OSSICLES BEHAVIOR  
 BIODIVERSITY ENVIRONMENTAL-IMPACT *Centrostephanus*  
 BIODIVERSITY ECOLOGY  
 ECHINODERMATA TAXONOMY MEXICO  
 ECHINOIDEA MORPHOMETRICS  
 ECOLOGY TAXONOMY OPHIUROIDEA ASTEROIDEA  
 DEMOGRAPHY GROWTH BIODIVERSITY  
 ECOLOGY BEHAVIOUR BIOTURBATION TAXONOMY  
 CRINOIDEA PALEOBIOLOGY  
 ECHINOIDEA CRETACEOUS SYSTEMATICS BIOSTRATIGRAPHY PALAEOECOLOGY  
 ANTARCTICA SEASONALITY REPRODUCTION  
 ASTEROIDEA ECOLOGY BEHAVIOR FORAGING-ACTIVITY  
 ECHINOIDEA AQUACULTURE  
 HOLOTHUROIDEA TAXONOMY  
 OPHIUROIDEA POPULATION  
 ECOLOGY BIOCHEMISTRY BEHAVIOUR MORPHOLOGY  
 TAXONOMY  
 PALEOECOLOGY BIOTIC-INTERACTIONS DEVONIAN

GIELAZYN, MICHEL	TOXICOLOGY FEEDING-BEHAVIOR ECOLOGY OPHIUROIDEA
GIL CID, MARIA DOLORES	BIODIVERSITY-&-EXTINCTION-EVENTS PALEOECOLOGY-TRENDS MORPHOLOGY PALEOBIOLOGY CAMBRIAN ORDOVICIAN SILURIAN
GINANOVA, TALIA	MUSCLE-REGENERATION-MECHANISMS
GIRASPY, D.A. BENI	ECOLOGY BIOLOGY MARICULTURE
GIUDICE, GIOVANNI	MOLECULAR-BIOLOGY DEVELOPMENTAL-BIOLOGY
GIULIANO, LAURA	SYMBIOTIC-OR-PATHOGENIC-BACTERIA-COLONIZING-SEA-URCHINS
GLENN, KRITON	BIODIVERSITY DISTRIBUTION-PATTERNS HABITAT
GLUCHOWSKI, EDWARD	CRINOIDEA TAXONOMY BIOSTRATIGRAPHY PALEOECOLOGY
GOGGIN, LOUISE	ASTEROIDEA PATHOLOGY PARASITES BIOLOGICAL-CONTROL
GOLDSCHMID, ALFRED	ECHINOIDEA MORPHOLOGY BIODIVERSITY EVOLUTION STRUCTURE-and-FUNCTION-of-AXIAL-ORGAN PODOCYTES
GONGADZE, GURAM	ECHINOIDEA LATE-CRETACEOUS PALEOGENE EVOLUTION SYSTEMATICS PALEOBIOGEOGRAPHY STRATIGRAPHY
GOODING, RICHARD	ECHINOIDEA DIADEMATID-ASSOCIATIONS
GORCHAKOV, IGOR	ECOLOGY PHYSIOLOGY LIFE-HISTORY
GOUVEIA-MONTEIRO, ANA M.	OPHIUROIDEA
GRABOWSKY-KAAIALII, GAIL	MORPHOLOGY EVOLUTION ECOLOGY SYSTEMATICS PHYLOGENY DEVELOPMENT
GREENSTEIN, BENJAMIN	ASTEROIDEA ECHINOIDEA TAPHONOMY FOSSIL RECENT CROWN-OF-THORNS STARFISH
GREENWOOD, AMY	REPRODUCTION ECOLOGY CONSERVATION
GROSJEAN, PHILIPPE	ECHINOCULTURE GROWTH POPULATION-DYNAMICS MODEL <i>Paracentrotus lividus</i>
GROVES, CATHY	ASTEROIDEA BIOGEOGRAPHY SYSTEMATICS
GRYGIER, MARK	PARASITOLOGY EPIZOIC-FAUNA GALLS-AND-CYSTS
GUDMUNDSSON, JON EGGERT	ECHINOIDEA ECOLOGY POPULATION
GUILLOU, MONIQUE	SEA-URCHIN ECOTOXICOLOGY ECOLOGY
GURREA, ISIDRO	ECHINOIDEA CRETACEOUS CENOZOIC WESTERN-EUROPEAN-MEDITERRANEAN-BASIN
GUTT, JULIAN	BIODIVERSITY ECOLOGY
HADEL, VALERIA FLORA	HOLOTHUROIDEA BIOLOGY ECOLOGY
HAGEN, NILS	ECHINOIDEA ECOLOGY DISEASE CULTIVATION
HALL, ROSEMARY	OPHIUROIDEA REGENERATION <i>Ophiothrix angulata</i> <i>Amphipholis gracillima</i> POLLUTANTS ZINC
HAMEL, JEAN-FRANCOIS	REPRODUCTION SETTLEMENT BEHAVIOR CHEMICAL-ECOLOGY
HAMMER, HUGH	NUTRITION GONAD GROWTH DEVELOPMENT ENZYMES
HAMZA HASSAN, MOHAMED	ECOLOGY
HAND, CLAUDIA	HOLOTHUROIDEA FISHERIES DISTRIBUTION
HARPER, FIONA	EVOLUTION LIFE-HISTORY HYBRIDIZATION PHYLOGENETICS
HAUDE, REIMUND	TAXONOMY PALEOECOLOGY EVOLUTION
HAVARDSSON, BJORGOLFUR	ECHINOIDEA
HEINZELLER, THOMAS	CRINOIDEA ULTRASTRUCTURE NEUROANATOMY
HENDLER, GORDON	OPHIUROIDEA TAXONOMY BEHAVIOR FUNCTIONAL-MORPHOLOGY
HENKEL, TIMOTHY	<i>Ophiothrix lineata</i> SPONGE-DWELLING HABITAT-PARTITIONING
HERDENDORF, CHARLES	ABYSSAL ASTEROIDEA BRISINGIDAE ECHINOIDEA
HERRINGSHAW, LIAM	TAXONOMY PALAEOBIOLOGY ASTEROIDEA
HESS, HANS	TAXONOMY PALEOECOLOGY CRINOIDEA ASTEROIDEA OPHIUROIDEA
HICKMAN, JR., CLEVELAND	SYSTEMATICS ECOLOGY
HIGHSMITH, RAYMOND	ECOLOGY REPRODUCTION COMMUNITY-ECOLOGY
HILL, ROBERT	HOLOTHUROIDEA COMPARATIVE-PHYSIOLOGY
HOBERG, MAX	TAXONOMY BIODIVERSITY FEEDING REPRODUCTION
HODGSON, ALAN	ASTEROIDEA MORPHOLOGY
HOFFMAN, JENNIFER	ECHINOIDEA LARVAE UV
HOLTERHOFF, PETER	CRINOIDEA FOSSIL PALEOECOLOGY SYSTEMATICS
HOOD, SARAH	TAXONOMY BIOGEOGRAPHY DEEP-WATER
HOOPER, ROBERT	ECHINOIDEA ECOLOGY AQUACULTURE CONSERVATION
HOPKINS, THOMAS	ASTEROIDEA ECHINOIDEA SYSTEMATICS
HORSTMAN, DEON	MARICULTURE ECHINOIDEA
HOSHI, MOTONORI	FERTILIZATION ACROSOME-REACTION GLYCOCONJUGATES
HOTCHKISS, FREDERICK	OPHIUROIDEA STELLEROIDEA PALEOZOIC PENTAMERISM
HOTTENROTT, SUSAN	OPHIUROIDEA TAXONOMY DEEP-SEA BIOGEOGRAPHY
HOWELL, KERRY	ASTEROIDEA ECOLOGY REPRODUCTION DISTRIBUTION POPULATION-GENETICS
HUNTER, MARGARET	ECHINOIDEA FISHERY-MANAGEMENT MONITORING ASSESSMENT
HUSEYINOGLU, FATIH	BIODIVERSITY BENTHIC-INVERTEBRATES
IRIMURA, SEIICHI	OPHIUROIDEA TAXONOMY MORPHOLOGY ECOLOGY
ISHIDA, YOSHIKI	PALEOECOLOGY PHYSIOLOGY OPHIUROIDEA
IVY, GRISILDA	SEA-CUCUMBER CULTURE TECHNOLOGY
JABLONSKI, DAVID	ECHINOIDEA CRINOIDEA FOSSIL
JACKSON, JENNIFER	IRREGULAR-ECHINOIDEA FOSSILS EVOLUTIONARY-RATE
JACOB, UTE	CIDARIDEA
JACOBSEN, NANCY	ASTEROIDEA TAXONOMY DISTRIBUTION REPRODUCTION

JAECKLE, WILLIAM LARVAE PHYSIOLOGY ECOLOGY MORPHOLOGY  
 JAGT, JOHN TAXONOMY PALEOECOLOGY BIOZ  
 JAMES, DANIEL TAXONOMY BIODIVERSITY ZOOGEOGRAPHY HATCHERY CULTURE  
 JAMES, DAVID SEA-URCHIN DIET BEHAVIOR  
 JAMIESON, GLEN BIODIVERSITY HABITAT-MODIFICATION SURVEY  
 JANIES, DANIEL ASTEROIDEA EVOLUTION DEVELOPMENT  
 JEFFERIES, RICHARD P. PHYLOGENY RELATIONSHIPS-OF-PHYLA  
 JEFFERY, CHARLOTTE ECHINOIDEA-PHYLOGENIES MORPHOLOGICAL & MOLECULAR ECHINOIDS-OVER-THE-K-T-BOUNDARY  
 ECHINOID-LARVAL-STRATEGY  
 JELL, PETER AUSTRALIA FOSSIL PALAEOZOIC CRINOIDS ASTEROZOANS CARPOIDS RHOMBIFERA EDRIOASTEROIDS  
 JELLETT, JOANNE IMMUNITY DISEASE  
 JEYABASKARAN, R. BIODIVERSITY CORAL-REEF-ASSOCIATED-ANIMALS  
 JOHNSEN, SONKE PHOTORECEPTION ORIENTATION OPHIUROIDEA  
 JOHNSON, SHERI ASTEROIDEA ASTERINID PHYLOGENY  
 JUNIO-MENEZ, ANNETTE CULTURE MANAGEMENT POPULATION-GENETICS LARVAL-ECOLOGY  
 JUNQUEIRA, ANDREA REPRODUCTION RECRUITMENT SETTLEMENT POPULATION-DYNAMICS  
 KAMMER, THOMAS CRINOIDEA PALEOZOIC TAXONOMY EVOLUTION PALEOECOLOGY  
 KASYANOV, VLADIMIR ASTEROIDEA REPRODUCTION CELLULAR-MECHANISMS  
 KAWAUCHI, GISELE YUKIMI HOLOTHUROIDEA APODIDA REPRODUCTION DISPERSION  
 KELLER, BRIAN ECHINOIDEA ECOLOGY  
 KELLEY, L. SCOTT ECHINOIDS COMATULIDS CRETACEOUS ONTOGENY CIDAROIDS  
 KELLY, MAEVE ECHINOCULTURE PSAMMECHINUS-MILLARIS NUTRITION GROWTH  
 KERR, ALEXANDER HOLOTHUROIDEA PHYLOGENY EVOLUTION SYSTEMATICS  
 KINJO, SONOKO *Echinometra* LARVAL-SKELETON EVOLUTION  
 KLIKUSHIN, VLADIMIR TAXONOMY PALEOBIOLOGY  
 KLINGER, THOMAS ECHINOIDEA HOLOTHUROIDEA NUTRITION ECOLOGY  
 KNOTT, K. EMILY ASTEROIDEA SYSTEMATICS DEVELOPMENTAL-EVOLUTION  
 KOBAYASHI, NAOMASA ECHINOIDEA MARINE-POLLUTION BIOASSAY SPAWNING-PERIODICITY  
 KOGO, ICHIZO TAXONOMY DISTRIBUTION PHYLOGENY EXISTING-CRINOIDEA  
 KOGURE, YOICHI ASTEROIDEA OPHIUROIDEA SAND-DOLLAR TAXONOMY DISTRIBUTION ECOLOGY JAPAN-SEA  
 KRISHNARAJAH, PADMINI HOLOTHUROIDEA TAXONOMY FOOD-HABITS REPRODUCTIVE-BIOLOGY  
 KROH, ANDREAS ECHINOIDEA TAXONOMY PALAEOECOLOGY BIOGEOGRAPHY CENOZOIC  
 KROHLING, WERTHER BENTHIC-ECOLOGY MARINE-ECOLOGY BIOGEOGRAPHY  
 KYTE, MICHAEL OPHIUROIDEA ASTEROIDEA TAXONOMY SYSTEMATICS ECOLOGY WORLDWIDE  
 LACEY, KATRINA HOLOTHUROIDEA  
 LAMBERT, PHILIP SYSTEMATICS HOLOTHUROIDEA TAXONOMY NATURAL-HISTORY  
 LANDEIRA FERNANDEZ, A. SEA-CUCUMBER-SMOOTH-MUSCLE Ca<sup>2+</sup>-ATPase Ca<sup>2+</sup>-transport  
 LANE, DAVID ASTEROIDEA BIODIVERSITY BIOGEOGRAPHY POPULATION-STUDIES  
 LANE, N. GARY CRINOIDEA PALEOZOIC  
 LAWLEY, JERRY ECHINOIDEA  
 LAWRENCE, JOHN NUTRITION REPRODUCTION REGENERATION AQUACULTURE ECOLOGY  
 LE MENN, JEAN SYSTEMATICS PALEOBIOLOGY PALEOECOLOGY PALEOBIOGEOGRAPHY BIOSTRATIGRAPHY  
 LEE, YOUN-HO EVOLUTION EMBRYOLOGY DEVELOPMENT  
 LEFEBVRE, BERTRAND PALEOZOIC STYLOPHORANS EOCRINOIDS PALEOBIOLOGY PALEOECOLOGY  
 LELAND, AMANDA TROPHIC-EFFECTS TAXONOMY GLOBAL-DISTRIBUTIONS/ABUNDANCES  
 LEMBO, LUIZ CRINOIDEA  
 LESSER, MICHAEL ECHINOIDEA  
 LESSIOS, HARILAOS ECHINOIDEA PHYLOGENY POPULATION-GENETICS  
 LEVIN, VALERY SHALLOW-WATER-HOLOTHUROIDEA SYSTEMATICS BIOLOGY FEEDING FISHERIES  
 LEWIS, DAVID PALAEOONTOLOGY ECHINOIDEA  
 LHEKNIM, VACHIRA TAXONOMY GULF-OF-THAILAND ANDAMAN-SEA  
 LIAO, YULIN OPHIUROIDEA HOLOTHUROIDEA TAXONOMY MARICULTURE  
 LINDSTROM, DAWN PREDATION OPHIOCOMA-ECHINATA  
 LITVINOVA, NINA OPHIUROIDEA TAXONOMY MORPHOLOGY BEHAVIOUR ECOLOGY  
 LORDSON, JINBERT HOLOTHUROIDEA  
 MACURDA, JR., D. B. TAXONOMY PALEOECOLOGY CRINOIDEA  
 MACZYNSKA, STEFANIA ECHINOIDEA MIOCENE PARATETHYS-BASIN MEDITERRANEAN  
 MAGSINO, RICHARD POPULATION-GENETICS ASTEROIDEA ALLOZYMES PCR-RFLP DNA-SEQUENCE-DATA  
 MAH, CHRISTOPHER ASTEROIDEA GONIASTERIDAE FORCIPULATES ASTERIIDAE BRISINGIDA PHYLOGENETICS TAXONOMY FEEDING  
 ECOLOGY MESOZOIC CENOZOIC SYSTEMATICS DEEP-SEA INDIAN-OCEAN PACIFIC-OCEAN  
 TAXONOMY BIOLOGY BIODIVERSITY  
 MAHARAVO, JEAN POLAR-METABOLITES BIOLOGICAL-ACTIVITY ISOLATION STRUCTURAL-ELUCIDATION  
 MAIER, MARTA SEA-URCHIN POPULATION-GENETICS FISHERY-MANAGEMENT  
 MALAY, MARIA CELIA D. ECOLOGY CRINOIDEA  
 MALDONADO, ELISA BIOLUMINESCENCE PHYSIOLOGY NEUROBIOLOGY FUNCTIONAL-ECOLOGY  
 MALLEFET, JEROME HOLOTHUROIDEA EMBRYOLOGY HATCHERY  
 MANIKANDAN K.P.

MANNI, RICCARDO	SYSTEMATICS MORPHOLOGICAL-FUNCTIONALITY CYRTOCRINID-crinoids
MANNIFIELD, KAY	PALAEOECOLOGY TAXONOMY TAPHONOMY BIODIVERSITY-(+EXTINCTIONS)
MANSO, CYNTHIA	OPHIUROIDEA ECHINOIDEA TAXONOMY CRETACEOUS
MAPLES, CHRISTOPHER	DEVONIAN CARBONIFEROUS MISSISSIPPIAN PENNSLVANIAN PERMIAN PALEOECOLOGY
MARAN, ALEKSANDRA	PALEOBIOGEOGRAPHY CRINOID BLASTOID MICROCRINOID
MARCUS, SARA	ECHINOIDEA CRETACEOUS SYSTEMATICS BIOSTRATIGRAPHY PALAEOECOLOGY TAPHONOMY
MARQUARDT, LUCIE	PALEOZOIC-CRINOIDS 'MICROCRINOIDS'
MARSH, LOISETTE	ASTEROIDEA ANTARCTICA TROPHIC-POSITION ENERGY-FLOW RESPIRATION REPRODUCTION
MARTIN, RICHARD	ASTEROIDEA TAXONOMY ZOOGEOGRAPHY
MARTINEZ, PRISCILLA	NONINDIGENOUS-MARINE-SPECIES INTRODUCTION-AND-TRANSLOCATION-VECTORS
MARTINEZ, SERGIO	MARINE-PEST-INFORMATION-SYSTEMS
MARTINS DELBONI, C.	HOLOTHUROIDEA REPRODUCTION LARVAL-BIOLOGY
MASCARENHAS, B. J.	PALEONTOLOGY TAXONOMY PALEOECOLOGY ECHINOIDEA
MASHANOV, VLADIMIR	HOLOTHUROIDEA ONTHOGENESIS LIFE-HISTORY
MASON, JOANNE	ASTEROIDEA ECOLOGY TAXONOMY POPULATION-DYNAMICS
MASSIN, CLAUDE	HOLOTHUROIDEA REGENERATION DEVELOPMENT
MASTROTOTARO, F.	ASTEROIDEA BIODIVERSITY BEHAVIOUR ECOLOGY
MATA PEREZ, EUSTOLIA	HOLOTHUROIDEA TAXONOMY ZOOGEOGRAPHY EVOLUTION
MATERIA-ROWLAND, C.	ECHINODERMS TAXONOMY
MATIAS, MIGUEL	ECHINODERMATA ASTEROIDEA LUIDIIDAE MEXICO TAXONOMY
MATTOS-SEGOVIA, ELIO	TAXONOMY BIODIVERSITY ECOLOGY
MAUBON, ROGER	ECHINOIDEA
McBRIDE, SUSAN	ECHINOIDEA LARVAE REPRODUCTION EMBRYOLOGY DEVELOPMENT
McCLINTOCK, JAMES	SYSTEMATICS ECHINOIDEA
McEUN, F. SCOTT	SEA-URCHIN NUTRITION REPRODUCTION
MCGOVERN, TAMARA	CHEMICAL-ECOLOGY REPRODUCTION NUTRITION ECOLOGY
McKENZIE, J. DOUGLAS	HOLOTHUROIDEA REPRODUCTION TAXONOMY DEVELOPMENT ECOLOGY
McLELLAND, JERRY	<i>Ophiactis</i> FISSION REPRODUCTION GENDER-SPECIFIC
McNAMARA, KENNETH	BACTERIAL-SYMBIONTS CELL-CULTURES SURFACE-COATS
MEDEIROS-BERGEN, DOT	TAXONOMY BIODIVERSITY GULFOFMEXICO WESTINDIES
MELIKOV, OKTAY HAMZA	ECHINOIDEA PALEONTOLOGY PHYLOGENY
MENDES, CARLA L. TORRES	LIFE-HISTORY-TACTICS RECRUITMENT LARVAL-MOLECULAR-IDENTIFICATION
MERCIER, ANNIE	ECHINOIDEA EVOLUTION MORPHOLOGY HOLASTEROID SPATANGOID JURASSIC CRETACEOUS EOCENE
MESSING, CHARLES	ECHINOMETRA-LUCUNTER GRAZING MACROALGAE FEEDING ECOLOGY
MEYER, CHRISTIAN	REPRODUCTION SETTLEMENT BEHAVIOUR CHEMICAL-ECOLOGY TOXICOLOGY
MEYER, DAVID	CRINOIDEA ECOLOGY BIOGEOGRAPHY SYSTEMATICS
MEZALI, KARIM	MESOZOIC-ECHINODERMS PALEOBIOLOGY TAPHONOMY
MILLER, ROBERT	CRINOIDEA PALEOZOIC MESOZOIC CENOZOIC RECENT REEFS PALEOECOLOGY FUNCTIONAL-MORPHOLOGY
MINER, BENJAMIN	TAPHONOMY
MIRONOV, ALEXANDER	CARYOLOGY ECOLOGY LIFE-CYCLES NUTRITION HOLOTHUROIDEA
MITROVIC-PETROVIC, J.	BIOGEOGRAPHY EVOLUTION FISHERY ECOLOGY
MLADENOV, PHILIP	ECHINOIDEA LARVAE PLASTICITY
MONTAGUE, CHRISTOPHER	TAXONOMY BIOGEOGRAPHY CRINOIDEA ASTEROIDEA ECHINOIDEA HOLOTHUROIDEA
MOOI, RICHARD	TAXONOMY PALEOECOLOGY BIOSTRATIGRAPHY PALEOBIOGEOGRAPHY
MOONEY, ROBERT	REPRODUCTION GENETICS ECOLOGY AQUACULTURE FISHERIES
MOORE, ABIGAIL	ASTEROIDEA REGENERATION FISHERIES
MORGAN, ANDREW	ECHINOIDEA
MORGAN, KATHERINE	COMMUNITY-ECOLOGY INTRASPECIFIC-COMPETITION
MORGAN, RAPHAEL	BIODIVERSITY SUSTAINABLE-EXPLOITATION
MORRILL, JOHN	HOLOTHUROIDEA LIFE-HISTORY DEVELOPMENT REPRODUCTION
MOTOKAWA, TATSUO	LIFE-CYCLE-EVOLUTION
MUKAI, HIROSHI	OPHIUROIDEA
MULLER, CLARE	ECHINOIDEA DEVELOPMENT
MUNK, ERIC	CATCH-CONNECTIVE-TISSUE STALKED-CRINOIDS
MUSA, NADIRAH	ECHINOIDEA ECOLOGY
NAIDENKO, TAMARA	HOLOTHUROIDEA TAXONOMY ECOLOGY
NAKAI, SAORI	GROWTH REPRODUCTION
NATARAJAN, P.	HISTOLOGY HOLOTHUROIDEA
NEBELSICK, JAMES	ECHINOIDEA METAMORPHOSIS POLLUTION BIOASSAY CRYOPRESERVATION
NEILL, BRUCE	ECHINOIDEA TAXONOMY
NEPOTE, ANA CLAUDIA	MARICULTURE FRESH-WATER-CULTURE-OF-FIN-AND-SHELL-FISH
NESTLER, HELMUT	ECHINOIDEA ECOLOGY PALAEONTOLOGY TAPHONOMY BIODIVERSITY
NEUMANN, CHRISTIAN	BIOGEOGRAPHY ECHINOMETRIDS GENETICS SYSTEMATICS
NICHOLS, DAVID	ECOLOGY-SANDY-BEACHES HOLOTHUROIDEA MEXICAN-PACIFIC WOMEN-IN-SCIENCE
	ECHINOIDEA CRETACEOUS TAXONOMY PALEOECOLOGY
	TAXONOMY PALAEOBIOLOGY CRETACEOUS ECHINOIDEA ASTEROIDEA
	FUNCTIONAL-MORPHOLOGY REPRODUCTIVE-STRATEGIES

NICOSIA, UMBERTO SYSTEMATICS PALAEOECOLOGY Jurassic crinoids EVOLUTION STRATIGRAPHY non-isocrinid crinoids  
 NISHIHARA, MORITAKA ECOLOGY BIODIVERSITY POPULATION BEHAVIOR  
 NISHIZAKI, MICHAEL ECHINOIDEA RECRUITMENT ECOLOGY JUVENILES SHELTERING  
 NITHYANANDAN, M. TAXONOMY BIODIVERSITY  
 NOBRE, CARLA CATTELAN ASTEROIDEA ECOLOGY LARVAE-DEVELOPMENT REPRODUCTION  
 NOGUEIRA LIMA, RENATA REPRODUCTION REPRODUCTION-CYCLE HOLOTHUROIDEA  
 NOJIMA, SATOSHI SEA-STAR SEA-URCHIN LIFE-HISTORY-TACTICS PREDATION-PRESSURE ECOLOGICAL-ENERGETICS  
 O'CONNOR, BRENDAN OPHIUROIDEA TAXONOMY BIOTURBATION DENSITY-REGULATORY-FACTORS  
 O'HARA, TIMOTHY TAXONOMY NATURAL-HISTORY BIOGEOGRAPHY CONSERVATION  
 O'LOUGHLIN, P. MARK HOLOTHUROIDEA TAXONOMY  
 OHTA, SUGURU TAXONOMY, DEEP-SEA ECOLOGY HOLOTHURIA ECHINODERMS  
 OJEDA, F. PATRICIO ECOLOGY BIOLOGY FEEDING-BIOLOGY DISTRIBUTION  
 OJI, TATSUO CRINOIDEA TAXONOMY EVOLUTION BIOGEOGRAPHY REGENERATION  
 OLIVARES CARDENAS, M. HOLOTHUROIDEA TAXONOMY  
 OLSZEWSKA-NEJBERT, D. CRETACEOUS-IRREGULAR-ECHINOIDS PALEOBIOGEOGRAPHY STRATIGRAPHY  
 OLVER, JANE ECOLOGY RECENT-&-FOSSIL BRITISH ECHINOIDEA  
 ORTIZ, EDUARDO MORTEO FISHERIES ASTEROIDEA  
 OTERO, MARIA DEL MAR AQUACULTURE ECOLOGY BIODIVERSITY BEHAVIOUR  
 OYEN, CRAIG FOSSIL-ECHINOIDS COMATULID-CRINOIDS BIOSTRATIGRAPHY CENOZOIC FLORIDA  
 PABIAN, ROGER CRINOIDEA-EPIBIONTS PARASITES PREDATORS COMMENSALS  
 PAGETT, RICHARD BRACKISH-WATER BRITTLESTAR-ECOLOGY CASPIAN SEA  
 PAIK, SANG GYU BENTHIC-ECOLOGY ASTERIAS-AMURENSIS  
 PALUMBI, STEVE ECHINOIDEA SPECIATION POPULATIONS-STRUCTURE MOLECULAR-EVOLUTION  
 PARDO ANGEL, ROBERTO ECOLOGY POPULATION-DYNAMICS ECHINOIDEA OPHIUROIDEA  
 PARMA, SARA GRACIELA PALEOBIOGEOGRAPHY ECHINOIDEA MESOZOIC-CENOZOIC  
 PARSLEY, RONALD ANKYROIDS CORNUTES STYLOPHORA HOMALAZOEA CYSTOID-groups  
 PAULS, SHEILA MARQUES TAXONOMY ECOLOGY MORPHOLOGY  
 PAYNE, ADAM OPHIUROIDEA ECOLOGY PREDATION  
 PEARCE, CHRIS URCHIN CULTURE ENHANCEMENT PREPARED-FEEDS  
 PENCHASZADEH, PABLO ASTEROIDEA ECHINOIDEA HOLOTHUROIDEA NUTRITION REPRODUCTION  
 PEREIRA MAJER, A. HOLOTHUROIDEA APODA REPRODUCTION BEHAVIOR  
 PETR, VACLAV SYSTEMATICS TAXONOMY PALEOBIOLOGY PALEOECOLOGY BIOSTRATIGRAPHY  
 PETROVA, IRINA MORPHOLOGY  
 PHILIPPE, MICHEL ECHINOIDEA PALEOECOLOGY STRATIGRAPHY TAXONOMY  
 PIEPENBURG, DIETER ECOLOGY OPHIUROIDEA BIODIVERSITY  
 PODOLSKY, ROBERT REPRODUCTION FERTILIZATION LARVAL-BIOLOGY PHYSIOLOGY BIOCHEMISTRY  
 POMORY, CHRISTOPHER REGENERATION PHYSIOLOGICAL-ECOLOGY TAXONOMY  
 PORTELL, ROGER ECHINOIDEA ASTEROIDEA TAXONOMY BIODIVERSITY  
 PROKOP, RUDOLF JAN EARLY-PALAEOZOIC-ECHINODERMATA BIOSTRATIGRAPHY PALEOBIOLOGY  
 PUTCHAKARN, SUMAITT TAXONOMY ECOLOGY BIODIVERSITY  
 QUEVEDO, RUY HOLOTHUROIDEA REPRODUCTION CULTURE  
 RAJAKUMAR, C. BIOLOGY ECOLOGY  
 RAM MOHAN, M. HOLOTHUROIDEA TAXONOMY REPRODUCTIVE-BIOLOGY  
 RANNER, HERWIG *Asterias rubens* CLIMATE-RECORDER GLOBAL-CHANGE  
 REGIS, MARIE-BERTHE BIOLOGY ECOLOGY POLLUTION ENVIRONMENT  
 REGNAULT, SERGE MORPHOLOGY ONTOGENY SYSTEMATICS PALEOBIOGEOGRAPHY PALEONTOLOGICAL-PATRIMONY  
 REICH, MIKE TAXONOMY MORPHOLOGY EVOLUTION FOSSIL-HOLOTHUROIDEA OPHIOCISTIOIDEA  
 REMPALA, ERIN ASTEROIDEA EVOLUTION SYSTEMATICS  
 RINELLI, PAOLA BIOGEOGRAPHY ECOLOGY BIODIVERSITY  
 RINGVOLD, HALLDIS ASTEROIDEA TAXONOMY DISTRIBUTION  
 ROBERTS, SARAH MARINE-BIOLOGY ECHINODERMS  
 ROBINSON, SHAWN SEA-URCHINS CULTURE ENHANCEMENT FISHERY ECOLOGY LARVICULTURE *Strongylocentrotus*  
 ROCCATAGLIATA, A. ASTEROIDEA OPHIUROIDEA PHYSIOLOGICALLY-ACTIVE-STERIODS  
 RODRIGUEZ, SEBASTIAN ECHINOIDEA ECOLOGY SPATIAL-DISTRIBUTION USE-OF-DRIFT-ALGAE  
 ROGERS-BENNETT, L. ECHINOIDEA GROWTH  
 ROSE, EDWARD FOSSIL ECHINOIDEA  
 ROTHENBERGER, PAIGE REEF-ECOLOGY  
 ROTMAN CLARK, HELEN ASTEROIDEA TAXONOMY ANATOMY  
 ROUX, MICHEL CRINOIDEA TAXONOMY ECOLOGY BIOGEOGRAPHY  
 ROWE, FRANK ECHINODERMATA SYSTEMATICS ZOOGEOGRAPHY EVOLUTION  
 ROY, MICHAEL EVOLUTIONARY-GENETICS CONSERVATION-GENETICS PHYLOGEOGRAPHY MARINE-SPECIATION  
 RUBILAR, TAMARA HUMAN-AIDED-MARINE-INTRODUCTIONS NEW-ZEALAND-FIORDS  
 RUENGSAWANG, NISIT ASTEROIDEA ASEXUAL-REPRODUCTION BIOCHEMISTRY  
 RUSSELL, MICHAEL ECOLOGY  
*Strongylocentrotus*-FISHERIES-MANAGEMENT GROWTH MORTALITY LIFE-HISTORY RESOURCE-ALLOCATION  
 LARVAL-ECOLOGY

SABA, MASAKI	ASTEROIDEA TAXONOMY
SADLER, KIRSTEN	STARFISH MEIOSIS
SAHA, APURBA KUMAR	ASTEROIDEA
SALAMON, MARIUSZ A.	CRINOIDEA TRIASSIC
SAMYN, YVES	TAXONOMY FEEDING-BIOLOGY REPRODUCTIVE-BIOLOGY HOLOTHUROIDEA ECHINOIDEA-REGULAR
SANFORD, ERIC	ECOPHYSIOLOGY ECOLOGY BIOGEOGRAPHY ASTEROIDEA
SANO, MINORU	ECHINOIDEA POPULATION-ECOLOGY
SANTILLAN, AUGUST	ASTEROIDEA GROWTH
SANTOS, JOCO FARIA	ECHINOIDEA
SASTRY, DWADASI	TAXONOMY ECOLOGY ECHINODERMATA CORAL-REEFS SYMBIONTS
SAUCEDE, THOMAS	PRIMITIVE-IRREGULAR-SEA-URCHINS
SCALLY, KEVIN	MASTECATORY-FUNCTION ECOLOGY DENTAL-MORPHOLOGY EVOLUTION
SCHEIN, JASON	ECHINOIDEA
SCHELTEMA, RUDOLF	LARVAL-DISPERSAL MODE-OF-REPRODUCTION
SCHOPPE, SABINE	OPHIUROIDEA SEA-CUCUMBER-FISHERY INTERSPECIFIC-RELATIONSHIPS
SCHUETZ, ALLEN	REPRODUCTIVE-PHYSIOLOGY MEIOSIS OOCYTE-MATURATION HORMONAL-REGULATION
SCHUHMACHER, HELMUT	TAXONOMY ECOLOGY BIOEROSION
SCHULTZ, HEINKE	BROODING-SCHIZASTERIDS TAXONOMY BIOLOGY ECOLOGY
SEETO, JOHNSON	TAXONOMY REPRODUCTION
SERAFY, D. KEITH	ECHINOIDEA TAXONOMY LIFE-HISTORY AGE/GROWTH-STUDIES ZOOGEOGRAPHY
SEVASTOPULO, GEORGE	PALEONTOLOGY PHYLOGENY FUNCTIONAL-MORPHOLOGY CRINOIDEA
SEWELL, MARY	HOLOTHUROIDEA BIOGEOGRAPHY LARVAL-ECOLOGY LARVAL-DEVELOPMENT REPRODUCTION
SHEPHERD, SCORESBY	ECHINOIDEA CULTURE
SHICK, J. MALCOLM	PHYSIOLOGY PHOTOBIOLOGY BIOCHEMISTRY DEVELOPMENT
SHIRLEY, THOMAS	CRAB-ASTEROID-INTERACTIONS
SIBUET, MYRIAM	TAXONOMY BIODIVERSITY
SINGLETARY, ROBERT	ECOLOGY TAXONOMY
SKOLD, MATTIAS	OPHIUROIDEA REGENERATION DEVELOPMENT
SLOAN, NORMAN	HOLOTHUROIDEA FISHERIES
SMILEY, SCOTT	HOLOTHUROIDEA PHYSIOLOGY DEVELOPMENT EVOLUTION
SMIRNOV, ALEXEI	TAXONOMY ZOOGEOGRAPHY EVOLUTION PHYLOGENY PALEONTOLOGY HOLOTHUROIDEA
SMIRNOV, IGOR	POLAR-OCEANS OPHIUROIDEA DATABASES
SMITH, ANDREW	ECHINOIDEA PHYLOGENY
SMITH, L. COURTNEY	URCHIN-MOLECULAR-IMMUNOLOGY-EVOLUTION-COMPLEMENT
SMITH, MICHAEL	MOLECULAR-PHYLOGENETICS LARVAL-LIFE-HISTORY-STRATEGIES
SOLANDT, JEAN-LUC	<i>Diadema</i> HERBIVORY CORAL-REEFS
SOLIS-MARIN, FRANCISCO	ECOLOGY MOLECULAR-TAXONOMY NORTH-ATLANTIC HOLOTHUROIDEA ECHINOIDEA OPHIUROIDEA
	TAXONOMY SYSTEMATICS
SOLOVJEV, ANDREY	ECHINOIDEA EVOLUTION PALEOECOLOGY
SONNENHOLZNER, JORGE	ECHINOIDEA ECOLOGY DISEASE IMMUNE-RESPONSE
SOUSA, RUI	OPHIUROIDEA ECOLOGY BIODIVERSITY
SPENCER, LARRY	POPULATION-ECOLOGY SYMBIOTIC-RELATIONSHIPS LIFE-HISTORY-STUDIES
SPIRINA, IRINA	MORPHOLOGY REGENERATION HOLOTHUROIDEA
SPIRLET, CHRISTINE	SEA-URCHIN ECHINICULTURE REPRODUCTION GONAD-GROWTH
SPONER, RENATE	EVOLUTION GENETICS BIODIVERSITY BIOGEOGRAPHY
STANCYK, STEPHEN	OPHIUROIDEA REGENERATION PREDATION POPULATION GROWTH
STARMER, JOHN	OPHIUROIDEA TAXONOMY BIOGEOGRAPHY SYMBIOSIS-(with octocorals)
STEWART, BRIAN	OPHIUROIDEA REPRODUCTION ANATOMY PHYSIOLOGY
STICKLE JR., WILLIAM	PHYSIOLOGY TOLERANCE ASTEROIDEA
STOCK, STUART	X-RAY-MICROTOMOGRAPHY X-RAY-DIFFRACTION MICROSTRUCTURE
STOCKLEY, BRUCE	PHYLOGENETICS SPATANGOIDA
STOHR, SABINE	OPHIUROIDEA BIODIVERSITY PHYLOGENY
STORC, RICHARD	OPHIUROIDEA ASTEROIDEA TAXONOMY CRETACEOUS
STRATHMANN, RICHARD	LARVAE EVOLUTION BODY-PLANS
STUMP, RICHARD	CELL-BIOLOGY LIFE-HISTORY POPULATION-DYNAMICS AGE-DETERMINATION
SU, XIAOWEI	SEA-URCHIN-SPINE NATURAL-COMPOSITES
SUMRALL, COLIN	PHYLOGENY SYSTEMATICS PALEOECOLOGY EDRIOASTEROID
SUTER, SHERMAN	ECHINOIDEA PALEOBIOLOGY
TABLADO, ALEJANDRO	ASTEROIDEA TAXONOMY SOUTH-ATLANTIC
TAHERA, QASEEM	TAXONOMY BIODIVERSITY ECOLOGY LARVAL-DISTRIBUTION
TAKAHASHI, KEIICHI	MUSCLE-PHYSIOLOGY SPERM-MOTILITY CONNECTIVE-TISSUE
TALBOT, TIFFANY	OPHIUROIDEA REPRODUCTION DEVELOPMENT BEHAVIOR FUNCTIONAL-MORPHOLOGY
TAVARES, YARA A.	ECHINOIDEA ECOLOGY REPRODUCTION BIOCHEMISTRY ALLOCATION-OF-RESOURCES HISTOLOGY FEEDING
THANDAR, AHMED	TAXONOMY BIODIVERSITY SYSTEMATICS ZOOGEOGRAPHY REPRODUCTIVE-BIOLOGY EVOLUTION
	HOLOTHUROIDEA
THAPANAND, THANITHA	POPULATION-DYNAMICS fish and invertebrates



THIERRY, JACQUES MORPHOLOGY MORPHOMETRY SYSTEMATICS TAXONOMY PALAEOECOLOGY PALAEOENVIRONMENTAL-LINKS  
 EVOLUTION BIOSTRATIGRAPHY PALAEOBIOGEOGRAPHY  
 THORNDYKE, MICHAEL NEUROBIOLOGY REGENERATION DEVELOPMENT  
 THORSEN, MARIANNE ECHINOIDEA GUT-MICROBIOTA  
 TIAGO, CLAUDIO BIOLOGY ECHINODERMS  
 TOMAS, FIONA ECHINOIDEA ECOLOGY PARACENTROTUS-LIVIDUS  
 TOMINAGA, HIDEYUKI BRITTLE-STAR SEXUAL-DIMORPHINISM DEVELOPMENT SAND-DOLLARS-(as-their-host) TAXONOMY  
 TOMMASI, LUIZ ROBERTO OPHIUROIDEA SYSTEMATICS ANTARCTICA PALAEOBIOGEOGRAPHY BIOGEOGRAPHY  
 TRONCOSO, JUAN TAXONOMY ANTARCTIC  
 TURNER, RICHARD SYSTEMATICS MORPHOLOGY REPRODUCTION PHYSIOLOGICAL-ECOLOGY  
 TURON, XAVIER REPRODUCTIVE-BIOLOGY RECRUITMENT POPULATION-DYNAMICS ECOTOXICOLOGY  
 TUTERA, PETER TAXONOMY BIODIVERSITY CONSERVATION  
 UBAGHS, GEORGES LOWER-PALAEOZOIC-ECHINODERMS CRINOIDS CARPOIDS  
 UTHICKE, SVEN HOLOTHUROIDEA POPULATION-GENETICS ASEXUAL-REPRODUCTION INTERACTIONS-WITH-ENVIRONMENT  
 UY, FREDERICK ECOPHYSIOLOGY ECHINOIDEA  
 v.JUTERZENKA, KAREN OPHIUROIDEA ARCTIC-ECHINODERMS-ECOLOGY FEEDING-STRATEGIES POPULATION-DYNAMICS  
 VADAS, ROBERT GRAZING BEHAVIOR REPRODUCTIVE-ECOLOGY  
 VADET, ALAIN ECHINOIDEA JURASSIC TAXONOMY  
 VALENTINE, JOE ECHINOIDEA ECOLOGY  
 VALENTINE, JOHN OPHIUROIDEA ECHINOIDEA ECOLOGY  
 VAN DER HAM, RAYMOND ECHINOIDEA CAMPANIAN-MAASTRICHTIAN-DANIAN NW-EUROPE TAXONOMY  
 VAN HOUT, TESSA ECOLOGY DISTRIBUTION BEHAVIOUR BIO-EROSION  
 VANDENSPIEGEL, DIDIER DEFENSIVE-MECHANISMS MORPHOLOGY SYMBIOSIS  
 VANDERKLIFT, MAT ECOLOGY ECHINOIDEA  
 VAROTTO, RICARDO TAXONOMY ECOLOGY PHYSIOLOGY  
 VEATCH, STEVEN ECHINOIDEA FOSSILS  
 VEGA, JUAN TORRES OPHIUROIDEA ECHINOIDEA SYSTEMATICS  
 VELARDE, RONALD TAXONOMY DISTRIBUTIONAL-ECOLOGY SYMBIOTIC-RELATIONSHIPS  
 VENTURA, CARLOS REPRODUCTION ASTEROIDEA  
 VERLING, EMMA ECHINOIDEA ASTEROIDEA BEHAVIOUR ECOLOGY NICHE-PLASTICITY  
 VIADA, STEPHEN TAXONOMY BIODIVERSITY BIOGEOGRAPHY  
 VICKERY, MINAKO ASTEROIDEA MOLECULAR-PHYLOGENY  
 VIKTOROVSKAYA, GALINA REPRODUCTION INVERTEBRATES BIOTIC-ABIOTIC-CONDITIONS  
 VILLALOBOS, FRANCISCO TAXONOMY BIOGEOGRAPHY ECOLOGY  
 VILLIER, LOIC ASTEROIDEA SPATANGOIDA TAXONOMY PHYLOGENY  
 VISTISEN, BODIL OPHIUROIDEA  
 VOLBEHR, UTE ECOLOGY  
 von BRAND, ELISABETH HOLOTHUROIDEA CYTOGENETICS POPULATION-GENETICS  
 WALKER, CHARLES SEASTAR SEA-URCHIN GAMETOGENESIS ULTRASTRUCTURE SIGNAL-TRANSDUCTION-PATHWAYS VITELLOGENIN  
 MAP-KINASE STEROIDS c-myc p53 c-ras LAND-BASED-AQUACULTURE SBIR  
 SEA-URCHIN LARVAL-CULTURE LYTECHINUS-VARIEGATUS  
 WALLACE, BRENDA ASTEROIDEA EVOLUTION MOLECULAR-BIOLOGY  
 WATERS, JONATHAN GROWTH REPRODUCTION NUTRITION PHYSIOLOGY HORMONES  
 WATTS, STEPHEN CRINOIDEA PALEOZOIC TAXONOMY PALEOBIOGEOGRAPHY  
 WEBSTER, GARY CRINOIDEA MORPHOLOGY NERVOUS-SYSTEM CONNECTIVE-TISSUE  
 WELSCH, ULRICH CRINOIDEA LARVAL-BIOLOGY TAXONOMY SENSORY-BIOLOGY  
 WHITE, CHRIS CRINOIDEA TAXONOMY PALAEOBIOGEOGRAPHY PHYLOGENY PALAEOZOIC  
 WIDDISON, ROSANNE REPRODUCTIVE-BIOLOGY POPULATION-GENETICS ECOLOGY HOLOTHUROIDEA  
 WIGHAM, BEN OPHIUROIDEA ECHINOIDEA FUNCTIONAL-MORPHOLOGY  
 WILKIE, IAIN POPULATION-GENETICS MOLECULAR-PHYLOGENY EXPRESSED-GENES  
 WILLCOX, MARK CHEMICAL-ECOLOGY LARVAL-BIOLOGY HERBIVORY LIFE-HISTORY  
 WILLIAMSON, JANE ZOOGEOGRAPHY AZORES  
 WIRTZ, PETER TAXONOMY SYSTEMATICS PHYLOGENY ECHINOIDEA CORAL-REEF DEEP-SEA  
 WOERHEIDE, GERT SPAWNING-BEHAVIOUR CORAL-REEF-OPHIUROIDS  
 WOODLEY, JEREMY EVOLUTION DEVELOPMENT PHYLOGENETICS  
 WRAY, GREGORY LARVAL-DEVELOPMENT BIOGEOGRAPHY  
 YAMAGUCHI, MASASHI METAMORPHOSIS ECHINOIDEA DEVELOPMENT  
 YANAGISAWA, TOMIO FISHERIES-MANAGEMENT  
 YANG, MEI-SUN MARINE-ECOLOGY MARINE-BIOLOGY  
 YEEMIN, THAMASAK HOLOTHURIA  
 YEVOKIMOV, ALEXANDR PHYLOGENY MORPHOGENESIS EMBRYOGENESIS  
 YOKOTA, YUKIO COLLAGEN EXTRACELLULAR-MATRIX ELM  
 YOSHIZATO, KATSUTOSHI PIGMENT CAROTENOIDS ECHINODERMATA FEEDING  
 ZADOROZHNY, PAVEL POPULATION-GENETICS LARVAL-DEVELOPMENT SOFT-SEDIMENT-ECOLOGY DEEP-SEA-INVERTEBRATES  
 ZAVODNIK, DUSAN TAXONOMY BIODIVERSITY ECOLOGY DISTRIBUTION  
 ZEIDLER, WOLFGANG TAXONOMY ASTEROIDEA  
 ZITT, JIRI TAXONOMY TAPHONOMY PALEOECOLOGY

## ☆☆☆ CURRENT RESEARCH ☆☆☆

ADAMS, SEREAN - Cryopreservation of gametes and larvae of the sea urchin *Evechinus chloroticus*.

ADDISON, JASON - Population genetics of *Strongylocentrotus drobachiensis*.

AGATSUMA, YUKIO - Population ecology of the sea urchins in southern Japan.

ALBI, YVONNE - Working on Cretaceous echinoids from the Santa Ana Mountains, southern California which have not been described before.

ALI, MOHAMED SAID M. - Study of some Jurassic and Cretaceous echinoids of Sinai, Egypt.

ALLEN, JOHN - Deep-sea benthos of the Atlantic.

ALLISON, WILLIAM - I am a coral reef ecologist, and so am generally interested in Echinoderms. I have however, a particular interest in all facets of the life and times of *Culcita spp*. I am looking into the taxonomy and ecology of the species in Maldives, with special interest in its feeding ecology; completing research on reef survey methods and the status of Maldivian reefs.

ALVA, VICTOR - Trophic ecology of benthonic suspension organisms.

ALVAREZ, LEONARDO RAMON - Review of the Echinoderms of the Atlantic coast of Colombia.

ANDACHT, TRACY - Studying the mechanism of dorsoventral polarity disruption and inhibition of fertilization envelope elevation by nickel chloride in the sea urchin embryo, *Lytechinus variegatus*.

ANDERSON, EDWIN - Hierarchic cyclic stratigraphy of the Lower Cretaceous' Purbeckian' facies in Southern Spain-Dorset-French Jura.

ANDERSON, OWEN - Commercial fisheries research and marine ecology; population biology of commercial species of sea urchins in New Zealand, and the collection and identification of shallow water and deep-sea echinoderms.

ANDERSON, ROLAND - An escape action of the asteroid *Poraniopsis inflata* in response to other sea stars.

ARAKAKI, YUJI - Taxonomy of the sea urchin, *Echinometra mathaei* and *E. oblonga*.

ARCHER, JEFFREY - Culture of echinoderms - holothurians and echinoids. Culture of reef fish and invertebrates for the aquarium trade.

ARONSON, RICHARD - Patterns of predation on echinoderms in time and space from the tropics to Antarctica.

ASHA, PAYIKAT - Breeding, seed production and sea-ranching of sea cucumber *Holothuria scabra*.

- AUSICH, WILLIAM - Early radiation and phylogeny of crinoids; Crinoid classification; Crinoid taphonomy; Lower Mississippian crinoid macroevolution
- BALHOFF, JAMES - Molecular evolution of gene regulation in Strongylocentrotid sea urchins.
- BALSER, ELIZABETH - Mechanisms of asexual reproduction in echinoderm larvae.
- BANGI, HELEN GRACE - Culture and management of the sea urchin *Tripneustes gratilla*; pilot testing of sea urchin grow-out culture in Bolinao, Pangasinan, Philippines.
- BARBOSA LEDESMA, ISRAEL FABRICIO - Taxonomic study of Mexican sea urchin, particularly Family Cidaridae species of *Hesperocidaris*.
- BARICCHI, ELISA - Studying locomotion in *Antedon mediterranea*.
- BARTSCH, ILSE - Epi- and endozoa of ophiuroids.
- BASCH, LARRY - Ecological consequences of sea otter recolonization on nearshore benthic communities and resources in Glacier Bay, Alaska.
- BAUER, JOHN - A morbid laboratory *Diadema antillarum* was recently discovered with flagellated protozoans in the coelomic fluid (along with phagocytic coelomocytes). Studies are now being conducted to culture the flagellates and to trace the route(s) of the infection which led to the mortality.
- BAUMILLER, TOMASZ - Ecology and functional morphology of recent isocrinids; taphonomy of arms and stalks of articulates and advanced cladids vs. other Paleozoic taxa; Diversity of Permian and Triassic crinoids and effects of the P/T extinction; Patterns of turnover and extinction of Paleozoic crinoids; ecology of *Seirocrinus*; Borings in Paleozoic pelmatozoans.
- BAZHIN, ALEXANDER - Monitoring the condition of sea urchin populations (*Strongylocentrotus droebachiensis*, *S. polyacanthus*) along the Kamchatka peninsula shore.
- BEAVER, HAROLD - Fossil eggs in blastoids.
- BECKER, JOHANN - Marine invertebrates of Brazilian oceanic islands, including especially echinoderms.
- BEGBIE, KIRSTEN - Studies on the hyponeural nervous system of the brittlestar, *Ophiura ophiura*.
- BELL, BRUCE - Edrioasteroids
- BELL, MIKE - Trace fossils of ophiuroids and asteroids from Lower Cretaceous of Chile, South America. Evidence for Cretaceous echinoderm aggregation.
- BENAVIDES, MILENA - Epifauna of the continental shelf of the Caribbean and Pacific coasts of Colombia (300 to 500m).
- BENTLEY, ANDREW - Biology of the sand dollar, *Echinodiscus bisperforatus* along the southeastern coast of

South Africa, encompassing growth, reproduction, genetics, larval biology etc.

BERENTS, PENELOPE - Collection manager of Echinoderm collections.

BERGEN, MARY - The Southern Bight Pilot Project - a survey of soft bottom benthic communities between 10 & 200 m between Point Conception, California and the Mexican border.

BERTRAM, DOUGLAS - Evolution and ecology of modes of development in echinoids.

BIERMANN, CHRISTIANE - Population genetic structure in the circumantarctic sea urchin genus *Sterechinus*; Reproductive isolation and population genetics in the Strongylocentrotidae (Echinoida); amaro-dont phylogeny.

BILLETT, DAVID - Environmental impact on the deep sea; Taxonomy of the genus *Mesothuria* (Holothuroidea).

BIN ABDUL ADZIS, KEE ALFIAN - Biology of *Diadema setosum* at Tioman Island, Malaysia.

BIRENHEIDE, RUEDIGER - Aspects of aquaculture of sea urchins and sea cucumbers.

BIRKELAND, CHARLES - Coral reef management.

BIRYUKOVA, INGA - Chemoreception; chemosensory systems and its morphogenesis in the marine invertebrates.

BITTER, RICARDO - Characterizations and observations of the community of marine macroinvertebrates associated with *Thalassia* at the Morrocoy National Park. (Responsible Investigator) (Initiated in 2000).

BLACK, ROBERT - Recruitment and recovery from disturbances by *Echinometra mathaei* of Rottne-st Island, Western Australia (with Dr. Jane Prince).

BLAKE, DANIEL - The Triassic asteroid *Trichasteropsis* (with H. Hagdorn); The Carboniferous asteroid *Compsaster*; Early stelleroids from Utah (with T. Guensburg, J. Sprinkle, C. Sumrall).

BOCKELIE, JOHAN - Rhombiferan cystoids, Scandanavia.

BOCZAROWSKI, ANDRZEJ - Devonian Nonpelmatozoan Echinoderms (Ophiuroidea, Cyclocystoidea, Ophiocystioidea, Echinoidea, Holothuroidea) Mesozoic Nonpelmatozoan Echinoderms (Asteroidea, Ophiuroidea, Echinoidea, Holothuroidea) Triassic articulated ophiuroids from Poland.

BONASORO, FRANCESCO - regeneration of crinoids.

BORGES, MICHELA - Systematics and ecology of ophiuroids from southeastern Brazil.

BORRERO, GIOMAR - Taxonomy and distribution of echinoderms on the continental shelf from 300- 500 meters depth between Punta Gloria and Cape Tiburon (Caribbean coast of Colombia).

BORZONE, CARLOS - Matinhos sandy beach replenishment and its impact on the benthic macrofaunal

nearshore community; echinoderms of Parana's coastal waters, Brazil.

BOSCH, ISIDRO - UV effects on embryonic development of Antarctic and tropical echinoderms; Spawning periodicity of zebra mussels in New York's Finger Lakes.

BOUDOURESQUE, CHARLES - effect of the invasive introduced alga *Caulerpa taxifolia* on *Paracentrotus lividus*: population dynamics and diet; long term changes of *Paracentrotus lividus* (sea urchin) populations in a protected area and a non-protected area.

BOURGOIN, ALLAIN - studying the possibility of commercializing the green sea urchin *Strongylocentrotus drobachiensis* on the northeastern coast of New Brunswick.

BREGMAN, YURIY - Size-age structure & body growth studies of commercial sea urchins *Strongylocentrotus intermedius* and *S. nudus* at Japan Sea and Kuril Islands Coasts.

BRETON, GERARD - Asteroids and crinoids - Systematics, evolution - Cretaceous.

BREY, THOMAS - Antarctic Echinoids: diet, growth. Antarctic Ophiuroids: growth. Antarctic Asteroids: diet, population dynamics.

BROGGER, MARTIN - biodiversity of the South Atlantic Ocean invertebrates in the Buenos Aires province area; trophic ecology of primitive asteroids (*Astropecten* spps. and *Luidia* spps.)

BROWER, JAMES - Taxonomy, functional morphology, paleoecology, ontogeny and phylogeny of Ordovician crinoids and blastozoans from North America.

BUITRON-SANCHEZ, BLANCA - Cenozoic echinoderms (Stellerioidea and Echinoidea) from Baja California, Mexico.

BUNDRICK, CARLA - Defining range of amphiuroid brooding brittlestar from Monterey Bay and studying its development.

BURCH, BEATRICE - Working on foraminifera in gut of spatangoid echinoids of Hawaii (hopefully next spring with Rich Mooi).

BURNS, CASEY - Paleontology, paleoecology and taphonomy of the Tertiary echinoderms of the Pacific Northwest. A possible crinoid - cold seep association.

BUSSARAWIT, SOMCHAI - Taxonomic study of echinoderms from the Andaman Sea, west coast of Thailand.

BUSTOS ROJAS, HECTOR EDUARDO - Sea urchin culture, sea urchin farming improvement using artificial feed.

BYRNE, MARIA - Life history evolution, echinoderm reproduction and development, ophiuroid functional morphology, echinoderm fisheries.

CAMERON, R. ANDREW - A promoter trap strategy for finding embryonic gene regulatory regions in the sea urchin genome; The spatial expression of known patterning genes in sea urchin larval development; A micro-satellite analysis of homozygosity in an inbred line of sea urchins.

CAMPAGNA, SOPHIE - Stock assessment of the sea cucumber *Parastichopus californicus* in British Columbia. Field studies to test harvest rates and estimate biomass.

CAMPBELL, ALAN - Fisheries stock assessment, ecology of red sea urchins in British Columbia, Canada.

CAMPBELL, ANDREW - Coral reef/ echinoid relations; Taxonomy, systematics and ecology of diadematid echinoids; Distance chemoreception in echinoids and asteroids; Bioerosion by echinoids; Sea turtles.

CAMPBELL, DAVID - feeding behavior of *Asterias*.

CAMPOS-CREASEY, LUCIA - Taxonomy of holothurians from the northeast coast of Brazil.

CANDIA-CARNEVAL, M. DANIELA - Crinoid arm regeneration; Structure, physiology and biomechanics of complex musculo-skeletal systems (echinoid lantern, ophiuroid masticatory apparatus).

CANNON, LESTER - Senior Curator of Worms at Queensland Museum. Curatorial responsibility for Echinoderms.

CAREY JR, ANDREW - Ecology of mega-epifauna of Mendocino Ridge and papers on Arctic and deep-sea benthos.

CARROLL, DAVID - 1) Fertilization - signal transduction pathway leading to the initiation of calcium release. 2) Cloning and characterization of phospholipase C isoforms in eggs and early embryos of the starfish.

CASTRO, JOAO - Human predation on SW Portugal rocky shores: activities and impacts; Ecology of SW Portugal rocky shores: macrobenthic populations and communities.

CHANG, YA-QING - Sea urchin seed production and mariculture. Diets of sea urchin. Genetic breeding of sea urchin and sea cucumber. Sea cucumber culture.

CHAO, SHYH-MIN - Population dynamics of the shallow-water holothurians of Taiwan; Systematics of the echinoderms from Taiwan.

CHAVARRO, SONIA BEJARANO - Reef ophiuroid ecology, habitat preferences, species occupying sponges.

CHEN, CHANG-PO - Ontogenesis of skeletal plate patterns, gonad, and gonapores in the progenerative *Sinaechinocyamus mai*.

CHENUIL, ANNE - Consequences of developmental mode on the planctotrophic larva in spatangoids: from population biology to phylogenesis.

CHIA, FU-SHIANG - Retired - writing articles on environmental issues, particularly on marine environment.

CHICCA, ANGIE - Volunteer collector for Birch Aquarium at Scripps Institution of Oceanography.

CHRISTENSEN, ANA BEARDSLEY - Comparison of the respiratory physiology and hemoglobins of *Ophiactis rubropoda* and *Ophiactis simplex* (Echinodermata, Ophiuroidea); hypoxia tolerance in *Hemipholis elongata*.

CHUNHABUNDIT, SURAPHOL - Benthic assemblages; Coral reef restoration by the combination techniques for specific purposes.

CLARK, ROGER - Asteroidea of the Aleutian Islands, Alaska (especially genera: *Hippasteria*, *Solaster* and *Pteraster*); Echinoderms of Alaska; Deepsea echinoderms of the North American Pacific Coast (200-5000m).

CLEMENTS, LEE ANN - Effects of flow rate on skeletal regeneration in the burrowing brittlestar *Ophiophragmus filograneus*; Gene expression during arm regeneration in two infaunal brittlestars: *Microphiopholis gracillima* and *Ophiophragmus filograneus*; larval toxicology - the effects of sublethal Zn exposure on larvae of the sea urchin *Lytechinus variegatus*.

CLOUSE, RONALD - taxonomy and behavior of *Bohadschia marmorata* and *B. bivittata* (Holothuroidea) from Micronesia.

CONAND, CHANTAL - Holothurian fisheries (Indian Ocean, Madagascar); Asexual reproduction in sea cucumbers; Population biology of the sea urchin *Colobocentrotus atratus*; biodiversity of reef echinoderms (La Reunion).

COSTELLO, MARK - Developing a European Register of Marine Species (details at web site [erms.biol.soton.ac.uk](http://erms.biol.soton.ac.uk)).

CRUMP, ROBIN - Asteroid development and ecology.

CUENCA, CATHERINE - Sea urchins of the littoral Atlantic.

CUNHA DE JESUS, DORA MARIA - Seaweed harvest impact in echinoderm populations of SW coast of Portugal.

CUNNINGHAM, ADELE - Reproductive cycle of *Lytechinus variegatus*.

DAFNI, JACOB - Echinoid growth.

DALBY, JR., JAMES - Impact of aquaculture on benthic fauna, including echinoderms.

DARTNALL, ALAN - Fauna of port surveys in Australia.

DAUTOV, SALIM - Ultrastructure of the larval development of ophiuroids. Factors influencing on the distribution of the echinoderm larvae.

DAVIS, JENNIFER - For an Honours degree at the University of Newcastle, I am describing the invertebrate fauna that are associated with the sea urchin *Centrostephanus rodgersii* in various habitats in NSW, Australia. I am seeking to determine the types of association (if any) and whether the sea urchin provides important refuges

for these associated fauna. I am also interested in the implications of an expanding sea urchin fishery in NSW.

DAVOULT, DOMINIQUE - Ecology and functioning (carbon and nitrogen fluxes at the water-sediment interface) in coastal benthic communities with special reference to a dominant species, the ophiuroid *Ophiothrix fragilis* (Abildgaard); interactions between physics (hydrodynamism) and biology (suspension-feeding behaviour) for metabolism and recruitment.

DE RIDDER, CHANTAL - Symbioses in echinoids; food and feeding mechanisms in echinoids; taxonomy and biogeography of Antarctic echinoids.

DE WIT, WALTER - Fossil echinoderms in fluvial and ice-age deposits of Holland.

DEAN, JULIETTE - Ordovician divergence of asteroids and ophiuroids.

DEARBORN, JOHN - Identification manual for NW Atlantic ophiuroids; Gulf of Maine ophiuroid ecology; crinoids and ophiuroids of the Antarctic; functional morphology of ophiuroid podia.

DEHEYN, DIMITRI - Use of echinoderm bioluminescence in ecotoxicology.

DETWILER, PAUL - Population dynamics of echinoids, phenotypic plasticity and life history variation among ecotypes, echinoid/coral interactions, and microbial flora associated with echinoids.

DEVIN, MICHAEL - Developing commercial sea urchin culture techniques (Aquaculture).

DEWAELE, YANNICK - Nervous control of the luminescence on three luminous brittlestars. This year, I will try to patch-clamp on ophiuroid luminous cells.

DIEHL, WALTER - Effects of environmental stress on multilocus heterozygosity-growth relationships in invertebrates.

DOBSON, WILLIAM - Population biology of *Ophiura sarsi* on continental slope off North Carolina; Use of skeletal growth bands in ophiuroid ossicles as biological markers for sublethal predation and population ecology experiments.

DOLMATOV, IGOR - Regeneration mechanisms and their changes during individual development of echinoderms.

DOMINGUEZ, PATRICIO - Axial tomography and computerized 3D reconstruction of carapoids. This research is mainly focused on tunicate mitrates such as *Anatifopsis*, *Balanocystites*, *Jaekelocarpus*, *Peltocystis*. I am also still working on physics of the fivefold pattern and Cambrian and Ordovician fossils from Spain.

DONOVAN, STEPHEN - Caribbean fossil echinoderms:- Lower Miocene echinoderms of Jamaica - paper in preparation (with R.W. Portell); a Miocene astropectinid starfish from the Middle Miocene of Carriacou, the Grenadines - paper in preparation (with R.W. Portell, R.K. Pickerill & W. Lindsay); fieldwork for 2001 planned for Jamaica (May/June) and Carriacou (October). British Ordovician crinoids:- new camerate crinoids from the Ordovician of Britain (paper in preparation with N. Gilmour); unusual attachment structures of possible pelmatozoan origin (paper in preparation with J.C.W. Cope).



- DORNBOS, STEPHEN - Paleocology of helicoplacoids and other Cambrian suspension- feeding echinoderms (for Masters Thesis).
- DRUMM, DARRIN - Researching traditional holothurian fishery in the Cook Islands.
- DRUMMOND, ANNE - Intra and interspecific agnostic behaviour in echinoids; wave action and consequences for *E. mathaei*, *S. variolaris*, *D. savignyi*.
- DUPONT, SAMUEL - Bioluminescence in *Amphipholis squamata* (Echinodermata: Ophiuroidea): a suitable model for studying microevolution (for PhD thesis).
- EBERT, THOMAS - 1) Finishing work on growth and mortality of red and purple sea urchins (*Strongylocentrotus franciscanus* and *S. purpuratus*) along the west coast of North America. 2) The life- history consequences of the evolutionary timing of different modes of reproduction in ophiuroids.
- EBLE, GUNTHER - Evolutionary dynamics in disasteroids, holasteroids and spatangoids; post- metamorphic spatangoid development; phylogeny of disasteroids, early holasteroids and early spatangoids.
- ELISEIKINA, MARINA - Functions of echinoderms lectins.
- ELLERS, OLAF - Growth of sand dollar teeth; catch collagen.
- EMLET, RICHARD - Functional morphology of echinoderm larval evolution of echinoid life histories and development.
- ENTRAMBASAGUAS, LAURA DE - Biology, ecology and biogeography of the Cape Verde Island's echinoderms (including taxonomy).
- ESCRIBANO, MARGARITA - Working on early echinoderms, especially Ordovician *Diploporita* from Spain.
- ESTREMADURA, D.M. - Recruitment and settlement of holothurian larvae.
- ETNIER, SHELLEY - I am interested in the biomechanics of multi-jointed biological beams. Right now, I am investigating flexibility in dolphin backbones, particularly with respect to developmental changes in the biomechanics of this structure.
- ETTENSohn, FRANK - Middle Ordovician edrioasteroid firmground; Paleozoic stemless crinoids; Taxonomy, ecology, and functional morphology of the pelagic crinoid *Saccocoma*.
- EVDOKIMOV, VLADIMIR - Influence of ecological conditions on sea urchins ontogenesis in coastal communities.
- FARMANFARMAIAN, A. VERDI - Growth hormone and nitrogen retention.
- FAUVILLE, GERALDINE - The aim of my research is to determine the behaviour of *Amphipholis squamata* in the case of predation; also, to show the circadian rhythm of bioluminescence in *Amphipholis squamata*.

FAY, ROBERT - Ovachita Belt bibliography.

FEDER, HOWARD - The deep benthic environment in Port Valdez, Prince William Sound, Alaska; the feeding biology of the sea star *Pycnopodia helianthoides* in Prince William Sound, Alaska; the deep benthos in Prince William sound 16 months after the Exxon Valdez oil spill; the macrofauna (infauna and epifauna-- which includes large numbers of sea-star species) in the southeastern Chukchi Sea.

FERAL, JEAN-PIERRE - Structure of habitat and dispersal strategies; Effects of developmental modes on spatial and genetic structuring and on evolutionary processes (mainly in echinoids - annelids and molluscs also used).

FERGUSON, JOHN - Madreporite functions and water volume relationships in echinoderms - currently on echinoids and holothuroids.

FERNANDEZ, CATHERINE - Reproduction and population dynamic in lagoonal environment.

FERRAZ, ROGERIO - Scientific support to management of the small invertebrate resources of the Azores (RIVA).

FERRIER, DREW - Ophiuroid ecology (distribution, feeding and behavior).

FLAMMANG, PATRICK - Adhesion in echinoderms: An integrated study - biomechanical, morphological, molecular - of tube foot temporary adhesion, Cuvierian tubule adhesion, and larval fixation.

FOLLOSCO, MINDA - Artificial culture of economically important sea cucumber.

FONTANELLA, FRANK - A comparison of ossicle arrangement and morphology in *Echinaster sentus*, *E. spinulosus*, *E. paucispinus* from the western Atlantic and Gulf of Mexico and a yet undescribed species from the shallow waters from the Gulf of Mexico.

FOSTER, MERRILL - Ordovician echinoderms from western Virginia; Atlantic Ocean brachiopods; Antarctic and subAntarctic brachiopods; paleobiology of Pennsylvanian invertebrates in Illinois.

FOX, DAVID - Analysis of articulation in the arms of *Ophiocoma echinata* and *Ophiocoma wendti*.

FRANCOUR, PATRICE - Impact of introduced green alga *Caulerpa taxifolia* on *Paracentrotus lividus* recruitment.

FREEMAN, STEVEN - Relationships between macro-epibenthic faunas and the seabed. Mapping benthic distributions using acoustic ground discrimination systems and GIS. Patterns in the geographical distribution of Echinoderms and their association with habitat complexity.

FRONTANA URIBE, SARITA CLAUDIA - Taxonomic and distributional study of invertebrates from Clipperton Island, including echinoderms.

FRYE, BRIAN - Morphometrics project focussing on the sand dollars *Encope borealis* and *Encope californica*.

FUJITA, TOSHIHIKO - Biology of *Coscinasterias acutispina*; Ecology of Recent and fossil *Ophiura sarsii*; Ophiuroid's vertebrae (morphology, age determination); Taxonomy of ophiuroids and asteroids in Japanese and tropical Pacific waters; Biology of *Diadema* in coral reef area; Investigation and re-examination of Ludwig Doderlein's collection from Japan.

FUKUYAMA, ALLAN - Looking at recovery of intertidal invertebrates in Prince William Sound, Alaska following the 1989 Exxon Valdez oil spill and am particularly interested in molluscan and echinoderm assemblages and the contrast in recovery patterns between areas that were treated with hot-water, high pressure treatment with areas that were oiled and untreated.

GAGE, JOHN - Deep-sea biology: shelf-edge benthic fluxes, and sediment community dynamics; Deep-sea brittle star growth, spatial distribution and demographic modelling.

GAGNON, JEAN-MARC -Bioturbation by and foraging behaviour of deepwater echinoderms: Observations in mesocosms.

GALLEMI, JAUME - Cretaceous echinoids (Tethyan - worldwide); systematics, biostratigraphy and palaeoecology.

GALLEY, ELIZABETH - Reproductive responses of bathyal Antarctic echinoderms to the seasonal flux of surface derived phytodetritus.

GANDOLFI, SILVIA MARIA - Benthic community structure and feeding behavior of asteroids for a PhD program at the University of Sao Paulo, Brazil.

GARRISON, ROBERT - Designing and building a *Paracentrotus lividus* aquaculture research facility in Sardinia, Italy for a behavior, aquaculture and fishery enhancement program.

GEBRUK, ANDREY - Deep-sea holothurians (order Elasipodida and in part, Fam. Synallactidae).

GENTIL, FRANCK - Population dynamics of ophiuroid species in soft-bottom community of the English Channel.

GEORGE, SOPHIE - Maternal effects on larval growth and development of echinoderms; Morphological and behavioral responses of echinoderm larvae to salinity gradients.

GIBBS, BARBARA - Working on benthic sampling projects in the Florida Keys, Dry Tortugas, the northern Gulf of Mexico, and the Atlantic and Pacific coasts.

GIBSON, MICHAEL - Epibiont paleoecology of middle Paleozoic fossils; Cretaceous paleoecology; Taphonomy of Devonian fossils from Tennessee.

GIL CID, MARIA DOLORES - Cambrian and Ordovician echinoderms and trilobites from Spain; Palaeological aspects, morphology and function.

GINANOVA, TALIA - Muscle regeneration in holothurians.

- GIRASPY, D.A. BENI - Investigating the cultural aspects of the sea cucumber *Holothuria scabra* and sea urchin.
- GIUDICE, GIOVANNI - Regulation of heat shock protein (hsp) synthesis in sea urchin embryos; Apoptosis in sea urchin development; regulation of ribosomal RNA synthesis in sea urchin (*Paracentrotus lividus*) development.
- GIULIANO, LAURA - Studying sea urchin interspecific relationships. Particularly, I am interested in symbiotic and/or pathogenic bacteria colonizing the sea urchin (with special emphasis on *Paracentrotus lividus*, means species in the Mediterranean Sea), and any other kind of direct-indirect relations between bacteria and sea urchins (food during larval period, etc.).
- GLENN, KRITON - 1. Holocene sedimentation in the Penguin Deep NW Shelf Australia. 2. Plans of management, performance indicators and the scientific programs for Marine Protected Areas (Australia).
- GLUCHOWSKI, EDWARD - Fammenian crinoids of Poland. Muschelkalk crinoids in the Middle European Basin.
- GOGGIN, LOUISE - Biological control of the northern Pacific seastar; *Asterias amurensis* in Australian waters.
- GOLDBERG, ARTHUR - Investigating antiarthritic properties of echinoderms.
- GONGADZE, GURAM - Late Cretaceous and Paleogene echinoids of the Caucasus (classification, paleobiogeography, stratigraphy).
- GONZALEZ, DUNIA NATALIA - Studying echinoderms collected during the expedition CIOH-INVEMAR-SMITHSONIAN 1995.
- GONZALEZ PELAEZ, SERGIO SCARRY - Population biology of *Tripneustes depressus* (Agassiz) in the southern Gulf of California, Mexico (dissertation, in progress).
- GOODING, RICHARD - Animals associated with Caribbean diadematids; Animals associated with diadematid echinoids, worldwide.
- GORCHAKOV, IGOR - Studying *Asterias rubens* and other sea stars intraspecific relationships in the subpopulation of Northern Atlantic on different integrative levels. Specie boundaries and population structure.
- GRABOWSKY-KAALIA, GAIL - Seabird by catch mitigation study for the Western Pacific Regional Fisheries Management Council; Native Hawaiian plant seed germination studies.
- GREENSTEIN, BENJAMIN - Taphonomy of crown-of-thorns starfish; comparative taphonomy of caribbean reefs; Mode of formation of Pliocene shell beds.
- GREENWOOD, AMY - Species list of invertebrates in Irish waters between 200-2000 m depth.
- GROSJEAN, PHILIPPE - Land-based close cycle cultivation of *Paracentrotus lividus*. Size distribution and somatic growth of *P. lividus*, and its model.

GROVES, CATHY - *Heliaster* biogeography and systematics.

GUENSBURG, THOMAS - Edrioasteroids, early crinoids, paleoecology of echinoderms.

GUILLOU, MONIQUE - REPRODUCTION/RECRUITMENT: responses of sea-urchin population to environmental changes; BIODIVERSITY: seaweed-urchin interaction.

GURREA, ISIDRO - Echinoids from the Cretaceous and Cenozoic age, Mediterranean region (specifically Western Europe).

GUTT, JULIAN - Disturbance of polar benthic communities.

HADEL, VALERIA FLORA - Biology and ecology of echinoderms.

HAGEN, NILS - Sea urchin outbreak dynamics: ecological interactions in a macroparasite/sea urchin/kelp forest system. Echiniculture/closed cycle cultivation of sea urchins: Broodstock management, photoperiodic control of gametogenesis, growth, feeding, design of cultivation equipment.

HALL, ROSEMARY - Zinc is released into the environment by mining and industrial processes in concentrations that often exceed background levels by several orders of magnitude. When released into marine ecosystems, it binds to sediment and organic particles, and is accumulated by organisms from many phyla. Zinc is also a key element in the nervous system of many organisms, yet excess concentrations can cause severe damage or even death. Given the role of the nervous system in guiding regeneration in echinoderms, high concentrations of zinc in seawater may have negative sublethal effects evident in regenerating tissue.

I am testing the effects of zinc on ophiuroid regeneration in the brittlestars *Ophiothrix angulata* and *Amphipholis gracillima* by inducing autotomy and exposing brittlestars to varying concentrations of zinc. Effects on protein synthesis will be tested immunocytochemically by labeling regions of cell proliferation with bromodeoxyuridine. I will evaluate effects at the tissue level by measuring rate of regeneration, nerve extension, and tissue formation in arms of exposed animals. For further information, please visit <http://RosemaryHall.homestead.com/REHCurriculumVitae.html>

HAMEL, JEAN-FRANCOIS - I am currently working on the ecology of juveniles and adults of the tropical sea cucumber *Holothuria scabra* in the Solomon Islands, and on the northern sea cucumber *Cucumaria frondosa* in the St. Lawrence Gulf and Estuary, eastern Canada. My main fields of research include chemical ecology, reproductive biology, spawning, settlement and daily cycles (movement, feeding, etc.).

HAMMER, HUGH - Sea urchin growth and development.

HAMZA HASSAN, MOHAMED - Ecology and biology of echinoderms from Gulf of Suez - Red Sea.

HAND, CLAUDIA - Conducting stock assessments and biological studies for our local west coast species of sea cucumber, *Parastichopus californicus*, distribution, abundance and productivity.

HARPER, FIONA - Population genetics and hybridization of *Asterias rubens* and *A. forbesi*. *Asterias* phylogenetics.

HAUDE, REIMUND - Stratigraphy and constructional morphology of scyphocrinoids; Devonian and Carboniferous holothuroids; Lower Devonian echinoderms of Argentina.

HAVARDSSON, BJORGOLFUR - The effect of carotenes in feed and environmental temperature on the gonad color and gonad development of the sea urchin *Strongylocentrotus drobachiensis* (Mueller, 1776). The purpose of the experiment is to develop feed suitable for controlling the quality of the urchin gonad in echinoculture.

HEINZELLER, THOMAS - Comparative, mainly neuroanatomical, morphology (TEM, histochem.) of crinoids with special attention to milleri-, bourgeti- and cyrtocrinids; entoparasitic myzostomids of crinoids, mutual effects on host and parasite on an ultrastructural basis.

HENDLER, GORDON - Behavior and functional morphology of deep-sea ophiuroids; taxonomy of Okinawan ophiuroids (with S. Irimura); systematics and natural history of eastern Pacific ophiuroids.

HERDENDORF, CHARLES - Invertebrate fauna associated with deep-sea (>2000 m) shipwrecks; invertebrate fauna of New Zealand (North Island) estuaries and tidal flats; Brisingid fauna of North Atlantic Ocean; Echinoid (esp. sand dollars) invasion of New Zealand estuaries following diversion of freshwater inflow.

HERRINGSHAW, LIAM - Taxonomic and palaeobiological revision of Silurian asteroids, notably those from the Much Wenlock Limestone Formation of the Midlands and Welsh Borders. Also studying a problematic new species of crinoid from the same horizon.

HESS, HANS - New starfish from the Middle Jurassic (Bajocian) of northern Switzerland; Crinoid ossicles from the Lower Jurassic (Pliensbachian of Arzo, Switzerland); Remains of Saccocomids from the Upper Jurassic of Germany (Sieverts-Doreck collection, on loan from Stuttgart Museum).

HICKMAN, JR., CLEVELAND - Development of field guides for the identification of Galapagos marine invertebrate life.

HIGHSMITH, RAYMOND - Intertidal studies in Cook Inlet, Alaska.

HILBUN, NANCY - Echinoderms of Yucatan Peninsula, Mexico for masters thesis.

HILL, ROBERT - Composition of mechanical properties of sea cucumber muscle and connective tissue.

HOBERG, MAX - Investigating the feeding biology of the sea star *Pycnopodia helianthoides* from eel-grass habitats in oiled and reference sites from Prince William Sound following the Exxon Valdez oil spill.

HODGSON, ALAN - Spermatozoan morphology of *Patiriella*.

HOFFMAN, JENNIFER - Interactive effects of ultraviolet radiation and temperature in echinoid embryos; Variations in UV sensitivity among echinoid species and populations; Effects of and defenses against UV in echinoid embryos.

HOLTERHOFF, PETER - Late Paleozoic crinoid paleoecology and systematics; P-Tr extinction and eradication of the Crinoidea.

HOOPER, ROBERT - Aquaculture of *Strongylocentrotus drobachiensis*.

HORSTMAN, DEON - Starting to assess the mariculture potential of an indigenous sea urchin *Tripneustes gratilla* through laboratory rearing of early life history stages.

HOSHI, MOTONORI - Induction of acrosome reaction in starfish.

HOTCHKISS, FREDERICK - Echinoderm pentamerism; Teratology of sea stars; Paleozoic ophiuroid morphology, evolution and classification; Isolated ophiuroid vertebrae and ossicles, Devonian, Bohemia (with Petr and Prokop); new Canadian finds of Ordovician stelleroids (with D.M. Rudkin); ophiuroids from Upper Windsor Group, Mississippian, Nova Scotia (with P. von Bitter).

HOTTENROTT, SUSAN - Dissertation research on the phylogeny of the family Ophiolepididae using morphological features and perhaps sequences. Revision of the genus *Ophiomusium*.

HOWELL, KERRY - The ecology of deep sea asteroids including reproduction, zonation, abundance, distribution, diet and population genetics.

HUNTER, MARGARET - Maine green sea urchin fishery monitoring and assessment.

HUSEYINOGLU, FATIH - Changes in marine biodiversity among marine benthic invertebrate fauna in the Prince's Islands region, Istanbul.

ILAN, MICHA - The study of sponge chemical (and structural) defenses against echinoderm predators; echinoderms which live in association with sponges; the impact of coral reef sea urchins on corals recruitment.

IRIMURA, SEIICHI - Taxonomic study of Ophiuroidea based on the forms of vertebrae; SEM observation on disk granules of Ophiuroidea.

ISHIDA, YOSHIAKI - Taxonomy of Mesozoic and Cenozoic ophiuroids. Escape behavior and postures of extant and fossil ophiuroids after burial.

IVY, GRISILDA - Sea cucumber culture technology.

JABLONSKI, DAVID - Onshore-offshore and latitudinal patterns in the origins of higher taxa, and their subsequent shifts in environmental and latitudinal distribution; studying post-Paleozoic echinoids and stalked crinoids; studying mainly molluscan but some echinoid mass extinction and recovery patterns, especially at the Cretaceous-Tertiary boundary.

JACKSON, JENNIFER - I am studying evolutionary rates in irregular echinoidea and percomorph fish. This is a largely sequencing based project as I am combining evidence from many nuclear and some organellar genes from each group. This data can then be used to test a variety of systematic phylogenetic methods. Since the organisms in question have good fossil record data, we can create phylogenetic trees with numerous fossil-dated nodes and use these to detect evolutionary rate changes over time and in different lineages. This information can be used to look for correlations with life history characteristics such as organism metabolic rate and generation time. We can also check hypotheses about molecular clock behaviour and 'evolutionary explosions' where major species radiations have occurred in short periods to see if these are temporally accompanied by any rate changes.

JACOBSEN, NANCY - Identification and logging of occurrences of invertebrates, vertebrates and geologic features in the Monterey Bay; working especially with asteroidea analysis (WWW images and information will be available in the near future).

JAECKLE, WILLIAM - Nutrient distribution among tissue in planktonic larvae of echinoderms; Asexual reproduction by asteroid larvae; sites and mechanisms of nutrient assimilation by larvae.

JAGT, JOHN - Late Cretaceous crinoid/ophiuroid/asteroid lagerstätte (with S.K. Donovan et al.); paleoecology of crinoid *Dunnocrinus aequalis* (with S.K. Donovan et al.); taxonomy of Late Cretaceous astropectinid, benthoplectinid, goniasterid and pterasterid asteroids (with D.B. Blake, C. Mah, L. Villier, M. Kutscher, S.L. Jakobsen et al.); Cretaceous pterocomid comatulid, preserving tegmen and proximal arms, in collections of the Natural History Museum (London); taxonomy and preservation of Pliocene echinoid faunules from the Netherlands and NW Belgium (with E. Wille and J. Idema); update of Late Cretaceous echinoids from NW Germany, southern Belgium and Austria (with C. Neumann, L. Indeherberge, R. Meuris, R.W.J.M. van der Ham and A. Kroh); Late Maastrichtian holothurian faunules from the Netherlands (with M. Reich); Cretaceous ophiuroids from Japan (with Y. Ishida); Late Cretaceous-Early Paleogene asteroids/ ophiuroids from Denmark (with S.L. Jakobsen); Palaeogene echinoderm faunas from the Netherlands, outcrop and borehole material; Miocene astropectinids and asteroid trace fossils from the SE Netherlands (with R. Fraaye).

JAMES, DANIEL - Preparing a monograph on the holothurians of the seas around India.

JAMIESON, GLEN - Sea urchin abundance surveys; Near-shore community population dynamics.

JANIES, DANIEL - Phylogenetic analyses of the evolution of development among asteroids.

JEFFERIES, RICHARD - The phylogenetic relations between chordates, echinoderms and hemichordates (calcichordate theory).

JEFFERY, CHARLOTTE - Maastrichtian and Palaeocene echinoids; Larval strategy in recent and fossil Temnopleuroid echinoids.

JELL, PETER - Australian Palaeozoic echinoderms. Non-crinoid faunas of Australia, mainly asterozoans of Victoria but also including Mesozoic faunas and some Tertiary comatulids.

JEYABASKARAN, R. - Studies on biodiversity of west coast of India.

JOHNSEN, SONKE - Absorption spectra of echinoderm visual pigments.

JOHNSON, SHERI - Asterinid phylogeny.

JUNIO-MENEZ, ANNETTE - Culture and population genetics of marine invertebrates (sea urchin); Development of mass culture techniques for *Tripneustes gratilla*.

JUNQUEIRA, ANDREA - Population dynamics of echinoids.

KAMMER, THOMAS - Evolutionary paleoecology of Paleozoic crinoids, lithostratigraphy, biostratigraphy, and sequence stratigraphy of marine Mississippian rocks in the east-central United States.



- KASYANOV, VLADIMIR - Cellular mechanisms of reproductive strategies of marine invertebrates.
- KAWAUCHI, GISELE YUKIMI - Reproduction and dispersion - apodous holothurians
- KELLER, BRIAN - Echinoid ecology.
- KELLEY, L. SCOTT - Lower Cretaceous echinoid systematics; Cidaroid taxonomy.
- KELLY, MAEVE - Feasibility of commercial echinoculture in Scotland (*Psammechinus miliaris*); Echinoderm/subcuticular bacteria symbioses.
- KERR, ALEXANDER - Phylogeny of holothurian families; Phylogeny of the Holothuriidae; Evolution of habitat choice in holothurians.
- KINJO, SONOKO - Evolution of skeletal morphology of larvae in the family Echinometridae (Echinoidea).
- KLINGER, THOMAS - Digestion in echinoids, asteroids, and holothuroids; Population biology of tropical holothuroids; manufactured feeds suitable for the mariculture of echinoids.
- KOBAYASHI, NAOMASA - Marine pollution bioassay by using sea urchins; spawning periodicity of sea urchins; Effects of marine pollution upon sea urchin gonads.
- KOGO, ICHIZO - Class Crinoidea - taxonomy.
- KOGURE, YOICHI - Taxonomic and distributional study of ophiuroids and asteroids in the Japan Sea; Ecology of sand dollar *Scaphechinus mirabilis*.
- KRISHNARAJAH, PADMINI - Kinetic studies on carbohydrase enzyme of *Holothuria scabra*.
- KROH, ANDREAS - Oligo-Miocene echinoids of the eastern Mediterranean and the Paratethys.
- KYTE, MICHAEL - Puget Sound vacant benthic habitats.
- LAMBERT, PHILIP - New species of Holothuroidea from Pacific Northwest.
- LANDEIRA, ANA MARIA - Ca<sup>2+</sup> transport in sea cucumber smooth muscle.
- LANE, DAVID - Asteroid and holothuroid diversity and biogeography studies in the Indo-Malay Archipelago; Population studies of the goniasterid sea star *Iconaster longimanus*.
- LANE, N. GARY - Completing three papers on Famennian (latest Devonian) crinoids from China, Britain, and Germany.
- LAWLEY, JERRY - A quantitative survey of sea urchins on Enmedio Reef, Veracruz, Mexico.
- LAWRENCE, JOHN - Characteristics of arm regeneration in starfish; Nutrition and reproduction of sea urchins;

Life-history strategies of sea urchins and starfish.

LE MENN, JEAN - Paleozoic North-African crinoids (calyx and dissociated columnals); Benthic communities, polynomorphes and medium to high frequencies cycles.

LEE, YOUN-HO - Phylogenetic analysis of Korean east coast sea urchins; Phylogenetic analysis of the antarctic sea urchin, *Sterechinus neumayeri*; analysis of spicule matrix protein gene expression in sea urchin embryos.

LEFEBVRE, BERTRAND - Lower Palaeozoic (mainly Cambrian to Ordovician) primitive echinoderms (stylophorans, solutes, cinctans, ctenocystoids, eocrinoids) from northern margin of Gondwana (Bohemia, Spain, France, Morocco, Sardinia, Portugal) : Anatomy, ecology, functional morphology, phylogeny, biostratigraphy, palaeogeography.

LEISMAN, JULIANNE - Recruitment study of brittlestars in the Banana River; also, aspects of regeneration.

LELAND, AMANDA - My research addresses the question of how the green sea urchin affects coastal zone community structure in the Gulf of Maine via grazing pressure. Currently, I am working with sea urchin harvesters and the Dept of Marine Resources to determine if intense grazing pressure by large urchins can effectively reclaim suitable urchin habitat in areas that are depleted due to overharvesting. In addition, I am looking at grazing rates as a function of algae functional groups and for prominent local species as well as how grazing rates differ for urchins of different sizes and densities.

LESSER, MICHAEL - Molecular biology of photoperiod regulation of gametogenesis in sea urchins; Identification and transmission of bacterial symbionts in *Amphipholis squamata*.

LESSIOS, HARILAOS - Molecular biogeography of echinoids.

LEVIN, VALERY - Shallow water Holothuroidea; systematics, biology feeding and fisheries.

LEVITAN, DONALD - Ecological and evolutionary consequences of sperm limitation in echinoderms; Echinoid grazing pressure in the Caribbean.

LHEKNIM, VACHIRA - I am identifying the echinoderm holdings in the Prince of Songkla University collections. Most of the specimens come from student field trips to the Gulf of Thailand and Andaman Sea.

LIAO, YULIN - Fauna Sinica: Echinodermata: Ophiuroidea.

LINDSTROM, DAWN - Amount of predation on *Ophiocoma echinata* through the use of tethering experiments.

LITVINOVA, NINA - Compiling a Catalogue Ophiuroidea of the Institute of Oceanology.

LORDSON, JINBERT - Seed production and sea ranching of sea cucumbers.

LOVELY, ERIC - Coexistence of hydroid predators in *Tubularia larynx* colonies.

LYONS, KERRY - Management of commercial Green Sea Urchin fishery - Maine.

MACURDA, JR., D. BRADFORD - Mississippian crinoids.

MACZYNSKA, STEFANIA - Cretaceous and Tertiary echinoids particularly from Poland.

MAGSINO, RICHARD - I am currently looking into the genetic relationship of the color ecomorphs of the coral reef starfish *Linckia laevigata* in the Kalayaan Islands Group, South China Sea in western Philippines using both allozymes and DNA sequence of the COI genetic markers. I am also doing PCR-RFLP of the COI gene segment of the blue *Linckia laevigata* for individuals collected from the Palawan shelf and shoal reefs in the Philippines, and eventually compare it with allozyme data to determine the population genetic structure of this species.

MAHARAVO, JEAN - Study about proliferation of *Salmaciella erythraxis* in Ambaro Bay (Nosy-Be) Northwest coast of Madagascar.

MAIER, MARTA - Isolation and structural elucidation of secondary polar metabolites from echinoderms of the South Atlantic Ocean.

MALAY, MARIA CELIA - Population genetics of the sea urchin *Tripneustes gratilla*; Sea urchin fishery management / cage grow-out culture.

MALDONADO, ELISA - Study of ecology of deep-sea feather stars from the Bahama Islands (Smithsonian Institution with Dave Pawson). Study of ophiuroid parasites (Los Angeles County Natural History Museum with Gordon Hendler).

MALLEFET, JEROME - Luminescent ophiuroids; morphological, physiological, ecological aspects.

MANIKANDAN K.P. - I am working in a research and development company in the Maldives (Mais Marine Seacucumber Research Centre, Bandaveri, Raa Atoll, Republic of Maldives - \*no postal service). We in our research centre are trying to commercialize sea cucumber hatchery and growout. In our R&D Programme we have produced about 65,000 juveniles at 6% survival rate. From the start of my research career, I was fully interested in the embryology of sea cucumbers, particularly in *Holothuria scabra*. At present we have attained an increase in our survival rate from 5% to 15% without using sterilized seawater. We hope to increase it still more by using microbe-free-water. We are using different algal diets for its growth which to our excitement has affected greatly its metamorphosis and cycle duration. I am still carrying on my research by making sea cucumber hatchery and culture a commercial one in par with that of shrimpculture.

MANNI, RICCARDO - Morphological functionality of radial facets of the cyrtocrinids, Jurassic cyrtocrinids of central Italy.

MANNIFIELD, KAY - Dinantian crinoids from northwest Ireland; exploring Camerate ?extinction; Crinoid palaeoecology, autecology and palaeobiology; also looking at carbonate reefal environments etc.

MANSO, CYNTHIA L.C. - The echinoids from the middle Cretaceous of the Sergipe Basin (Brazil); Ophiuroids from the Brazilian coast.

- MAPLES, CHRISTOPHER - Devonian-Permian crinoid and blastoid paleobiogeography rebound from mass extinction; Late Paleozoic invertebrate paleoecology.
- MARAN, ALEKSANDRA - Palaeoecological research of Lower Cretaceous Echinoidea from eastern Serbia (YU); irregular echinoids, especially genus *Heteraster*, *Toxaster*, (Spatangoids) and *Holaster*, biostratigraphy, palaeoecology, taphonomy; Cretaceous echinoids from Serbia (YU); Lower Cretaceous echinoids (Urgonian) and accompanying macro and micro fauna; Lower Cretaceous foraminifers (Orbitolinids).
- MARCOS-DIEGO, CONCEPCION - Study of benthic fauna and flora from the southern of the Livingston Island (South Shetland, Antarctica).
- MARSH, LOISETTE M. - Echinoderms of the Dampier Archipelago, Northwestern Australia.
- MARTIN, RICHARD B. - Introduction and translocation of nonindigenous marine species; development of a marine pest information database; community detection of marine pest incursions.
- MARTINEZ, PRISCILLA C. - Population and reproductive biology of the sea cucumber *Isostichopus fuscus* in the Galapagos Islands.
- MARTINS DELBONI, CYNTHIA - Ossicle formation in apodous holothurians, specifically *Chiridota rotifera* and *Synaptula hydriformis*.
- MASCARENHAS, BERNARDO JOSE DE A. - Pattern of distribution of asteroidea from Guanabara Bay, Rio de Janeiro, Brazil.
- MASHANOV, VLADIMIR S. - Gut development in *Eupentacta fraudatrix*; Ultrastructure of the alimentary canal in holothurians; Regeneration of the digestive tube in holothurians; Ultrastructure of the radial nerve cord in holothurians.
- MASON, JOANNE - Reproductive behaviour of echinoderms.
- MASSIN, CLAUDE - Holothurian taxonomy; Indonesia, Malaysia, Madagascar.
- MASTROTOTARO, FRANCESCO - Benthic communities.
- MATA PEREZ, EUSTOLIA - Sea stars of the Family Luidiidae (Echinodermata: Asteroidea) from the coast of Mexico.
- MATERIA-ROWLAND, CHRISTINE - Developing a manual on coastal and marine monitoring; biological analysis and sediment chemistry analysis of the impact of the aquaculture industry on benthic fauna.
- MATTOS-SEGOVIA, ELIO - The assessment of bioinducers of the settlement in larvae of sea urchin *Loxechinus albus*.
- MAUBON, ROGER M. - Preparing inventories (or catalogs) of historical collections of Echinoderms in institutions like Museum of Nancy (Paul Thiery), Museum of Chambéry (Savin, Demoly) and Museum of La Rochelle; addendum (1998) to inventories (1994) of echinoderms in Grenoble, Museum of Natural History.

McALOON, KELLY - Trace metal solubilization by intestinal fluid of *Sclerodactyla briareus*.

McCLINTOCK, JAMES - Chemical ecology of echinoderms from the Gulf of Mexico and Antarctica.

McKENZIE, J. DOUGLAS - Subcuticular bacteria in echinoderms; antifouling mechanisms of echinoderms.

McLELLAND, JERRY - Identification and ecology of the local echinoderm fauna from the Gulf of Mexico and Caribbean areas.

McNAMARA, KENNETH - Neogene species of the clypeasteroid *Peronella* from Western Australia; Paleocene spatangoids from the Carnarvon Basin, Western Australia; Miocene echinoids from the Carnarvon Basin, Western Australia; Eocene echinoids from the Bremer Basin, Western Australia; fauna of Australia - spatangoids, holasteroids, clypeasteroids, cassiduloids (with Rich Mooi); general echinoid morphology, physiology and biogeography.

MEDEIROS-BERGEN, DOT - Selective constraints on brittlestar life histories.

MEIJER, LAURENT - Molecular mechanisms of cell cycle regulation, using starfish oocytes and sea urchin embryos as cellular models; circadian control of the cell division cycle; identification of novel anti-mitotic compounds, with potential anti-tumor activity, using mechanism-based screening assays (purified cell cycle regulating enzymes; detection of inhibitors of cell cycle regulating enzymes in extracts prepared from marine invertebrates (collaboration with Dr. G.R. Pettit, Cancer Research Institute, Arizona State University, Tempe, Arizona).

MELIKOV, OKTAY HAMZA - Investigation, evolutionary, systematic and development of orders Spatangoid, Holasteroid and Holoctypoid of Azerbaijan (late Cretaceous and Eocene)

MENDES, CARLA LIMA TORRES - Feeding ecology of *Echinometra lucunter*; feeding preference in relation to food availability in Cabo Frio region, Rio de Janeiro, Brazil.

MESSING, CHARLES - Systematics and phylogeny of comatulid crinoids.

MEYER, CHRISTIAN - Tertiary asteroids from the Eggenburg area (Austria); Fossilium catalogus Austriae, Part Asterozoa.

MILLER, ROBERT - Evolution and biogeography of the Elaspoda (Holothuroidea).

MIRONOV, ALEXANDER - 1) Taxonomy of the deep sea echinoderms (echinoids of the order Holasteroida, stalked crinoids of the suborder Bourgueticrinina, asteroids of the family Porcellanasteridae and holothurians of the family Myriotrochidae). 2) Biogeographical history of the deep sea echinoderm fauna.

MITROVIC-PETROV, JOVANKA - Upper Cretaceous echinoidea from western Serbia - taxonomy, paleoecology and paleobiogeography.

MLADENOV, PHILIP - Biology, ecology and population genetics of asexual echinoderms; parthenogenesis in echinoderms; population and evolutionary genetics of *Amphipholis squamata*; sea cucumber fisheries of the Cook Islands; ecology and systematics of New Zealand brittle stars.

MONTAGUE, CHRISTOPHER - Regeneration capabilities of sea stars in closed systems.

MOONEY, ROBERT - Red sea urchin (*Strongylocentrotus franciscanus*) management by the Hesquiaht First Nation: implications for community structure and the successful establishment of a commercial sea urchin fishery.

MOORE, ABIGAIL - Trying to set up a community-based project aiming to combine consensus-based local management of marine resources with various other initiatives to improve the economic and educational status of the villagers. This may be combined with trials of reef repair system and re-seeding of some species. Also possible involvement in one or more holothurian pen-culture projects for rearing juveniles to maturity before processing them.

MORGAN, ANDREW - Demography, life history and aquaculture of the temperate sea cucumber *Stichopus mollis*.

MORGAN, KATHERINE - Lecithotrophy in starfish; the evolution of developmental patterns and life cycle evolution.

MORRILL, JOHN - Experimental analysis of primary invagination in the sea urchin *Lytechinus variegatus*; Descriptive morphology of the embryonic development of the sea urchin *Echinometra lucunter*.

MOTOKAWA, TATSUO - Neuropeptides of echinoderms; Catch connective tissue.

MUKAI, HIROSHI - Community ecology of seagrass beds, including herbivorous sea-urchin grazing effects.

MUSA, NADIRAH - Histology of the sea cucumber.

NAIDENKO, TAMARA K. - Cryopreservation of sea urchin embryos and larvae bioassay by using sea urchin eggs and embryos.

NAKAI, SAORI - Echinoids of the family Temnopleuridae.

NATARAJAN, P. - Aquaculture, fish and shrimp culture, fish pathology; planning to implement echinoderm culture in India.

NEBELSICK, JAMES - Taphonomy of reef echinoids; Lower Miocene echinoid palaeobiogeography.

NEILL, BRUCE - Biogeography, systematics and population biology of echinometrids

NEPOTE, ANA CLAUDIA - As a graduate student from CICESE (Ensenada, Mexico), I am doing my thesis project on the Upper Gulf of California, Mexico. This area represents one of the few places in the world where the tidal range is around 7 m during low tides. The physical conditions in the Upper Gulf of California gives opportunity to study the processes that shape the assemblages of marine invertebrates communities.

NESTLER, HELMUT - Cretaceous echinoids from South Yemen; Isolated elements of maestrichtian crinoids.

NEUMANN, CHRISTIAN - Cretaceous deep-sea echinoids from Spain; Post-larval development of Cretaceous

hemiasterid echinoids; Origin of urchinid echinoids.

NICHOLS, DAVID - Reproductive cyclicity in the New Zealand crinoid *Oxycomanthus plectrophorum*; Seasonality in resource allocation in the English Channel starfish *Luidia ciliaris*.

NICOSIA, UMBERTO - Systematics and evolutive trends of Cyrtocrinids.

NISHIHARA, MORITAKA - Effect of heart urchins on coral community structure of the sandy bottom.

NISHIZAKI, MICHAEL - Fluid dynamic influences on the growth and survival of juvenile sea urchins (*Strongylocentrotus franciscanus* and *S. purpuratus*) - for MSc started Sept 1998 at University of Northern British Columbia.

NITHYANANDAN, MANICKAM - Working as a junior research fellow in Zoological Survey of India Chennai under the project "Survey & Inventorization of Marine Biodiversity of East Coast of India". Preparing checklist of echinoderms of east coast of India. Starfishes of Indian waters.

NOGUEIRA LIMA, RENATA PIRES - Reproductive cycle of the holothurian.

NOJIMA, SATOSHI - Feeding habits and effects of sea stars on benthic organisms.

O'CONNOR, BRENDAN - Bioturbation rates of infaunal echinoderms; Connection between hydrographic features and high density ophiuroid populations.

O'HARA, TIMOTHY - Echinoderms of Macquarie Island (final stages); Patterns of diversity for faunal assemblages on subtidal reefs off central Victoria (Ph.D. thesis, University of Melbourne).

OJEDA, F. PATRICIO - Ontogenetic changes in the diet of *Loxechinus albus*: an ecophysiological approach. Ecology of intertidal rockpools: role of sea urchins and fishes in determining community patterns.

OJI, TATSUO - Paleontology and biology of stalked crinoids; especially regeneration of crown and arms, and evolutionary history of isocrinines.

OLSZEWSKA-NEJBE, DANUTA - Studying the irregular echinoids in the North European Province; stratigraphy and paleobiogeography.

OLVER, JANE - Mesozoic irregular echinoids; extant British species.

ORTIZ, EDUARDO MORTEO - The history of artisanal fisheries of starfish in Baja California, Mexico (Echinodermata: Asteroidea) for a degree in Oceanology at the Autonomous University of Baja California, Mexico.

OTERO, MARIA DEL MAR - Energy partitioning, growth and reproductive strategies in a new aquaculture species, the green sea urchin *Psammechinus miliaris* (Ph.D. in progress).

OYEN, CRAIG - Cenozoic echinoid biostratigraphy and taxonomic descriptions (primarily in the Gulf and

Atlantic Coastal Plain areas of the U.S.). Fossil comatulid crinoid biostratigraphy and taxonomy in the same region. Biofacies and paleoecology interpretations of Cenozoic strata in Florida.

PABIAN, ROGER - Late Paleozoic crinoids, paleoecology, associated fauna and parasitic, prey and predation relations; biostratigraphy.

PADILLO, LOVELE - Asteroidea.

PAGETT, RICHARD - Caspian Sea: literature review.

PAIK, SANG GYU - Ecology of *Asterias amurensis*.

PARDO ANGEL, ROBERTO - Ecology and population dynamics of echinoderms (particularly echinoids and ophiuroids) - currently, population dynamics of sand dollars.

PARMA, SARA GRACIELA - Cretaceous and Tertiary echinoids from Patagonia and La Pampa Province, Argentina.

PARSLEY, RONALD - Reworking stylophoran phylogeny.

PAULS, SHEILA MARQUES - Distribution of the echinoids in coral communities.

PAYNE, ADAM - Studying the association between damselfish and brittlestars in Jamaica. I am especially interested in predatory and carrion feeding brittlestars and associations between the ophiuroids and other animals of different taxa and phyla.

PEARCE, CHRIS - Roe enhancement of the green sea urchin using prepared feeds. Juvenile grow-out strategies for the green sea urchin.

PENCHASZADEH, PABLO - Working on the diet of endemic starfish *Luidia* and *Astropecten* and the reproduction of the sea urchin *Pseudechinus* and the holothurian *Psolus*.

PENNINGTON, J. TIMOTHY - Primary production in the central California upwelling zone; brachiopod larvae of the Monterey Bay Submarine Canyon.

PEREIRA MAJER, ALESSANDRA - Reproductive and behavioral aspects of *Synaptula hydriformis* (Holothuroidea, Apoda) reared in laboratory.

PEREZ-RUZAFÁ, ANGEL - Wetlands and coastal lagoons of Galapagos Islands (Ecuador) - basis for its protection and management; Iberic fauna; study of benthic fauna and flora from the southern of Livingston Island (South Shetland, Antarctica); design of new algorithms for the primary productivity and water quality prediction in coastal zones using remote sensing techniques.

PETR, VACLAV - Preparation of a photographic, comprehensive book, "Atlas of Echinoderms of the Barrandian area". This book will be written in English and published at the end of 1998.

PETROVA, IRINA YU. - Structure and functions of echinoderms lectins.



PHILIPPE, MICHEL - Miocene echinoids.

PIEPENBURG, DIETER - Ecology of brittle stars in Arctic and Antarctic seas. Echinoderms of the Meteor Seamount.

PIZER, MARGARET - Evolution of echinoderm metamorphosis.

PODOLSKY, ROBERT - Evolution of life history characters in ophiuroid genus *Macrophiothrix*; Evolution of gamete characters in echinoid genus *Strongylocentrotus*.

PORTELL, ROGER W. - Echinoid biostratigraphy of Florida (especially undescribed Miocene taxa); Miocene echinoderms of Jamaica.

PROKOP, RUDOLF JAN - Devonian echinoderms from the Barrandian area; systematics, palaeoecology, biostratigraphy (together with V. Petr).

PUTCHAKARN, SUMAITT - Echinoderms associated with some sponges in coral reefs along the eastern coast of the Gulf of Thailand.

QUEVEDO, RUY - Reproduction and culture of sea cucumbers.

RAJAKUMAR, C. P. - Biology and ecology of certain Indian echinoderms; investigating the bioactive substances of Indian echinoderms.

RAM MOHAN, M. K. - Taxonomical studies of echinoderms.

RANNER, HERWIG - Marine echinoderms and bivalves and their potential as recorders of climate change (Ph.D. thesis in progress).

REGIS, MARIE-BERTHE - Population dynamics of regular echinoids in the Mediterranean; Enzymatic study of the nutrition of *Paracentrotus lividus* (Echinodermata: Echinoidea)

REGNAULT, SERGE E. - Echinoderms (Stylophora, Eocrinoidea, Cystoidea); Paleozoic; North Gondwana.

REICH, MIKE - Revision of the fossil holothurian parafamily Priscopedatidae Frizzell & Exline, 1956 (Ordovician-Quaternary) [in collaboration with Prof. Dr. H. Mostler, Innsbruck]; Silurian holothurians from the Isle of Gotland (Sweden); Campanian and Maastrichtian holothurians from Europe; fossil isolated calcareous ring elements of Holothuroidea (Palaeozoic and Mesozoic); Silurian ophiocistioids from the Isle of Gotland (Sweden) [in collaboration with M. Kutscher, Sassnitz].

REMPALA, ERIN - Jaw ossicle evolution in the asteroids; phylogenetic analysis of *Linckia*.

REY, DANIEL - Cretaceous and Tertiary echinoids of Spain.

RINELLI, PAOLA - National and international trawl-surveys projects (GRUND; MEDITS) for the evaluation of demersal resources (in which the macrobenthic fauna is studied with trawl net as well as grab and dredge).

- ROCCATAGLIATA, ALEJANDRO J. - Chemistry of physiologically active compounds isolated from starfishes and brittle stars in the South Atlantic Ocean.
- RODRIGUEZ, SEBASTIAN - Subtidal brown macroalgae forests as food sources for intertidal organisms: role in determining community patterns in the rocky intertidal environment.
- ROGERS-BENNETT, LAURA - Examining the impact of larval feeding history on the growth and success of newly settled red sea urchins; examining the survival of newly settled urchins exposed to micro-predators in the benthos; spatial patterns in the growth and survival of juvenile red abalone.
- ROSE, EDWARD P.F. - Jurassic irregular echinoids; Cenozoic holoctypoid echinoid *Echinoneus*.
- ROTHENBERGER, PAIGE - Studying coral reef ecology and the *Diadema* epizootic from 1983.
- ROTMAN CLARK, HELEN - Systematics of Southern Ocean asteroids.
- ROUX, MICHEL - Taxonomy, ontogeny, ecology of recent and fossil Articulata (Crinoidea).
- ROWE, FRANK - Indo-west Pacific echinoderms and their systematics and zoogeography; Indian Ocean echinoderms with A.C. Campbell.
- ROY, MICHAEL - Evolutionary history of *Amphipholis squamata*; Phylogeography and human influence in *Ophiactis savignyi* distributions; The effects of fiords on population structure of marine invertebrates; Developmental evolution of asteroids.
- RUSSELL, MICHAEL - Population biology, ecology and fisheries management of green sea urchins in the Gulf of Maine.
- SABA, MASAKI - Taxonomic studies of Japanese sea-stars.
- SALAMON, MARIUSZ ANDRZEJ - Triassic crinoids.
- SAMYN, YVES - Distribution and biodiversity of holothuroids along the Kenyan coast; feeding biology of commercial holothuroids from Kenya; reproductive biology of commercial holothuroids from Kenya; distribution and biodiversity of regular echinoids along the Kenyan coast.
- SANFORD, ERIC - Influence of water temperature on the physiology and community role of the sea star, *Pisaster ochraceus*.
- SANO, MINORU - Population ecology of *Strongylocentrotus nudus*.
- SANTILLAN, AUGUST - Studying the growth rate of the starfish *Oreaster nodosus* in the wild (in a marine reserve).
- SASTRY, DWADASI R.K. - Echinoderm fauna of Andaman and Nicobar Islands and their coral reefs.
- SAUCEDE, THOMAS - Apical system and primitive irregulars; systematic and plates structure in the family

Pourtalesiidae.

SCALLY, KEVIN - Tooth form function and evolution of invertebrate dental systems (in particular, echinoids), especially tooth sharpening behaviour (thegosis).

SCHEIN, JASON - The relationship between living echinoid populations and their skeletal remains in the sea-floor sediment, San Salvador, Bahamas.

SCHELTEMA, RUDOLF - Capacity of larvae to delay settlement, competence of larvae encountered in the open ocean to retain their capacity to metamorphose.

SCHOPPE, SABINE - Sea cucumber fishery in Philippines. Morphology and taxonomy of *Ophiactis spp.*

SCHUETZ, ALLEN - Mechanisms of hormone signal transduction on the starfish gonads.

SCHUHMACHER, HELMUT - Bioerosion on Red Sea coral reefs within the context of carbonate budget.

SCHULTZ, HEINKE - Identifying the Antarctic irregular echinoids housed in the Alfred-Wegener-Institute for Polar and Marine Research in Bremerhaven as a volunteer; cidarids, but mainly brooding schizasterids; also interested in other irregulars.

SEETO, JOHNSON - Taxonomy of Fiji echinoderms.

SERAFY, D. KEITH - Biogeography of Atlantic Ocean echinoids; Age and growth studies of *Echinarachnius parma*.

SEVASTOPULO, GEORGE - Functional morphology of *Pygmaeocrinus* (with Rudolf Prokop); Carboniferous microcrinoids from northwest Ireland; A new Carboniferous microcrinoid genus from Belgium; Late Tournaisian crinoid faunas associated with Waulsortian carbonate mounds.

SEWELL, MARY - Life-history and early development in echinoderms; Temperature effects on larval development; holothurian reproduction and ecology; larval physiology.

SHEPHERD, SCORESBY - Sea urchin culture.

SHICK, J. MALCOLM - Effects of UV on echinoid eggs and embryos; dietary accumulation of mycosporine-like amino acids by echinoids.

SHIRLEY, THOMAS - Predator-prey and competitive interactions between sea otters, crabs and starfish in Glacier Bay, Alaska.

SIBUET, MYRIAM - Deep sea ecology and deep sea echinoderms; Cold deep environments; Deep sea basins.

SKOLD, MATTIAS - The role of environmental factors in regulating sexual and asexual reproduction in sea stars. Genetics of sexual and asexual populations of the sea star *Coscinasterias muricata* around New Zealand. Population dynamics, growth, regeneration, feeding and predator-prey interactions in brittle stars. Structuring mechanisms in marine benthic populations; interactions between burrowing heart urchins (*Brissopsis lyrifera*)

and brittle stars (*Amphiura chiajei*). Ecotoxicology and fate of contaminants in marine environments, especially infaunal brittle stars.

SLOAN, NORMAN A. - Sea cucumber harvest on west coast of North America.

SMILEY, SCOTT - Annotated catalogue of holothurians with synonymies; Annual cycle of *Parastichopus californicus*, changing conditions of body wall muscles.

SMIRNOV, ALEXEI V. - Arctic echinoderms fauna; holothurians of the North Pacific; Taxonomy of apodid and molpadid holothurians.

SMIRNOV, IGOR S. - Taxonomic studies of arctic and antarctic ophiuroids, creation of illustrated computer key for arctic brittle-stars and data bases on ophiuroids of Arctic and Southern Oceans.

SMITH, ANDREW - Cretaceous echinoids (monography); Electronic Guide the Genera of Echinoidea.

SMITH, L. COURTNEY - Evolution of the deuterostome immune system; Immunity and cellular defense mechanisms in invertebrates; Sea urchin immunology.

SMITH, MICHAEL - Mitochondrial gene order and early deuterostome evolution; Molecular phylogenetics of larval life history strategies.

SOLANDT, JEAN-LUC - Exploring possibilities of funding toward using *Diadema* as a grazing 'tool' in deeper reef communities in order to restore >10m deep Jamaican (and possibly wider Caribbean) reefs to pre-hurricane coral dominated seascape. Research would involve movement of animals top deeper waters, coralling them and subsequently monitoring effects of their grazing at intermediate (8 per m square) densities.

SOLIS-MARIN, FRANCISCO - Ecology and molecular taxonomy of echinoderms in the North Atlantic (for Ph.D. program at Southampton Oceanography Centre, in progress).

SOLOVJEV, ANDREY - Holasteroid and spatangoid echinoids (evolution, classification, paleoecology); Echinoids on the Cretaceous/Paleogene boundary.

SONNENHOLZNER, JORGE - Systematic evaluation of the reef echinoderms at the Machalilla National Park, Manabi, Ecuador; Ecology of the sand dollar *Mellita longifissa* Michelin intertidally at the Machalilla National Park, Manabi, Ecuador.

SPENCER, LARRY - Symbiotic relationship between *Holothuria atra* and the polka-dot crab in the Hawaiian sublittoral zone.

SPIRINA, IRINA - Morphology and regeneration of respiratory trees in holothurians.

SPIRLET, CHRISTINE - Starting new project at Universite de Mons-Hainaut (Belgium) in September: Study of the impact of sand and gravel extraction on the coastal ecosystem, with emphasis on benthic organisms.

SPONER, RENATE - Molecular evolution of ophiuroids: phylogeny, phylogeography, population genetics in *Amphipholis squamata*, *Ophiactis savignyi*, *Ophiocoma scolopendrina*. (<http://www.dnapop.zi.ku.dk>)

- STANCYK, STEPHEN - Population biology, predation and regeneration of *Ophiura sarsi*; sublethal predation of echinoderms; Use of markers and growth rings of ophiuroid ossicles for age/growth studies.
- STARMER, JOHN - Annotated checklist of ophiuroid fauna of Guam; Additional ophiuroid records from Mauritius; Annotated checklist of ophiuroids from Palau; Population dynamics of *Tripneustes gratilla* in the micronesian country of Palau.
- STEWART, BRIAN - Reproductive biology of *Astrobrachion constrictum* and *Ophiopsammus maculata* (Echinodermata: Ophiuroidea); Growth rate and reproduction in *Stichopus mollis* (Echinodermata: Holothuroidea).
- STICKLE JR., WILLIAM - Effects of seasonal and latitudinal temperature variation on aerobic-anaerobic transitions in the *Leptasterias spp.* complex and the biological impact of the ciliated protozoan parasite, *Orchitophrya stellarum* on asteriid sea stars from the west coast of North America.
- STOCK, STUART - Structure of sea urchin teeth, lanterns, spines with noninvasive x-ray methods.
- STOCKLEY, BRUCE - The phylogenetics of Spatangoid sea urchins.
- STOEHR, SABINE - Diversity in tropical Ophiuroidea.
- STORC, RICHARD - Ophiuroids and asteroids from the Upper Cretaceous (Cenomanian- Turonian) of the Bohemian Cretaceous Basin (Czech Republic).
- STRATHMANN, RICHARD - 1. Effect of brooded and pelagic development on the evolution of embryonic cell cycle durations. 2. Effect of developmental allometry of larval ciliary bands on food-limited larval growth rates. 3. Anal suspension feeding by sea cucumbers (in collaboration with Will Jaeckle).
- STUMP, RICHARD - Population dynamics of *Acanthaster planci* (L.)
- SUMRALL, COLIN - Phylogeny of primitive Echinodermata; Edrioasteroid systematics; primitive echinoderm paleoecology.
- TABLADO, ALEJANDRO - Taxonomy of Asteroidea from Southwestern Atlantic; Intertidal ecology in rocky shores of Argentina.
- TAHERA, QASEEM - Prepared an "Illustrated key to the Echinoderms of Pakistan". (in press).
- TAKAHASHI, KEIICHI - Physiology of the madreporite; physiology of echinoid spine muscle and catch apparatus; motile mechanism of echinoderm sperm flagella.
- TALBOT, TIFFANY - Salinity tolerances and other factors of *Ophiophragmus filigraneus*.
- TAVARES, YARA APARECIDA GARCIA - Studying reproductive biology of echinoids (*Echinometra lucunter*, *Arbacia lixula* and *Lytechinus variegatus*), allocation of resources, biochemistry, feeding, sea urchin fishery monitoring.

- TELFORD, MALCOLM - Collagen in tooth support mechanism of clypeasteroids; Podial forces in *Asterias*; computer simulation of *Dendraster* distribution.
- THANDAR, AHMED - New species of holothuroid echinoderms from off KwaZulu-Natal coast; Revision of the holothuriid genus *Actinopyga* in the Indo-West Pacific region.
- THAPANAND, THANITHA - Population dynamics of fish and invertebrates of Thailand.
- THIERRY, JACQUES - Jurassic fossil irregular echinoids of North West European Peri- Tethyan platforms and basins.
- THOMAS, FLORENCE - Physical properties of echinoderm gametes. Effect of hydrodynamics on gametes and developmental stages.
- THORNDYKE, MICHAEL - Regeneration, neuronal development and regeneration, growth factors, gene-regulation of regeneration and response to environmental conditions.
- THORSEN, MARIANNE - The ecophysiology of the irregular sea urchin *Echinocardium cordatum* - interactions with gut microbiota.
- TIAGO, CLAUDIO - Biology of marine invertebrates, especially echinoderms.
- TIEFENTHALER, LIESL - Research on the red brittlestar *Amphiodia urtica*.
- TOMAS, FIONA - Biology and ecology of the sea urchin *Paracentrotus lividus* on *Posidonia oceanica* meadows.
- TOMMASI, LUIZ ROBERTO - Palaeobiogeography and modern biogeography of echinoderms in the South Atlantic and Antarctic regions (especially in Brazilian REVIZEE material - NE and SE Brazilian areas.
- TRONCOSO, JUAN - Identifying collections of Antarctic echinoderms in the Natural History Museum of Concepcion, Chile; studying several species of echinoderms from the Pacific coast Eight Region; the conservation problems of the echinoderms of Chile and their future projection.
- TURNER, RICHARD - Various projects on systematics and biogeography of echinoderms from the western Atlantic, all classes.
- TURON, XAVIER - Evaluation of sublethal impact of pollution on benthic invertebrates; Reproductive strategies of ascidians and echinoderms; Chemical defense mechanisms in sponges.
- TUTERA, PETER - Monograph of the irregular echinoids of Prydz Bay, Antarctica; new *Pachycentrotus* species.
- UBAGHS, GEORGES - New echinoderms from the Upper Cambrian of the Montagne Noire (southern France).
- URBINA BURGOS, MEDARDO - Revision of the species *Athyonidium chilensis*, especially anatomy and histology.

- UTHICKE, SVEN - Population genetics and stock size of commercially fished holothurians; asexual reproduction in holothurians.
- v.JUTERZENKA, KAREN - Ecology of Arctic ophiuroids and their function within the benthic food web (within the framework of AOSGE).
- VADAS, ROBERT - Ecology and reproductive biology of sea urchins along the coast of Maine. Funded by NOAA Sea Grant (1995-1997); temporal and spatial variability in reproduction and roe yield in green sea urchins. Tentatively funded by Maine Dept. Mar. Res. (1996-1997).
- VADET, ALAIN - Les oursins du Jurassique de France et des pays limitrophes : critères de détermination, répartition stratigraphique et géographique, variations en fonction du milieu.
- VALENTINE, JOE - Studying the interaction between a local sea urchin species and a recently introduced macroalga in subtidal waters (for PhD at the University of Tasmania).
- VALENTINE, JOHN - Continuing investigations of sea urchin herbivory and predation on sea urchins in the Florida Keys.
- VAN DER HAM, RAYMOND - *Hemiaster* and *Echinogalerus* of the Upper Cretaceous of NW Europe.
- VAN HOUT, TESSA - Distribution of *Echinothrix diadema* in Kenyan reefs.
- VANDENSPIEGEL, DIDIER - The defensive mechanism of the Echinodermata: structure and functions of the Cuvierian tubules.
- VANDERKLIFT, MAT - Ecology of sympatric sea urchins.
- VAROTTO, RICARDO - Growth of the irregular echinoid *Cassidulus mitis* (Cassiduloidea).
- VEGA, JUAN TORRES - Study of the echinoids and ophiuroids collected on the Campanas Oceanograficas Proibe I-II-III-IV-V.
- VELARDE, RONALD - Benthic infauna and trawl invertebrates of the Southern California Bight, taxonomy and distributional ecology (in conjunction with other monitoring agencies in southern California).
- VERLING, EMMA - Niche plasticity in echinoderms in Ireland - in particular, the asteroid *Marthasterias glacialis* and the echinoid, *Paracentrotus lividus*.
- VIADA, STEPHEN - Characterization study of the 'pinnacles' topographic features in the north central Gulf of Mexico.
- VIKTOROVSKAYA, GALINA - Reproduction of invertebrates in artificial and natural conditions.
- VILLALOBOS, FRANCISCO - Ecology of echinoderms.
- VILLIER, LOIC - Radiation of the genus *Heteraster* (Lower Cretaceous Spatangoida); taxonomy, phylogeny

and disparity (for Ph.D. dissertation). Also, taxonomic and phylogenetic revision of the family Stauranderasteridae (fossil Asteroidea).

VISTISEN, BODIL - Studying the two brittle stars *Ophiura albida* and *Amphiura filiformis* concerning their tolerance towards hypoxia with and without the presence of hydrogen sulphide.

WALKER, CHARLES - We are concerned with the normal and altered structure and function of tissues and genes in marine model organisms. Currently, we focus on manipulating gametogenesis of the green sea urchin for applications in land based aquaculture and on understanding leukemogenesis and the effects of antineoplastic drug therapies on leukemia in the softshell clam model for acute lymphocytic leukemia in humans.

The Sea Urchin Model - On the eastern coast of the United States, adult, green sea urchins (*Strongylocentrotus droebachiensis*) are the subject of a fishery for their ripe gonads. Unregulated harvesting has resulted in loss of productive beds and a projected collapse of the fishery. A suite of technologies exists for developing modular, land-based aquaculture ventures that depends on manipulating sea urchin genes relevant to the somatic and gametogenic cells within the gonads. In particular, the cDNA sequences for a major yolk protein (MYP) and for the transcription factor c-myc are important. Together with the urchin industry, we are using molecular procedures to produce urchins that are characterized by superior size, taste, color, texture and firmness.

WALLACE, BRENDA - Sea urchin larval culture - *Lytechinus variegatus*.

WAREN, ANDERS - Gastropods parasitic on echinoderms.

WATERS, JONATHAN - Molecular analysis of the fissiparous asteriid genus *Coscinasterias*.

WATTS, STEPHEN - Steroid biology in echinoderms; aquaculture of echinoids.

WEBSTER, GARY - 1) Continuing compilation of the bibliography and index of Paleozoic crinoids. 2) Devonian and Carboniferous crinoids of Iran (with Chris Maples). 3) Carboniferous crinoids of Algeria (with Chris Maples, Terry Frest, George Sevastopulo, and Johnny Waters). 4) Carboniferous crinoids of the western U. S. and SE Alaska.

WELSCH, ULRICH - Innervation of the juxtaligamental cells in crinoids; analysis of the connective tissue of crinoids.

WHITE, CHRIS - Crinoids.

WIDDISON, ROSANNE - Ph.D. dissertation (started 10/97) entitled, Palaeobiology of Silurian crinoids. Involves a complete taxonomic review of UK Silurian collections and establishment of crinoid communities in UK. Also looks at the variations in US and UK faunas.

WIGHAM, BEN - Reproductive biology, ecology and population genetics of Elaspodid holothurians from the NE Atlantic; influence of seasonal phytodetrital fluxes on changes in the structure of abyssal megafauna communities (for Ph.D. dissertation).

WILKIE, IAIN - Functional morphology and mechanics of the echinoid lantern; Functional morphology and mechanics of the ophiuroid mouth-frame; organisation, mechanics and physiology of echinoderm connective



tissues; autotomy mechanisms of echinoderms and other invertebrates.

WILLCOX, MARK - Molecular phylogeny of asteroids; genetic basis to salinity adaptation in asteroids.

WILLIAMSON, JANE - An autogenic shift in the response of the echinoid, *Holopneustes purpurascens*, to host plant chemistry (current Ph.D. at the University of New South Wales). Intense grazing by the sea urchin *Heliocidaris erythrogramma* on algal community structure (group project).

WIRTZ, PETER - Zoogeography of the area Azores to Sao Tome Island; Sea urchin behaviour; Writing a book (with about 1000 underwater photos) on eastern Atlantic invertebrates.

WOODLEY, JEREMY - The abundance of *Diadema* and *Tripneustes* on the fore-reef at Discovery Bay, Jamaica; Spawning behaviour of coral reef ophiuroids.

WRAY, GREGORY - We are working on a range of projects, most of which have to do with the evolution of development and life history in echinoderms. They include: (1) an analysis of the changing roles of key developmental regulatory genes in echinoderms, including differences in expression domains and function between echinoderms and other phyla and also the diversification of these features within echinoderms; (2) a phylogenetic analysis of the Asteroidea based on mitochondrial and nuclear sequence data; (3) a detailed analysis of the evolution of gene regulatory sequences (promoters and enhancers) for several echinoderm genes; and (4) a study of cell lineage and cell-cell interactions during the development of the adult rudiment in sea urchins.

YAMAGUCHI, MASASHI - Supervising a thesis on *Acanthaster planci*.

YANAGISAWA, TOMIO - Larval development from plutei to metamorphosis of the sea urchins in the Ogasawara (Bonin) Islands.

YANG, MEI-SUN - Fisheries management.

YOKOTA, YUKIO - Extracellular matrix and morphogenesis in the sea urchin; Phylogenetic analysis of yolk proteins in sea urchins and starfishes; Functions of vitellogenin and vitellogen in the sea urchin and starfish.

YOSHIZATO, KATSUTOSHI - Molecular evolution of invertebrate collagen.

YUND, PHIL - Fertilization processes, gamete toxicology, and the genetic differentiation of populations of *Strongylocentrotus drobachiensis*.

ZARDUS, JOHN - Population genetics of deep sea invertebrates, larval development and soft sediment ecology.

ZAVODNIK, DUSAN - Diversity, ecology and regional distribution of Adriatic Sea echinoderms.

ZITT, JIRI - 1. Lower Cretaceous crinoids of West Carpathians; crinoids and echinoids of the Bohemian Cretaceous Basin (late Cenomanian- early Turonian). 2. Asteroidea (Echinodermata) from the Upper Cretaceous of Bohemia (grant project starting in January 2001 and ending in December 2003).

☆☆☆ THESES AND DISSERTATIONS ☆☆☆

**BELGIUM**

**Ph.D. Dissertation**

Dimitri Deheyn. 1998. Study of bioluminescence in the ophiuroid *Amphipholis squamata* (Delle Chiaje, 1828) (Echinodermata): structure of photogenous sites; characteristics of expression and function of the bioluminescence. Free University of Brussels (ULB).

**BRAZIL**

**Ph.D. Dissertation**

Y.A.G Tavares. (in progress:2000-2004). Reproductive biology of three species of echinoids in different habitats at Parana's coastal waters (south Brazil). Universidade Federal do Paraná.

**ENGLAND**

**Ph.D. Dissertation**

Jennifer Jackson (in progress). Evolutionary Explosions and changes in molecular rates: testing molecular clocks against a known fossil record. University of Oxford.

**FRANCE**

**Ph.D. Dissertation**

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## **ECHINODERMS PAPERS PRESENTED AT MEETINGS AND CONFERENCES (By Conference)**

### **9th International Conference on Invertebrate Reproduction & Development Rhodes University, Grahamstown, South Africa on 15-20 July 2001**

<http://www.rhodes.ac.za/conferences/icird2001/>

Convener  
Professor Alan Hodgson  
Dept. Zoology & Entomology  
Rhodes University, Grahamstown, South Africa

Rubilar Panasiuk, C.T., Diaz de Vivar, M.E. & Pastor de Ward, C.T. - Reproductive cycle of *Allostichaster inaequalis* (Echinodermata: Asteroidea) from the Paragonian coast.

Lima, R.P.N., Barcellos, C.F., Ventura, C.R.R. & Campos-Creasey, L.S. - Reproductive cycle of the sea cucumber *Isostichopus badionotus* (Echinodermata) from Baia do Ilha Grande, Rio de Janeiro, Brazil.

Moreno, C. & Guisado, C. - Reproductive aspects of *Athyonidium chilensis* (Semper, 1860) (Echinodermata: Holothuroidea) in the IV region of Chile.

C. Conand, University of Reunion, Reunion, France. Comparison of reproductive strategies, sexual and asexual, in *Stichopus chlotonotus* (Holothuroidea) populations from the Great Barrier reef and Reunion Island.  
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J-F Hamel, College of the Marshall Islands, Marshall Islands. In vivo observation of ovulation and further

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M. Hoshi, Keio University, Japan. Species-specific induction of the acrosome reaction in starfish.

S.D. Kashenko, Institute of Marine Biology, Russian Academy of Sciences, Russia. Reactions of the sea cucumber *Apostichopus japonicus* larvae in different development stages after sharp desalination of surface water.

R.P.N.L. Lima, Universidade Santa Ursula, Brazil. Reproductive cycle of the sea cucumber *Isostichopus badionotus* (Echinodermata) from Baia de Ilha Grande, Rio de Janeiro, Brazil.

A. Mercier, College of the Marshall Islands, Republic of the Marshall Islands. Coelomic fluid as mediator of spawning induction in tropical holothurians. Poster

C. Moreno, Universidad Catolica del Norte, Chile. Reproductive aspects of *Athyonidium chilensis* (Semper, 1860) (Echinodermata: Holothuroidea) in the IV region of Chile. Poster

A. Rahman, Bangladesh Fisheries Research Institute, Bangladesh Experimental hybridization and gametic incompatibilities between two genetically divergent species of tropical sea urchins, *Echinometra mathaei* and *E. oblonga*. Paper

C.T. Rubilar, Universidad Nacional de la Paragonia San Juan Bosco. Reproductive cycle of *Allostichaster innaequalis* (Echinodermata: Asteroidea) from the Patagonian coast. Poster

M.A. Sewell, University of Auckland, New Zealand. Utilization of protein and lipid during larval development in two Antarctic echinoderms. Paper

J.S. Pearse, University of California, USA. Photoperiodic regulation of gametogenesis in the antarctic sea star *Odonaster validus* Koehler: Evidence for a circannual rhythm modulated by light. Paper

M. Whitaker, University of Newcastle, U.K. Nitric oxide and the ryanodine receptor pathway at fertilization in sea urchin eggs. Paper



**FOURTH NORTH AMERICAN ECHINODERM CONFERENCE, DARLING MARINE CENTER,  
UNIVERSITY OF MAINE, WALPOLE, MAINE, AUGUST 22-26, 2001.**

**THE ORGANIZING COMMITTEE**

Emma Creaser, Unity College in Maine

Kevin Eckelbarger, Director, Darling Marine Center

Isidro Bosch, SUNY Geneseo

John M. Lawrence, University of South Florida

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6TH ECE SIXTH EUROPEAN CONFERENCE ON ECHINODERMS  
 3-7 SEPTEMBER 2001  
 BANYULS-SUR-MER, FRANCE

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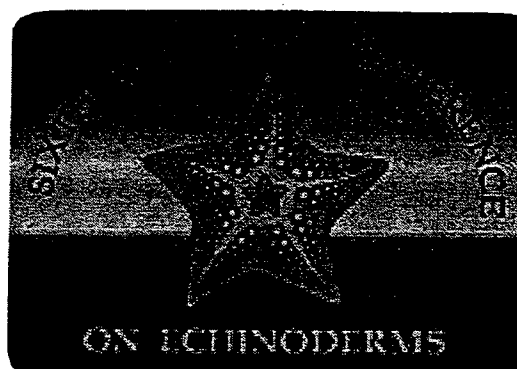
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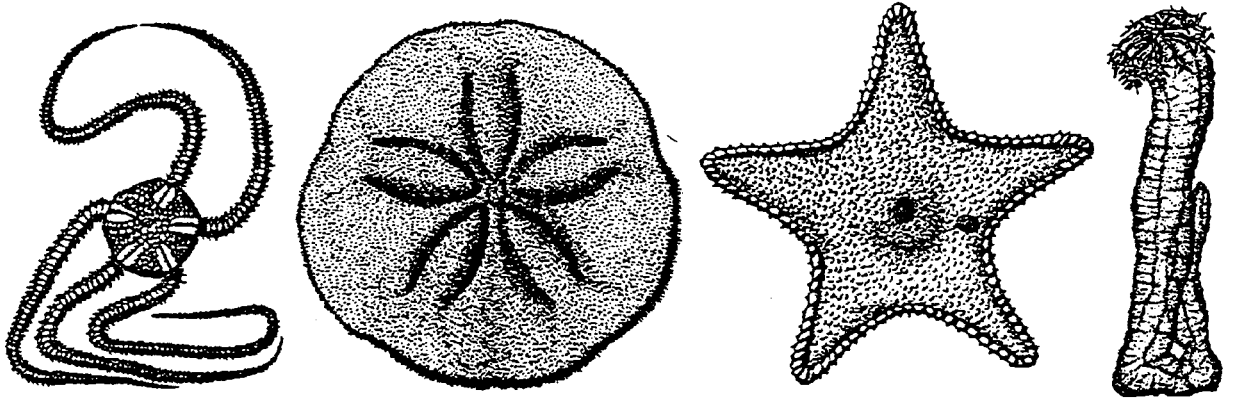
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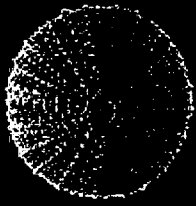
# PROGRAM AND ABSTRACTS



## FOURTH NORTH AMERICAN ECHINODERM CONFERENCE

AUGUST 22-26

DARLING MARINE CENTER  
UNIVERSITY OF MAINE  
WALPOLE, MAINE



# The Echinoid Website

[www.nhm.ac.uk/science/echinoids](http://www.nhm.ac.uk/science/echinoids)



The primary purpose of the site is to provide a taxonomic resource for the scientific community in which the genera and higher taxa of echinoid can be simply and rapidly identified. There are currently over 200 pages of detailed information about echinoid taxa. Here no holds are barred and technical terms abound. A reasonable grasp of echinoid morphology is assumed and these pages will be of most use to professional scientists and advanced researchers. For each genus information is given about the type species, the key diagnostic characters, its stratigraphical and geographical distribution, species currently assigned with confidence (not necessarily exhaustive), and remarks about recent scientific publications dealing with this taxon. Wherever possible high-quality images are provided of specimens in oral, aboral and lateral views as well as interpretive diagrams.

To access this information you can go direct to the Taxonomic index which will take you to the appropriate page, or you can use the Keys where you will find an illustrated step by step dichotomous key to help you identify which echinoid you have.

This site is a long- term project which will ultimately provide access to images of all described genera of echinoid, both recent and fossil. At present only about 20% of the genera are covered, but sections will be added as and when they are completed. The taxa that are covered comprehensively are as follows (with dates of posting or latest revision):-

Diadematoidea (17/01/01)

Pedinoidea (23/2/01)

Salenoidea (5/12/00)

Echinoidea (5/12/00)

Hololectypoida (5/12/00)

Clypeasteroidea (15/6/01)

In addition there is an Introduction giving some basic facts about how echinoids live, feed and reproduce for the casual visitor with no biological training, and a section entitled Morphology and morphological terms, providing some guidance to the formidable array of technical terms.

Designed and created by Andrew B Smith, Department of Palaeontology, The Natural History Museum (email [abs@nhm.ac.uk](mailto:abs@nhm.ac.uk)).

<http://www.nhm.ac.uk/palaeontology/echinoids/index.html>

☆☆☆☆ ECHINODERM WEB PAGES ☆☆☆☆

Fabián Acuña - <http://labic.hypermart.net>  
Departamento de Ciencias Marinas, Mar del Plata, Argentina

Nadia Ameziane - [www.mnhn.fr](http://www.mnhn.fr)  
Muséum National d'Histoire Naturelle, Paris

Larry Basch, Ecologist--Coastal Manager  
National Park Service  
Alaska Southeast Coastal Parks Cluster:  
Glacier Bay, Klondike Gold Rush, Sitka, & Wrangell-St. Elias National Parks  
[Larry\\_Basch@nps.gov](mailto:Larry_Basch@nps.gov)  
[sealives@seaknet.alaska.edu](mailto:sealives@seaknet.alaska.edu)  
<http://www.nps.gov/glba/>  
<http://www.nps.gov/klgo/>  
<http://www.nps.gov/sitk/>  
<http://www.nps.gov/wrst/home.html>

Penny Berents - Collection Manager - Marine Invertebrates - Australia  
<http://www.austmus.gov.au>

Christiane Biermann - <http://faculty.washington.edu/biermann/>  
Includes some samples of my research on fertilization and population genetics in stronglylocotroids and echinids.

David Billett - <http://www.soc.soton.ac.uk/GDD/DEEPSEAS/>  
DEEPSEAS Benthic Biology Group at Southampton Oceanography Centre

Ruediger Birenheide - [www.birenheide.com/cemb](http://www.birenheide.com/cemb)  
Canadian Echinoderm Message Board - set up to encourage conversation between Canadian and all other interested echinoderm scientists.

Francesco Bonasoro - <http://imiucca.csi.unimi.it/~echino/5ece7.htm>

Thomas Brey - <http://www.awi-bremerhaven.de>  
Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

Peter Brueggeman - Scripps Institution of Oceanography Library  
<http://scilib.ucsd.edu/sio/nsf/guide/echinodermata-1.html>  
<http://scilib.ucsd.edu/sio/nsf/guide/echinodermata-2.html>  
McMurdo Sound, Antarctica echinoderms

Casey Burns - <http://kendaco.telebyte.com/cburns/paleo>  
Various images related to my echinoderm research, usually pictures of specimens

recently collected, localities, etc.

David J. Carroll - A brief description of my research interests and list of publications  
<http://www.bio.fit.edu/Faculty/carroll.htm>

Suraphol Chunhabundit - [www.arri.chula.ac.th](http://www.arri.chula.ac.th)  
Aquatic Resources Research Institute, Chulalongkorn University, Thailand

Ron Clouse - <http://www.clouseart.com/>

Chantal Conand - [http://www.univ-reunion.fr/t10\\_fac\\_sciences/t10\\_plaquette/ecomar.htm](http://www.univ-reunion.fr/t10_fac_sciences/t10_plaquette/ecomar.htm)  
Beche de Mer Bulletin (SPC) - [www.spc.org.nc/coastfish](http://www.spc.org.nc/coastfish)

Costello, Mark J. - developing a European Register of Marine Species: details at web site  
[erms.biol.soton.ac.uk](http://erms.biol.soton.ac.uk)

Costello, Mark J. - Ecological Consultancy Services Ltd (EcoServe) at [www.ecoserve.ie](http://www.ecoserve.ie)

Dafni, J. - [www.dafni.com/gulfsave/jdafni.html](http://www.dafni.com/gulfsave/jdafni.html)

James Dalby - <http://www.gov.bc.ca/elp>  
BC Ministry of Environment, Lands & Parks

Claire Dalglish - Our company is currently working with macrobenthos sampled from the North East Atlantic margin, mainly in the Faroe-Shetland channel as part of environmental monitoring programmes within the oil and gas industry, UK. Environment and Resource Technology's Homepage offering an introduction to a wide range of inhouse environmental capabilities at [www.ert.co.uk](http://www.ert.co.uk)

Bruno David - <http://www.u-bourgogne.fr/BIOGEOSCIENCE/>

Dimitri D. Deheyn - <http://siobiolum.ucsd.edu>  
Site describing the research topics in the lab (M. LATZ's lab), Scripps Institution of Oceanography.

Yannick Dewael - <http://lifesci.ucsb.edu/~biolum/forum/ydewael1.html>  
My page on the bioluminescence web site.

Patricio Dominguez-Alonso - <http://www.ucm.es/info/paleo/personal/patricio.htm>  
Personal page with interests and publication list

Samuel Dupont -  
1/ Summary of my PhD project  
<http://lifesci.ucsb.edu/~biolum/forum/sdupont1.html>

2/ Personal page and Curriculum vitae (Update 20 March 2000)  
<http://www.biol.ucl.ac.be/fyga/Dupont.html>

3/ Web page of the Animal Physiology lab  
<http://www.biol.ucl.ac.be/fyga/>

Also, from Sam Dupont

Results of project on the small bioluminescent ophiuroid *Amphipholis squamata* presented at the **11th International Symposium on Bioluminescence and Chemiluminescence**.

Oral communication presented as a web page.

I invite you to visit <http://www.biol.ucl.ac.be/fyga/californie/page1.html>

Ebert, T. A. 1998. Plant and Animal Populations. Methods in Demography. Academic Press, San Diego, CA 312p The book includes various echinoderm examples for illustrating analysis of growth, survival, allometry and matrix methods; see [http://www.sci.sdsu.edu/Cornered\\_Rat/](http://www.sci.sdsu.edu/Cornered_Rat/)

Jon Eggert - (contact: [midvangur@islandia.is](mailto:midvangur@islandia.is)). Reference Page [http://www.islandia.is/~midvangur/new\\_page\\_8.htm](http://www.islandia.is/~midvangur/new_page_8.htm)

Jean-Pierre Féral - <http://www.obs-banyuls.fr/web/departs/feral/biolpop/Accueil1.htm>  
UMR 7628 - MODELES EN BIOLOGIE CELLULAIRE ET EVOLUTIVE  
Biologie de Populations et Évolution des Invertébrés Marins.

The 6th European Conference on Echinoderms, Banyuls-sur-mer, France on September 3-7, 2001

<http://www.obs-banyuls.fr/web/departs/feral/biolpop/Accueil1.htm>

Maria Dolores Gil Cid - <http://www.ucm.es/info/paleo/personal/gilcid.htm>  
Professor, Department of Paleontology, Ciudad University, Madrid, Spain  
ViceDirector del Instituto de Geología Económica (CSIC-UCM).

Kriton Glenn - <http://www.agso.gov.au>  
AUSTRALIAN GEOLOGICAL SURVEY ORGANISATION

Ben Greenstein - <http://www.cornell-iowa.edu/~bgreenstein>

Philippe Grosjean - Marine Biology Laboratory, ULB, Belgium, Mariculture and Biostatistic, SciViews Project Coordinator - <http://www.sciviews.org>

Monique Guillou -

My main echinoderm model in ecology and ecotoxicology is *Sphaerechinus granularis*.

Please find in this web page some informations to better know this sea urchin.

<http://www.univ-brest.fr/IUEM/BIOFLUX/PNDR/echino.html>

In *Sphaerechinus granularis* resource allocation is "plastic" and varies in response to environmental changes. The following page presents changes in the reproductive strategy of this species according to food availability.

<http://www.univ-brest.fr/IUEM/BIOFLUX/PNDR/allocener.html>

Rosemary Hall - Curriculum vitae  
<http://RosemaryHall.homestead.com/REHCurriculumVitae.html>

Jean-François Hamel - [www.seve.cjb.net](http://www.seve.cjb.net)

Reimund Haude - <http://www.gwdg.de/~uggpwww/>

Joan Herrera - <http://nersp.nerdc.ufl.edu/~herrera/>

Liam Herringshaw - This is a fairly simple personal profile of me within the School of Earth Sciences' website. It includes a particularly scary photograph.

[http://www.bham.ac.uk/EarthSciences/people/research/herringshaw\\_1.html](http://www.bham.ac.uk/EarthSciences/people/research/herringshaw_1.html)

Alan Hodgson - <http://www.rhodes.ac.za/conferences/icird2001>

**9th International Congress on Invertebrate Reproduction and Development. July 2001.** First announcement and preliminary details

Anne Hoggett and Lyle Vail - <http://www.austmus.gov.au/science/projects/lizard/index.htm>  
Directors, Lizard Island Research Station

Susan Hottenrott - <http://home.att.net/~ophiuroid>

"The Ophiuroidea- bringing you the very latest in ophiuroid technology, news and gossip" This is an entertaining and informative site for both for the general public seeking ophiuroid basics as well as colleagues and graduate students seeking information on museum collections, funding and systematics resources.

Fatih Huseyinoglu - [www.geocities.com/fateaux](http://www.geocities.com/fateaux)

personal web page, includes personal pictures, *Asterias rubens* and some downloadable documents.

John W.M. Jagt - [www.nhmmaastricht.nl](http://www.nhmmaastricht.nl)

Natuurhistorisch Museum Maastricht

R. Jeyabhaskaran - <http://www.nio.org>

Biological Oceanography Division, National Institute of Oceanography, Dona Paula India.

Craig Johnson - Tasmanian Aquaculture and Fisheries Institute [TAFI]

TAFI web site: [http://www.utas.edu.au/docs/tafi/TAFI\\_Homepage.html](http://www.utas.edu.au/docs/tafi/TAFI_Homepage.html)

University of Tasmania, Dept of Zoology-

Zoology web site: <http://www.utas.edu.au/docs/zoology/homepage.html>

Thomas Kammer - <http://www.geo.wvu.edu/~kammer/welcome.htm>

Brian Keller - [www.fknms.nos.noaa.gov](http://www.fknms.nos.noaa.gov)

Alexander Kerr - Tree of Life Holothuroidea Web Page

<http://phylogeny.arizona.edu/tree/eukaryotes/animals/echinodermata/holothuroidea/holothuroidea.html>

Philip Lambert - <http://rbcm1.rbcm.gov.bc.ca> Royal British Columbia Museum web site.  
Includes information on all aspects of the museum.

<http://www.royalbcmuseum.bc.ca/research-collectionsdept/nat-hist/section/lambert.html>

John Lucas - URL Aquaculture: <http://www.jcu.edu.au/dept/Aquaculture/aquacult.htm>

Chris Mah - <http://www.geology.uiuc.edu/~fossils/> This page currently describes the research program in our lab. (Currently out of date but should be more up to date very soon!)

Richard Martin - <http://www.marine.csiro.au/CRIMP/>  
Home page for the CSIRO Centre for Research on Introduced Marine Pests

J. Douglas McKenzie - [www.integrin.co.uk](http://www.integrin.co.uk)  
(Integrin Advanced Biosystems Ltd, Marine Resource Centre, Oban, Scotland) deals mostly with marine invertebrates.

Tamara McGovern - details research and study system  
<http://bio.fsu.edu/~mcgovern/>

Charles Messing's comatulid crinoid page: morphology, taxonomy, ecology & feeding)  
<http://www.nova.edu/ocean/messing/crinoids/w1title.html>

Philip Mladenov - <http://gandalf.otago.ac.nz:800/Marine/marine.htm>

Rich Mooi - CAS Echinoderm Web Page  
[www.calacademy.org/research/izg/echinoderm/](http://www.calacademy.org/research/izg/echinoderm/)

Andrew Morgan - <http://www.auckland.ac.nz/leigh>  
Leigh Marine Laboratory web page:  
<http://www.auckland.ac.nz/Students/amorgan>

Tatsuo Motokawa - <http://www.bio.titech.ac.jp/~tmotokaw/>  
Basic Biology, Tokyo Institute of Technology

James Nebelsick - <http://homepages.uni-tuebingen.de/nebelsick/>  
Great animation of a "Clypeaster going down the taphonomic road to destruction"

Richard Pagett - <http://www.interventionworks.com>  
Environmental Management & Training, Wiltshire, UK

John Pearse - <http://www.biology.ucsc.edu/faculty/pearse.html>

Vaclav Petr - A complete and updated bibliography of Rudolph J. Prokop  
<http://www.natur.cuni.cz/~vpetr/Rudolph.htm>  
English home page - <http://www.natur.cuni.cz/~vpetr/Anglicky.htm>  
Petr bibliography - <http://www.natur.cuni.cz/~vpetr/Petr.htm>  
Anniversary article for F.H.C. Hotchkiss - <http://www.natur.cuni.cz/~vpetr/Birth.htm>

Dieter Piepenburg - <http://www.uni-kiel.de/ipoe>

Mike Reich - <http://www.uni-greifswald.de>  
"The Fossil Holothuroidea Webpage"  
<http://www.uni-greifswald.de/~geo/REICH/P224.htm>



Mike Reich, (University of Greifswald, Germany)

has prepared a bibliography of fossil holothurians (after 1990) -- please check:

<http://www.uni-greifswald.de/~geo/REICH/P310.htm>

[the complete bibliography of fossil holothurians (1828-1999) will be published next year].

Paige Rothenberger - <http://rps.uvi.edu/vimas>

VI Marine Advisory Service, Center for Marine & Environmental Studies, University of the Virgin Islands

Michael S. Roy - <http://www.otago.ac.nz/Zoology/staff/mr.html>

Michael P. Russell - [www.homepage.villanova.edu/michael.russell](http://www.homepage.villanova.edu/michael.russell)

Personal web site

Bernhard Ruthensteiner (Conservator and Leader of the Invertebrate Section)

[http://www.zsm.mwn.de/wiss\\_start.htm](http://www.zsm.mwn.de/wiss_start.htm)

Zoological State Collection Munich, Echinoderm Collection.

I would like to announce that information on the type material of our echinoderm collection is available at this Web-address.

**Go to Evertab. varia Sammlung.** There is a list of echinoderm type specimens. The echinoderm collection consists mainly of material collected by Ludwig Döderlein in Japan. (Email: [BRuthensteiner@zsm.mwn.de](mailto:BRuthensteiner@zsm.mwn.de))

Robert Singletary - <http://www.bridgeport.edu/~robert>

Mattias Skold - <http://www.otago.ac.nz/MarineScience>

Norman Sloan - [www.harbour.com/parkscan/gwaii](http://www.harbour.com/parkscan/gwaii)

Marine Ecologist, Gwaii Haanas National Park Reserve sea cucumber fisheries.

Andrew Smith - [www.nhm.ac.uk/palaeontology/echinoids/index.html](http://www.nhm.ac.uk/palaeontology/echinoids/index.html)

Taxonomic website on the genera of Echinoidea. The site currently stands at some 3400 items and about 400 high quality images of the genera, comprehensive for the Diadematoida, Echinoida, Holecypoida, Salenioida and Clypeasteroida. In addition there are systematic keys and introductory sections on the morphology and biology of echinoids.

L. Courtney Smith - [www.gwu.edu/~clade/faculty/smith.html](http://www.gwu.edu/~clade/faculty/smith.html)

Renate Sponer - molecular evolution of ophiuroids: phylogeny, phylogeography, population genetics in *Amphipholis squamata*, *Ophiactis savignyi*, *Ophiocoma scolopendrina*.

<http://www.dnapop.zi.ku.dk>

Kathryn Stevenson - <http://www.gla.ac.uk/Acad/Marine/library.htm>

University Marine Biological Station, Millport, Isle of Cumbrae, Scotland

Sabine Stoehr - <http://www.nrm.se/ev/staff/stohr.html.en>

Jarek Stolarski - [www.paleo.pan.pl](http://www.paleo.pan.pl)

Institute of Paleobiology, Polish Academy of Sciences

Claudio Tiago and Valeria Hadel - <http://www.usp.br/cbm/>  
Homepage Centro de Biologia Marinha at Unversidade de São Paulo, Brasil

Research page - <http://www.usp.br/cbm/pesquisa.html>

BIOTA/FAPESP - The Virtual Institute of Biodiversity - <http://www.biotasp.org.br>  
This is a biodiversity conservation and sustainable use research program for the State of São Paulo, Brazil, sponsored by FAPESP.

Tommasi, L.R. 1999. Echinodermata recentes e fósseis do Brasil. In: BDT - Informação científica -Diversidade de espécies - Fauna - Invertebrados. Campinas: Banco de Dados 123Tropical. [in Portuguese]. <http://www.bdt.org.br/zoologia/echinodermata/>

Curriculum involving echinoderms, especially the Brazilian REVIZEE material (NE and SE Brazilian regions); also, antarctic collections; palaeobiogeography and modern biogeography of echinoderms in the South Atlantic region.  
[www.geocities.com/CollegePark/center/2122](http://www.geocities.com/CollegePark/center/2122)

Mat Vanderklift - <http://www.botany.uwa.edu.au/marine/homepages/matvanderklift.html>

Jacob van der Land - <http://www2.eti.uva.nl/database/urmo/default.html>  
editor of Unesco-IOC Register of Marine Organisms (URMO)

Steve Veatch - [http://geoscience.htmlplanet.com/Sea\\_urchin.htm](http://geoscience.htmlplanet.com/Sea_urchin.htm)  
short paper on fossil sea urchins near Garden of the Gods, Colorado.

Anders Waren - <http://www.nrm.se/ev/staff/waren.html.se>

Gert Woerheide - <http://www.calcarea.nu>  
Calcareous sponges from the Great Barrier Reef

Greg Wray - The Tree of Life home page: <http://ag.arizona.edu/ENTO/tree/phylogeny.html>

Echinodermata: <http://phylogeny.arizona.edu/tree/eukaryotes/animals/echinodermata/echinodermata.html>

Crinoidea: <http://phylogeny.arizona.edu/tree/eukaryotes/animals/echinodermata/crinoidea/crinoidea.html>

Jiri Zitt - <http://www.grisoft.cz>  
Zkontrolovano antivirovym systemem AVG

☆☆☆☆☆ INFORMATION REQUESTS ☆☆☆☆☆

BUNDRICK, CARLA - is collecting submissions of Echinoderm Poetry (original works, please!) For an upcoming publication honoring Walter Garstang. Snail-mail and email accepted. Please contact me at [bookw342@aol.com](mailto:bookw342@aol.com) or 24 Talbot Street, Salinas CA 93901

DELBONI, CYNTHIA GRAZIELLE MARTINS - requests papers published on ossicle formation in holothurians, methods of preparation etc. Please contact [cydelbon@zaz.com.br](mailto:cydelbon@zaz.com.br)

HENKEL, TIMOTHY - I am interested in habitat use of the sponge-dwelling ophiuroid *Ophiothrix lineata* and am looking for any sitings or samples in collection and where they were found. Please contact [henkelt@uncwil.edu](mailto:henkelt@uncwil.edu)

HORSTMAN, DEON - I'm starting to assess the mariculture potential of an indigenous sea urchin *Tripneustes gratilla* through laboratory rearing of early life history stages. I would urgently like to make contact with scientists doing similar research. Please contact [horstman@sfri.wcape.gov.za](mailto:horstman@sfri.wcape.gov.za)

IVY, GRISILDA - requests reprints related to sea cucumber culture and reproductive biology. Please contact [ivygrisilda@hotmail.com](mailto:ivygrisilda@hotmail.com)

JACKSON, JENNIFER - I am really keen to aquire DNA samples of irregular echinoidea, particularly any spatangoidea and clypeasteroidea. I only need about a cm square of tissue or 0.5g of test in order to perform a successful extraction so any material would be useful and very gratefully appreciated. Please contact [jennifer.jackson@linacre.ox.ac.uk](mailto:jennifer.jackson@linacre.ox.ac.uk)

JAGT, JOHN W.M. - I would greatly appreciate receiving any Recent ophiuroids (preferably identified to species level, and representing all orders), or fragments of such (in particular arms), for an ongoing study of fossil brittle stars (Late Cretaceous of NW Europe). Please contact me at [mail@nhmmaastricht.nl](mailto:mail@nhmmaastricht.nl)

JEYABASKARAN, R. - requests information about taxonomy of corals and their associated animals. Please contact [jaybas@darya.nio.org](mailto:jaybas@darya.nio.org)

MAGSINO, RICHARD - I would like to request literature reprints from researchers working on the population genetics of reef invertebrates. I will be very thankful if I can get contacts with specialists in the field. Please contact [rickym@upmsi.ph](mailto:rickym@upmsi.ph)

MENDES, CARLA LIMA TORRES - requests information related to the following topics.  
Feeding ecology of *Echinometra lucunter*: feeding preference in relation to food availability in Cabo Frio region, Rio de Janeiro, Brazil.

Please contact at [carlamendes@rjnet.com.br](mailto:carlamendes@rjnet.com.br)

NITHYANANDAN, MANICKAM - I request reprints regarding the deep sea echinoderms of the east coast of India (Bay of Bengal).

Please contact [nithyanandanm@yahoo.com](mailto:nithyanandanm@yahoo.com)

ORTIZ, EDUARDO MORTEO - I'm currently studying about the artisanal fishery of starfish in Baja California, Mexico. I would appreciate any information relating to this topic.

Please contact [eddymorteo@hotmail.com](mailto:eddymorteo@hotmail.com)

OYEN, CRAIG - I am gathering data (species diversity, geographic and biostratigraphic distribution) regarding fossil comatulid crinoids from the southeastern U.S. Any comments regarding occurrences from Texas to Maryland is welcome.

Please contact [cwoyen@ship.edu](mailto:cwoyen@ship.edu)

RANNER, HERWIG - I would be interested in having information about the geographic distribution of *Asterias rubens* worldwide.

Please contact [herwig.ranner@gmx.net](mailto:herwig.ranner@gmx.net)

TAHERA, QASEEM - would appreciate any publication on echinoderms relating to taxonomy, systematics, reproduction and larval distribution.

Please contact [qaseem@mrc.ku.edu.pk](mailto:qaseem@mrc.ku.edu.pk)

TAVARES, YARA APARECIDA GARCIA - I'm beginning study sea urchin fishery monitoring and I would like to contact some specialist in echinoids fisheries and receive publications about sea urchin aquaculture and management.

Please contact me at [ytavares@aica.cem.ufpr.br](mailto:ytavares@aica.cem.ufpr.br)

## ☆☆☆ CONFERENCE ANNOUNCEMENT ☆☆☆

Communicated by Thomas Heinzeller

### 11th International Echinoderm Conference Munich 2003

Please be informed that the website [www.iec2003.uni-muenchen.de](http://www.iec2003.uni-muenchen.de) is on-line

The 11th International Echinoderm Conference will be held at the Ludwig-Maximilians-Universität, Munich, Germany, from October 6 - 10, 2003. The Local Organising Committee comprises members of the Medical Faculty (U.Welsch, T. Heinzeller), and of the Faculty of Geological Sciences (R.Leinfelder).

Registration and abstracts as well as special requests, comments and proposals should all be sent to T. Heinzeller, if ever possible by e-mail ([Heinzeller@anat.med.uni-muenchen.de](mailto:Heinzeller@anat.med.uni-muenchen.de)).

Those to whom it is not possible, may post to:

11th IEC 2003  
Prof. Dr. Thomas Heinzeller  
Anatomische Anstalt der LMU  
Pettenkoferstrasse 11  
D-80336 Muenchen  
Germany

#### Key Dates and Registration

##### Dates and Deadlines:

As soon as possible: booking of the hotel (for details see Accommodation)

April 1, 2003: Submission of abstracts. Only abstracts submitted in time can be included in the abstract booklet.

April 1, 2003: Latest date to pay the reduced registration fee

June 1, 2003: Submission of manuscripts for the proceedings volume

July 1, 2003: Deadline for room booking by the Munich Tourist Office

##### Cancellations and Refunds:

between July 1, 2003, and September 1, 2003, requests will be refunded minus only a moderate handling fee

between September 2, 2003, and October 5, 2003: 50% refund

October 5, 2003, evening: Arrival and Welcome-Party

October 8, 2003, afternoon: Excursion, evening: Banquet

October 10, 2003, afternoon: to say goodbye

The days thereafter: Post-conference excursions (see Social events and Excursions)

## **Registration**

**Downloading a registration form will be possible from April 2002**

Further links:

IEC-Homepage

Venue, Travel and Accomodation

Scientific Programme

Presentations and Proceedings

Social Events and Excursions



**Communicated by Mike Reich**

### **The "1. Arbeitstreffen deutschsprachiger Echinodermenforscher" "1st meeting of german speaking Echinoderm Researcher"**

was held at Greifswald (Northeastern Germany, 200 km north of Berlin on the Baltic Sea coast) from May 11 to 13, 2001

<http://www.echinodermata.de/echino.htm>

email: [reichmi@mail.uni-greifswald.de](mailto:reichmi@mail.uni-greifswald.de)



## **ANNOUNCEMENT**

### **Press release - Sea Cucumber Research**

**Communicated by Julia Elliott (University of Hull)**

The University of Hull on a mission to save the sea cucumber.

The University is taking the lead in a major international project to save the sea cucumber - an extremely odd looking creature - but one of the ocean's most important marine species with environmental, gastronomic and potential medicinal qualities.

Dr Andrew Lawrence of the Department of Biological Sciences has been awarded E1 60,700 by the Government's Darwin Initiative to develop a sustainable fishery on the Red Sea coast of Egypt.

Hull has beaten off stiff competition from other universities and conservation organisations to win the grant for the project which begins in September 2001. It is one of 31 projects under the prestigious Initiative which was established at the Rio Summit in 1992 and aims to safeguard the world's biodiversity.

Sea cucumbers are closely related to starfish and sea urchins and live predominantly in the Tropics. They are believed to have medicinal qualities in the treatment of whooping cough, bronchial inflammation and arthritis and also perhaps in the treatment of tumors. In the Far East in particular, they are also exploited as a dried, salted or smoked food called Trepanng or Beche-de-mer.

'Sea cucumbers are in high demand and their fisheries have a history of over-exploitation and collapse, leaving behind a disrupted and impoverished environment,' said Dr Lawrence.

'This is made even worse by the fact that sea cucumbers are a key species, playing a vital role in the structure and function of coral reef communities. The degradation of the reefs adversely affect other fisheries and the tourist industry. In no case so far has a sea cucumber fishery been maintained and sustainable, which is why this project is so important.'

There are four main elements to the project:

- \* To measure the current stocks of sea cucumbers to develop a sustainable fishery plan
- \* To develop a pilot 'mariculture system' which will be used to restock depleted areas of the coast and small sitale, community based, farming systems.
- \* To identify and extract certain materials from the sea cucumbers which have potential medical benefits - for example antibacterial and antifungal properties.
- \* To train local people in stock assessment methods and fishermen in mariculture techniques.

Three Egyptian research students will be coming to the University to work on the project with Dr Lawrence. It will be one of the first collaborations between the University and Hull's new World Ocean Discovery Centre, The Deep, which has offered to support the project in any way possible and help with the dissemination of the results. The University will also be working with the Suez Canal University, the Egyptian Environmental Affairs Agency and the Red Sea Governate.

'All four elements of the project will enable the Egyptian Government to put into place a management plan for the sustainable exploitation of sea cucumbers,' said Dr Lawrence.

More about the exploitation of sea cucumbers

- \* Sea cucumber fisheries have collapsed throughout the Indo Pacific with many expensive species being commercially extinct in countries including the Solomon Islands, Cook Islands and Fiji.
- \* In one extreme case, demand has led to the development of an illegal fishery in the Galapagos Marine Reserve. Attempts to close it have resulted in direct confrontation between fishermen and conservationists.
- \* Clandestine fisheries have been set up on pristine islands and there have been disturbing cases of

ecoterrorism.

\* The fishery on the Red Sea Coast of Egypt would have most probably followed the pattern of other fisheries had this project not been developed.

More details: Julia Elliott, Public Relations Office 10482 466326

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## NEW BOOK ANNOUNCEMENTS

(Contributed by John M. Lawrence)

**Jangoux, M., and J.M. Lawrence. (editors) 2001. Echinoderm Studies. Volume 6. A.A. Balkema, Lisse. (Swets & Zeitlinger Publishers, P.O. Box 1675, 3000 BR Rotterdam, The Netherlands. FAX +31 10 4135947)**

Balch, T., and R.E. Scheibling. Larval supply, settlement and recruitment in echinoderms. 1-83.

Mita, M., and M. Nakamura. Energy metabolism of sea urchin spermatozoa: the endogenous substrate and ultrastructural correlates. 85-110.

De Ridder, C., and T.W. Foret. Non-parasitic symbioses between echinoderms and bacteria. 111-169.

Ausich, W.I. Echinoderm taphonomy. 171-227.

Clark, A.M., and C. Mah. An index of names of recent Asteroidea -- Part 4: Forcipulatida and Brisingida. 229-347.





**Lawrence, J.M. (ed.) 2001. Edible sea urchins: biology and ecology. Elsevier, Amsterdam, The Netherlands. (Elsevier Science, PO BOX 945, New York, NY 10159-0945, FAX 1-212-633-3680; Elsevier Science, PO Box 211, 1000 AE Amsterdam, The Netherlands, FAX 31-20-4853432)**

- Lawrence, J.M. The edible sea urchins. 1-4  
Walker, C.W., T. Unuma, N.A. McGinn, L.M. Harrington, and M.P. Lesser. Reproduction of sea urchins. 5-26  
Marsh, A.G., and S.A. Watts. Energy metabolism and gonad development. 27-42  
Wasson, K.M., and S.A. Watts. Reproductive endocrinology of sea urchins. 43-57  
McEdward, L.R., and B.G. Miner. Echinoid larval ecology. 59-78  
Ebert, T.A. Growth and survival of post-settlement sea urchins. 79-102  
Lawrence, J.M., and T.S. Klinger. Digestion in sea urchins. 103-113  
Matsuno, T., and M. Tsushima. Carotenoids in sea urchins. 115-138  
Tajima, K., and J.M. Lawrence. Disease in edible sea urchins. 139-148  
Andrew, N., and M. Byrne. The ecology of *Centrostephanus rodgersii*. 149-160  
Vasquez, J. Ecology of *Loxechinus albus*. 161-175  
Boudouresque, C.-F., and M. Verlacque. Ecology of *Paracentrotus lividus*. 177-216  
Kelly, M., and E. Cook. The ecology of *Psammechinus miliaris*. 217-224  
McClanahan, T.R., and N.A. Muthiga. The ecology of *Echinometra*. 225-243  
Barker, M.F. The ecology of *Evechinus chloroticus*. 245-260  
Keesing, J. The ecology of *Heliocidaris erythrogramma*. 261-270  
Scheibling, R.E., and B.G. Hatcher. The ecology of *Strongylocentrotus droebachiensis*. 271-306  
Tegner, M.J. The ecology of *Strongylocentrotus franciscanus* and *Strongylocentrotus droebachiensis*. 307-331  
Agatsuma, Y. Ecology of *Strongylocentrotus intermedius*. 333-346  
Agatsuma, Y. Ecology of *Strongylocentrotus nudus*. 347-361  
Agatsuma, Y. Ecology of *Hemicentrotus pulcherrimus*, *Pseudocentrotus depressus*, and *Anthocidaris crassispina* in southern Japan. 363-374  
Watts, S.A., J.B. McClintock, and J.M. Lawrence. The ecology of *Lytechinus variegatus*. 375-393  
Lawrence, J.M., and Y. Agatsuma. The ecology of *Tripneustes*. 395-413  
Lawrence, J.M. Sea-urchin roe cuisine. 415-416



**MONOGRAPHIE SUR LES OURSINS DU CORALLIEN DES ARDENNES  
VADET, ALAIN**





## **Echinoderms of the Philippines**

**by Sabine Schoppe, 2000**

Price: US\$12.50

Suitable For: General interest

ISBN: 9812320938

Specifications:

210 x 148 mm, 144 pages, Soft cover, Line drawings and full colour photographs

About the Book: Starfishes, sea cucumbers and sea urchins are the familiar creatures hidden behind the far less common term of echinoderms. Many species of the echinoderms can be found in the shallow waters of the Philippines seas -one of the most productive marine ecosystems in the world. Some echinoderms, such as the Crown-of Thorns sea star, are keystone predators capable of effecting enormous ecological changes; various sea cucumbers and sea urchins are the basis of important fisheries; other echinoderms are used in biomedical research, serving as sources of pharmaceuticals, and are monitored as indicators of environmental health. Over 80 different species, accompanied by brief descriptions of each one with information on habitat, associated organisms, and distribution, serve to depict and describe many conspicuous species of echinoderms. Fully illustrated with colour photographs, the book is an easy-to-follow guide for amateurs and enthusiasts alike.

To order or for more specifications check: <http://www.timesone.com.sg/te>

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**ECHINODERM-L NOTICE**

### **Looking for good Ph.D. students**

Contributed by Florence Thomas

Research Fellowships available for competitive students interested in pursuing a Ph.D. on the role of physical processes in the reproductive biology of marine invertebrates. The University of South Florida offers excellent support for highly competitive graduate students. If you are interested please contact me Dr. Florence Thomas [ftomas@chuma1.cas.usf.edu](mailto:ftomas@chuma1.cas.usf.edu). I am also interested in attracting students interested in the role of physical processes in the nutrient dynamics of subtropical and tropical communities.

## REPRINTS AVAILABLE

Dr. Daniel James reprints on Echinoderms. Those who are interested may please contact Dr.D.B. James at

No 13, Bharathiar Street, Metha Nagar, Chennai, Tamil Nadu 600029 INDIA

Phone: 91-044-3745351

Email: [baskar\\_james@yahoo.com](mailto:baskar_james@yahoo.com)

A complete bibliography of Dr. James' reprints follows the Announcement Section ( see page 142)



## ANNOUNCEMENT - ON-LINE PUBLICATION

Communicated by Thomas Brey

Dear friends and colleagues,

Herewith I wish to announce the online publication of

### **"POPULATION DYNAMICS IN BENTHIC INVERTEBRATES - A VIRTUAL HANDBOOK"**

which you will find at

<http://www.awi-bremerhaven.de/Benthic/Ecosystem/FoodWeb/Handbook/intro/index.html>

This handbook

- exists as a free-of-charge online version only - tries to summary the actual stage of methods and techniques in population dynamics studies

- is neither complete nor will it ever be, because science is a continuous process

The author

- hopes you will find this handbook useful and you will forward its website to many colleagues

- waits for feedback from readers/users

Dr. Thomas Brey

Ecosystem Research

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Fax: ++49 (0) 471 4831 1149

www: <http://www.awi-bremerhaven.de>



# Sea Stars

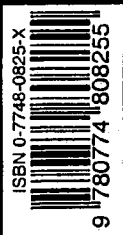
OF BRITISH COLUMBIA,  
SOUTHEAST ALASKA AND PUGET SOUND

Walk along any coastal shore and you are likely to see some colourful sea stars clinging to the rocks below the surface of the water. These fascinating animals can live in almost any marine habitat, from rocky tidal pools to deep-ocean muck. Sea stars belong to a group of marine invertebrates called echinoderms, and they are related to sea cucumbers and sea urchins.

In this new handbook, Philip Lambert describes 43 species of sea stars that live in the productive coastal waters (to a depth of 200 metres) from Glacier Bay in southeast Alaska to Puget Sound in northern Washington, including the entire coast of British Columbia. The sea-star fauna of this region is the most diverse of all the temperate waters of the world, due to the great age of the Pacific Basin and the variety of habitats along this complex coastline.

Photographs and illustrations help identify all 43 species, and a colour section highlights the shallow-water animals in their natural habitats. The author also lists 26 species that live below 200 metres and 14 others that occur just north or south of the region.

Philip Lambert is curator of marine invertebrates at the Royal British Columbia Museum and author of *Sea Cucumbers of British Columbia, Southeast Alaska and Puget Sound*.



UBC Press

ISBN 0-7748-0825-X

ROYAL BRITISH COLUMBIA MUSEUM HANDBOOK

# Sea Stars

OF BRITISH COLUMBIA, SOUTHEAST ALASKA  
AND PUGET SOUND

PHILIP LAMBERT

Drawings by Gretchen Markle  
Photographs by Brent Cooke and Philip Lambert



UBC Press · Vancouver · Toronto

## ☆☆☆☆☆ BOOK REVIEW ☆☆☆☆☆

Contributed by Bryan Nichols  
[nicholsbry@pacificcoast.net](mailto:nicholsbry@pacificcoast.net)

Sea Stars of British Columbia, Southeast Alaska and Puget Sound  
Philip Lambert  
UBC Press 2000; 186p  
ISBN 0-7748-0825-X

Combine the world's most interesting and accessible assemblage of sea stars (the Pacific Northwest) with a brand new updated guide to the shallower species (43 of them) and you've got a vacation made in echinoderm heaven. Philip Lambert, curator of marine invertebrates for the Royal British Columbia Museum in Canada, has updated his small black and white text of the 80's - it's now something of a cross between a field guide and a scientific handbook.

The New "Sea Stars of BC." is bigger, longer and colorized. It includes a much needed section of color photography, mostly in situ, to complement the more clinical black and white shots of dried specimens. Rounding out the highlights for visual learners are excellent illustrations of details like plates and spines.

The importance of the color photographs for field id cannot be emphasized enough and I'd have included even more. While doing surveys here I have counted hundreds of individual sea stars and up to sixteen species in less than an hour underwater. Many sites, including shore dives, routinely offer a dozen or more species on a single dive.

The book provides a key to each family with representatives above 200 meters; it takes you to a general family description and individual species accounts. These include description, similar species, distribution, biology and references. The similar species section is new and usually very helpful. The book also lists families and species that occur below 200m as well as those just north or south of the geographic zone covered. Rounding out the species accounts is some basic sea star biology plus a taxonomical checklist, glossary and decent index.

### IF I WERE PUBLISHER

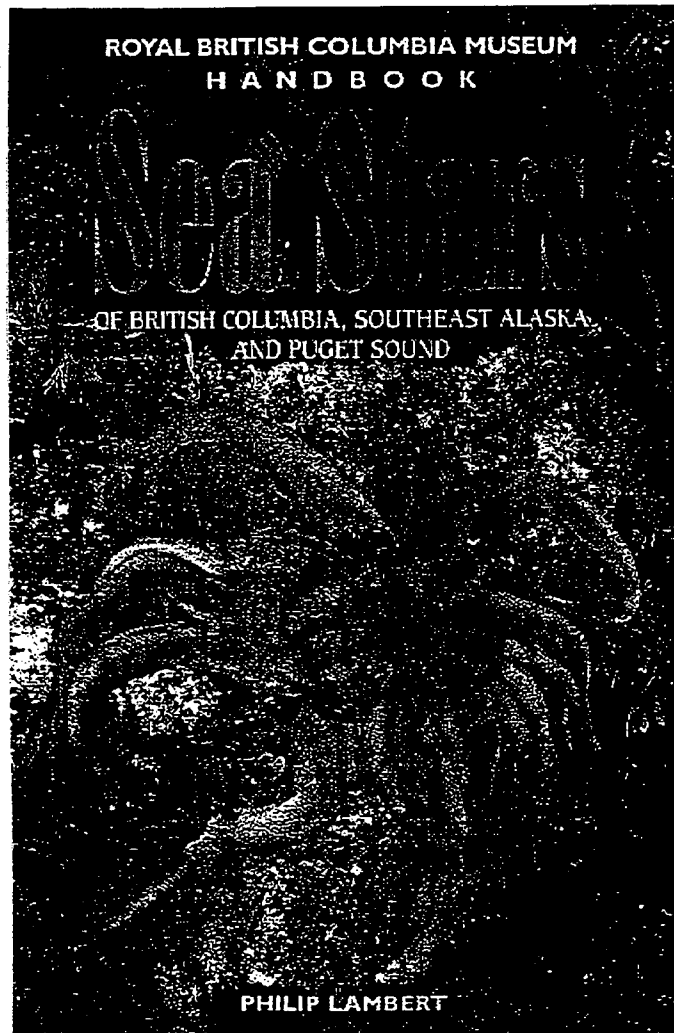
Things wouldn't be that different. About ten percent of this book is dedicated to references which are listed in the species accounts and then expanded in the back. How necessary is such extensive referencing? How much

will they actually be used? This is a question that will continue to plague publishers of books that appeal to both scientists and the general public. I would prefer the book emphasized field identification - the scientific references could be included as an inexpensive handout taken from a continually updated web based bibliography that could be searched, downloaded and printed.

I would also formalize the descriptions of living species a bit more, including a specific heading for color (noting aboral/oral differences as well as tube feet). This information is usually given but can be hard to spot quickly. Finally, I would also include a "sightings" heading with information on the best places and techniques to spot each sea star accessible to divers and beachwalkers.

#### TAKE IT HOME?

If sea stars fascinate you (and they're pretty hard to resist on this coast) then you'll appreciate this book. It is essential to anyone doing research involving Northwest sea stars and is also a great field guide for divers and seashore naturalists.



# The Marine Fauna of New Zealand: Echinodermata: Asteroidea (Sea-stars)

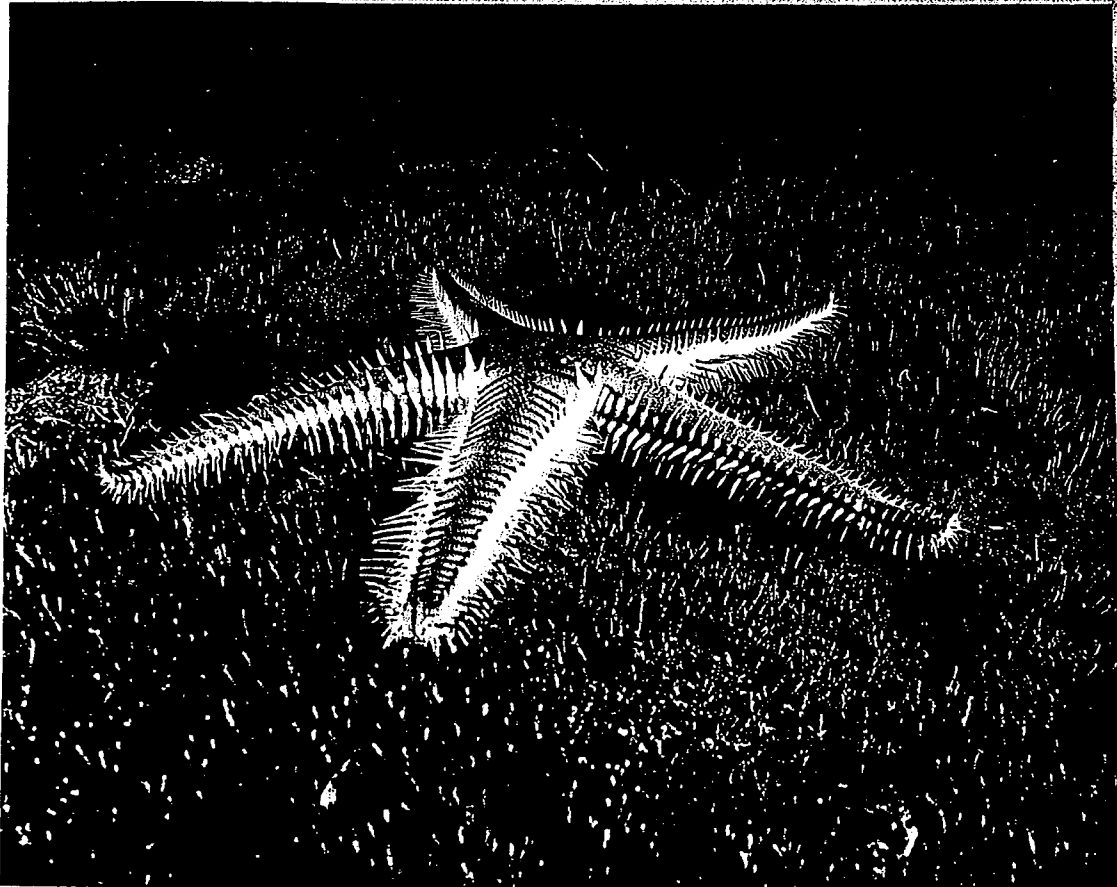
## Order Paxillosida

H.E.S. CLARK and D.G. McKNIGHT

## Order Notomyotida

D.G. McKNIGHT

National Institute of Water and Atmospheric Research Ltd  
(NIWA)  
P.O. Box 14-901, Kilbirnie, Wellington  
New Zealand



The Marine Fauna of New Zealand  
**Echinodermata: Asteroidea (Sea-stars)**  
Order Paxillosida H.E.S. Clark, D.G. McKnight  
Order Notomyotida D.G. McKnight

NIWA Biodiversity Memoir 116

2000

# INTERNATIONAL CONFERENCE ON FISHERIES, AQUACULTURE AND MARKETING OF SEA URCHINS

Puerto Varas, Chile  
March 2003

## Organizers

Eduardo Bustos, Instituto de Fomento Pesquero, Chile  
Sergio Olave, Instituto de Fomento Pesquero, Chile  
John Lawrence, University of South Florida, USA

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Muki Shpigel, National Center for Mariculture, Israel



View from Puerto Varas





**For Immediate Release**

August 10, 2001

**For More Information**

Radcliffe Office of Communications

Lilli Leggio: 617-496-3076

**Biologist Christiane Biermann Awarded Radcliffe Institute Fellowship**

*Evolutionary Scientist on Quest to Discover Genes that Generate Species Diversity*

The Radcliffe Institute for Advanced Study at Harvard University has awarded a 2001–2002 fellowship to Christiane Biermann, a postdoctoral investigator in evolutionary biology with the Friday Harbor Laboratories at the University of Washington. While at Radcliffe, Biermann will take advantage of the sea urchin genome project to determine the DNA sequences that are located on the chromosome close to a known sperm-egg recognition gene. She hopes to discover novel genes and mechanisms that generate species diversity in sea urchins.

A former Fulbright scholar, Biermann is interested in the diversity of life in the oceans. She combines laboratory and field observations with molecular genetics to investigate the evolution of marine invertebrates, ranging from variation between individuals to the origin of new species. Biermann's work has focused on fertilization barriers and the molecular evolution of a sperm-binding protein in closely related sea urchin species from the North Atlantic and North Pacific oceans.

Biermann completed her undergraduate degree in biology at the University of Münster (Germany) and Kings College (England) and earned her doctorate in ecology

—more—

and evolution from the State University of New York at Stony Brook. She was awarded fellowships and research grants by NATO, the U.S. Antarctic Program, the University of Washington's Friday Harbor Laboratories and the German Academic Exchange Service.

This year, 43 women and men were selected as Radcliffe Institute fellows. The projects were chosen for their quality and long-term impact on society. The Radcliffe Institute for Advanced Study at Harvard University is a scholarly community where individuals pursue advanced work across a wide range of academic disciplines, professions and creative arts. Within this broad purpose, the Radcliffe Institute sustains a continuing commitment to the study of women, gender and society. The Radcliffe Institute was formed in 1999 when Radcliffe College merged with Harvard University.

## BIOGRAPHY OF DR. D.B. JAMES

**Contributed by Payikat Sahadevan Asha**

Mrs. P.S. Asha, T.R.C of CMFRI, Scientist, 115, N.K. Chetty Street, Tuticorin-628001 India.

I am herewith sending a brief biography of Dr. D.B. James, the foremost Echinodermologist from India today, who has been working on echinoderms during the past 40 years and brought out 96 papers on echinoderms for favor of publication in the Echinoderm Newsletter No.26. I worked under his supervision for four years and was trained by him in the taxonomy of sea cucumbers. After his retirement in 2000, I am continuing his work on the hatchery and culture of sea cucumbers.

Dr. Daniel Bhaskar James was born in 1940 at Madras. After early education in Andhra Pradesh, he joined the Andhra University at Visakhapatnam for his B.Sc., B.Sc (Hons.) and M.Sc., degrees. During his M.Sc. course, he was awarded the University Grants Commission Merit Scholarship due to his outstanding academic record. After a brilliant academic career, he joined the Central Marine Fisheries Research Institute at Mandapam Camp (South East Coast of India) towards the end of December 1962 as a Senior Research Scholar of the Government of India under the supervision of late Dr. S. Jones who was the Director of the Institute at that time. At his suggestion, he took up studies on Echinoderms, which remains as a passion for him till today. He collected Echinoderms all along the Indian coast, The Gulf of Mannar, The Palk Bay, The Andaman and Nicobar Islands and from The Lakshadweep (Laccadives). He worked on echinoderms collected from the Gulf of Suez and the Northern Red Sea and published a detailed paper with Dr. John S. Pearse. He also worked on the echinoderms collected by the TE VEGA of the International Indian Ocean Expedition from the Red sea, Borneo, New Britain and the Solomon Islands and listed them in the Catalogue of echinoderms in the Reference Collections of Central Marine Fisheries Research Institute. He did works on taxonomy, zoogeography, ecology, conservation and management, parasites and animal associations, biotoxicity, Beche-de-mer industry, development, hatchery and culture of echinoderms. He described one new family, two new genera, five new species and several new records from the seas around India. The Andhra University awarded him the Ph.D. degree in 1979 based on his thesis on the Systematics of some shallow water asteroids, spheroids, and holothuroids of the Indian Seas.

He is the foremost Echinodermologist from India today. As an International Expert on echinoderms, he worked as FAO Consultant in the Maldives in seacucumber culture. He was involved in research, teaching, training and consultancy. Under his leadership, seed of sea cucumber *Holothuria scabra* was produced for the first time in 1988 at Tuticorin Research Centre of CMFRI. Now the techniques developed by him for seed production of sea cucumber have been adopted in Australia, Indonesia, Maldives and Solomon Islands. He served as a Convenor for the First National Workshop on Beche-de-mer in 1989 and conducted training programme for the fishermen on the improved methods of handling and processing of sea cucumbers for export in 1992. He trained a foreign scientist from Marine Science and Resources

Research Centre, Aden on resources, processing, hatchery and culture of sea cucumbers in 1992. He conducted Group Discussion on Research and Development of Indian Beche-de-mer industry in 1994. He received the Aquaculture Award instituted by the Marine Products Export Development Authority of India for his pioneering efforts on sea cucumber culture in 1995. He also received a special Award from the Fisheries Technocrats Forum, Madras for his outstanding contribution to fishery science in 1999. He was nominated as Member Secretary for the Beche-de-mer Committee by the Ministry of Agriculture, New Delhi to examine whether the ban imposed by the Government of India in 1982 to export processed sea cucumber below 75 mm in length can be lifted. He also conducted a training Programme on Farming of sea cucumbers at Kavaratti Island (Lakshadweep) under the TTC programme in 1999. He was a member of teaching Faculty for the Post Graduate programme in Mariculture and took classes regularly for the M.Sc., M.F.Sc. and Ph.D. students.. He served as examiner for the M.Sc., M.F.Sc., M.Phil. and Ph.D degree by the Andhra, Madras, Madurai Kamaraj and M.S. Universities. He is a life Member of the Marine Biological Association of India and the Andaman Science Association of India.

He had the pleasure and privilege of corresponding with the giants in the field like late Prof. H. Matsumoto, Drs. Albert Panning and Elisabeth Diechman. Prof. Matsumoto sent many of his publications and wrote in 1963 that some of his papers were published half a century ago: He was kind to make a copy of his monograph of Japanese Ophiuroidea (1917) and sent it to him. Dr. Panning sent many of his valuable papers and his revision of the genus *Holothuria* on loan and corrected his first paper, which was later published. Dr. Elisabeth Diechman not only sent a complete set of her papers but gone through some of his papers and offered valuable comments. Among living eminent personalities, Dr. David L.Pawson of the U.S. National Museum has gone through some of his papers and offered constructive criticism. He has sent many of his publications on echinoderms for which he is grateful. Maximum help was received from Miss A.M.Clark formerly of the British Museum. She sent a complete set of her reprints including her valuable Monograph on Shallow water Indo- West Pacific Echinoderms published along with Dr. Frank F. Rowe. She also sent her other big books on Echinoderms of Southern Africa and Echinoderms of Southern China. She also made available some of the rare most British Museum Publications. She has critically gone through many of his papers and offered valuable comments. She also wrote large number of letters from time to time clarifying many of the taxonomic points raised by him. These letters are carefully preserved for posterity, since there is nothing personal except for one or two personal remarks at times, often humorous: He is most grateful to her for her kindness, courtesy and help. His special thanks are also due to Dr. Frank F. Rowe formerly of the British Museum and the Australian Museum for not only sending many of his valuable publications on holothurians and asteroids but also identifying some of the holothurians, which enabled him to publish later. Finally he is thankful to Mrs. L.M. Marsh formerly of the Western Australian Museum for clarifying many of the points on asteroids and also for sending many of her valuable papers. Apart from the persons mentioned above he is grateful to Echinodermologists all over the world for not only sending their publications but encouraging him in his formative years. The list is too long to be mentioned here but he salutes all of them for their kindness and co-operation. But without the sustained and generous help received from Miss. Clark and others it would not have been possible for him to make progress in the study of echinoderms.

He loves to present papers in seminars, symposia and workshops and take active part in group-discussions and to deliver special lectures. After retirement he is devoting his time to write Monographs on the five classes of echinoderms from the seas around India. He has completed the typescript on the monographs on asteroids and at present he is working on the second monograph on holothurians. He is also looking for suitable publishers for his monographs: In his spare time he is helping Ph.D. students and research institutions in the identification of echinoderms, correcting drafts for thesis, acting as referee for scientific papers, attending scientific meetings and delivering special lectures on request.

On his personal characters, I am sincere to mention that he is simple, unassuming, ever ready to help any one who approaches him. A deeply religious and devout person who wants to help the poor. His hobbies include coin and stamp collections, reading English classics and archaeology. He is married and has two sons and two daughters.

Complete list of his publications on echinoderms is given below. Those who are interested in getting a set, may please contact him at : No. 13, Bharathiyar Street, Mehta Nagar, Madras-29 or E-mail: [baskar\\_james@yahoo.com](mailto:baskar_james@yahoo.com)

## LIST OF PUBLICATIONS OF DR. D.B. JAMES ON ECHINODERMS

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2. \_\_\_\_\_ 1968a. Studies on Indian Echinoderms - 1. Re-description of the echinoid *Breynia vredenburgi* Anderson from Andaman sea with emended description. *Ibid.*, 8(2):76-81.
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4. \_\_\_\_\_ 1969. Catalogue of echinoderms in the reference collection of the Central Marine Fisheries Research Institute. *Bull. Cent. Mar. Fish. Res. Inst.*, 7:51-62.
5. James, D.B. and R.S. Lal Mohan. 1969. Bibliography of the Echinoderms of the Indian Ocean. *Ibid.*, 15: 1-43.
6. Jones, S. and D.B. James. 1970. On the Stiliferid gastropod in the cloacal chamber of *Holothuria atra* Jaeger. *Proc. Sym. Mollusca.*, Pt.3:799-804.
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9. \_\_\_\_\_ 1971c. Studies on Indian Echinoderms-4. On the brittle star *Amphioplus gravelyi* sp. nov., and *Amphioplus depressus* (Ljungman) from the Indian coasts. *Ibid.*, 12:139-143.

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11. \_\_\_\_\_ 1973b. Note on the development of the asteroid *Asterina burtoni* Gray. *J.mar.biol.Ass.India*, **14**(2):883- 884.
12. \_\_\_\_\_ 1973c. Studies on Indian Echinoderms-5. New and little known Star fishes from the Indian seas. *Ibid.*, **15**(2):556-559.
13. \_\_\_\_\_ 1978. Studies on Indian Echinoderms-6. Re-description of two little known holothurians with a note on an early juvenile of *Holothuria scabra* Jaeger from Indian Seas. *Ibid.*, **18**:55-61.
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# AILSAS'S SECTION

## ☆☆☆ ECHINODERMS IN LITERATURE ☆☆☆

### EVO-DEVO OF ECHINODERMS ACCORDING TO HAECKEL

Contributed by J.M. Lawrence

Haeckel, E. 1876. The history of creation: or the development of the earth and its inhabitants by the action of natural causes. A popular exposition of the doctrine of evolution in general, and of that of Darwin, Goethe, and Larmarck in particular. "Every Star-fish consists of a central, small, body-disc, all round the circumference of which are attached five or several long articulated arms. *Each arm of the Star-fish essentially corresponds in its organization with an articulated worm of the class of Ring-worms, or Annelida.* I therefore consider the Star-fish as a genuine *stock or cormus*<sup>1</sup> of five or more articulated worms, which have arisen by the star-wise growth of a number of buds out of a central mother-worm. The connected members, thus grouped like the rays of a star, have inherited from the mother-worm the common opening of the mouth, and the common digestive cavity (stomach) lying in the central body-disc. The end by which they have grown together, and which fuses in the common central disc, probably corresponds to the posterior end of the original independent worms...The most important proofs, however, of the truth of my hypothesis are furnished by the ontogeny or the individual development of the Echinoderma." "The fully developed Echinoderm arises by a very remarkable process of budding in the interior of the "nurse", or which it retains little more than the stomach. The nurse, erroneously called the "larva," of the Echinoderm, must accordingly be regarded as a solitary worm, which by internal budding produces a second generation, in the form of a stock of star-shaped and connected worms. The whole of this process is a genuine alternation of generations, or metagenesis, not a "metamorphosis," as is generally though erroneously stated. A similar alternation of generations also occurs in many other worms, especially in some star worms (Sipunculidæ), and cord worms (Nemertinae). Now if, bearing in mind, the fundamental law of biogeny, we refer the ontogeny of Echinoderma to their phylogeny, then the whole historical development of the Star-fishes suddenly becomes clear and intelligible to us, whereas without this hypothesis it remains an insoluble mystery."

<sup>1</sup>A cormus is a colony.



Contributed by J.M. Lawrence

Immer, A. 2000. Nine wine myths. Esquire. May. p. 46.: "Anyone who has gotten into the bold, full-bodied genre of superintense California chardonnay knows these wines clobber fish. And the only fish I have ever had that did not work with (other) red wine was sea urchin."

Contributed by J.M. Lawrence

Clancy, T., and M. Greenberg. 1999. Power Plays: Shadow Watch. "Rick said, "The eagles prefer eating fish to anything else, but when they're really hungry or nursing a brood, they'll make a meal out of whatever they can sink their talons into...She shot a glance across the table at him. "How about urchins?" Rick smiled a little. "Them too," he said...Either of you ever hear about urchin diving?" "Pete?" Ricci said. "Only that urchins are a specialty item in foreign seafood markets. I'd assume they can bring good money."...Megan looked at him. "If somebody had told me that when I was ten, I'd be worth millions today. My big brother and I would walk along the beach and collect them off the jetties in our plastic buckets. Then we'd fill the buckets with ocean water and try to convince our parents to let us bring them home as pets. My dad would tell me to get those damned sea porcupines out of the house."..."Most of the old-time lobstermen still refer to them as whore's eggs because they mess up their traps. Clog the vents, eat the bait, even chew through the headings and lathe to get at the bait. The nasty little buggers have some sharp teeth to go with their spines."..."The urchins are found in colonies, usually in subtidal kelp beds. Once upon a time they practically carpeted the bottom of the Penobscot from the shoreline on out, so you could scoop them up without dunking your head." He paused. "Past few years have been slim pickings. Overharvesting's driven the value of the catch up into the stratosphere, and made people so protective of their zones they're baring their teeth and beating their chests if you come anywhere close to them."

The Tampa Tribune-Times, Sunday, January 16, 1994

### UNDERGROUND SALT WATER SEEPING INLAND A FOOT-A-DAY IN SOME AREAS



### FOX TROT

By Bill Amend

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Number 15 - September 2001



# SPC BECHE-DE-MER

Information Bulletin

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## Note from the coordinator

Welcome to the 15th issue of the Bulletin. The number of new subscribers and the great number of hits on the Bulletin's web-pages are proof of the increasing interest raised by our publication. Thanks to all contributors who helped me in keeping the Bulletin alive and informative.

We start the 'New Information' section with an article on the Torres Strait beche-de-mer fishery followed by two articles on the different aspects of the biology of sea cucumbers sexual reproduction. The 'Aquaculture News' column includes three original articles presenting new projects in Vietnam, Marshall Islands and New Zealand.

Information on beche-de-mer prices is difficult to get.

### *INFOFISH Trade News*

([http://www.jaring.my/infotrade/TradeNews\\_downloadpage.htm](http://www.jaring.my/infotrade/TradeNews_downloadpage.htm)) is one of the best sources of information for seafood market trends and we are thankful to them for allowing us to reproduce a table presenting beche-de-mer prices on the Asian markets. We also thank the National Fisheries Authority (NFA) of Papua New Guinea for providing information on their beche-de-mer export prices. Sharing information is the main aim of this bulletin and we encourage other fisheries departments from within and outside the Pacific region to follow NFA's example.

I draw again your attention to the 'Echinoderms Newsletter' that is available on the Web ([www.nmnh.si.edu/iz/echinoderm](http://www.nmnh.si.edu/iz/echinoderm)) and to the echinoderms forum that was created after the International Conference in Dunedin. You can subscribe by contacting [sabine.strohr@nrm.se](mailto:sabine.strohr@nrm.se) or by sending an e-mail to [listserv@nrm.se](mailto:listserv@nrm.se) and including on the first line of the message SUBSCRIBE ECHINODERM-L, your surname and first name, but no other text.

Chantal Conand

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## ☆☆☆ How I Began Studying Echinoderms. Part 11. ☆☆☆

Casey Burns - Wind Instrument Maker and Occasional Paleontologist

My 8th grade science fair project of extracting fossil pollen from coal caught the attention of the local science museum in Portland, which ran a science research center for high school students. The paleo wing was run by David Taylor, who suggested that I pursue my interest in the nearby marine Keasey Formation. We visited the legendary Mist crinoid locality - my first exposure to crinoids - and I was immediately hooked and fascinated. Thus, instead of attending sock-hops and football games, I spent my high school afternoons and weekends obsessed, crawling all over NW Oregon looking for echinoderm fossils, or working at an S. S. White sandblaster that threatened to give me chronic bronchitis! Summers all of us headed to the Hancock Field Station in Eastern Oregon where we dug up large Eocene vertebrates (boring....), and enjoyed the 60's a few years late. Hancock became the center of our universe and community. Everyone called me "Crinoid".

My college advisors frankly told me there was no point in continuing my echinoderm obsession. I should have gone elsewhere, but at PSU, a geology student was basically trained to find oil for the oil companies (not what I wanted to pursue, especially as a militant bicyclist!), so I went after other interests in and out of school and eventually created a career as a self employed maker of wind instruments, such as wooden flutes and unusual species of bagpipe. My paleontology interests waned, especially as I moved farther away from NW Oregon. During that time, unfortunately, the Mist locality was more or less illegally mined for commercial purposes - I should have been paying more attention - and any thoughts of returning to this fascination seemed remote.

Eventually, my family and I moved outside of Seattle. A few years later, a group called the Northwest Paleontological Association formed and met at the Burke Museum at UW. I quickly found myself involved as the Association's newsletter editor. Through field trips, contacts and access to the Burke's underbelly as a volunteer, I began to explore western Washington's paleontology avocationally, as well as re-exploring NW Oregon's. One day, while examining a Keasey Formation locality that had produced a largish (20cm) isopod, my wife Nancy stumbled upon a very nicely preserved spatangoid. Further collecting produced several more.

Liz Nesbitt, curator of invertebrate paleo at the Burke, suggested that I contact her friend Rich Mooi at CAS, who kindly took me under his wing to study these together, and to provide me with some necessary guidance and instruction. This was just the beginning, and was the rekindling of my fascination with these wonderful echinoderms. Since then, we have been working on several fronts together, and have enjoyed several great moments of wit, repartee and friendship. Our first paper, "An Overview of the Eocene - Oligocene Echinoderm Faunas of the Pacific NW", is currently in press.

I very much enjoy this experience of riding the fence as an avocational paleontologist, working with fellow amateur collectors who have provided me with several important specimens (all of which will end up in appropriate repositories!) or assisted in the field, and with professional paleontologists and biologists who graciously recognize the passion, value and legitimacy of my activities.

Casey Burns - Wind Instrument Maker and Occasional Paleontologist

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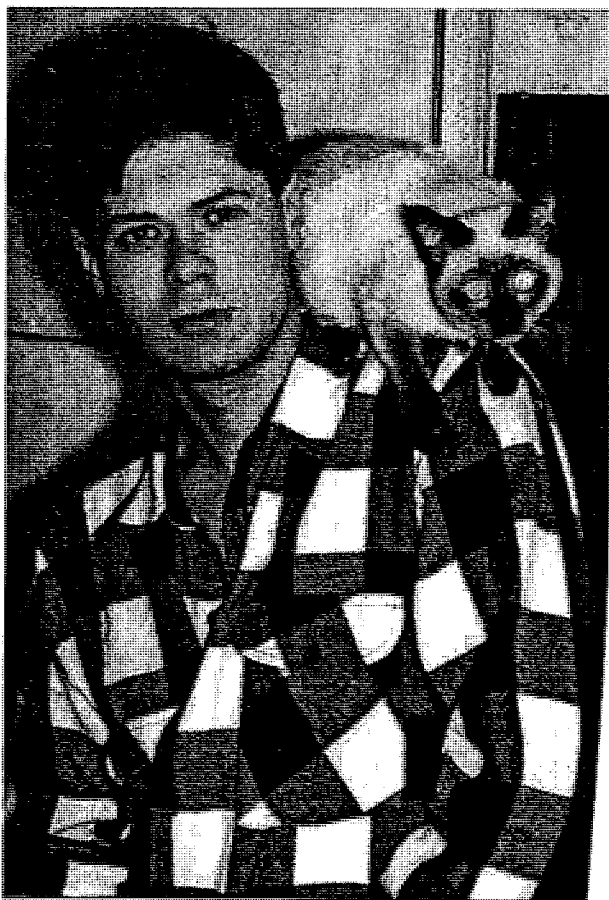
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Grigory Winter, lecturer of Cherepovets branch office of Russian Academy of Education University; post graduate student of the faculty of Geology of Saint-Petersburg University.



This picture was taken a month after the windfall of a new Echinodermata in Cherepovets (with the favorite cat Susanna on the shoulder).

I was born in the year 1969 in the Russian Far East, in Vladivostock-city. My parents are famous in Russia philologists and did a lot to provoke my interest in natural history. The first collection of minerals and rocks was presented to me before my going to school. In the year 1982 my family went to European part of Russia to the steel city of Cherepovets. By this time the collection of rocks and minerals become bigger and included some fossils. In the year 1987 I entered Vologda State Pedagogical University, the faculty of Natural Geography, where I studied paleontology and geology for 5 years, specializing in geology of the Northern European part of Russia. In the year 1993 I began to work at Cherepovets State University at the chair of natural history and ecology. At this time I described several rocks and minerals unknown in Vologda region. In 1996 I made my main windfall in the historic center of Cherepovets at the bank of river – the representative of unknown species of Ophiocistia class. In year 1997 I began to work at Cherepovets branch office of Russian Academy of Education University where larger possibilities for

creative work were given. Working there I take post graduate courses at the faculty of Geology of Saint-Petersburg State University.

Due to poor investigation of Vologda region the sphere of my interest is very wide and includes many questions in geology and paleontology.

The spheres of the interest:

- description of not investigated semiprecious rocks and minerals
- founding and description of rare representatives of sea fauna of Carbon
- reconstruction of the found fossils (team-work with Mr. Roman Fedorov - the head of Cherepovets University Biological & Ecological laboratory)
- investigation of the modern relief of Vologda region forming process due to plate-tectonical model of construction of lithosphere (taking Severnie Uvali Hills – the largest hills of the North of European part of Russis as example)
- analyses of the mould of the forefoot of Notosaur found in Cherepovets in the summer of 2001.
- studying of phylogenetic table of Echinodermata due to the windfall of *Augustina winteri*

The results of my researches are published in the bulletins of the scientific works of Cherepovets scientists and in the report of regional geological department. At the end of 2001 year a special brochure “Conception research of Severnie Uvali Hills” was published in the local State University (Cherepovets).

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# New Echinodermata (Ophiocistoidea) found on the North-East of Russian Plate (Europe part of Russia)

## I. The object of research

The object of research is oral side of Ophiocistoidea the maximum diameter of which is 105 MM, with completely undamaged Aristotle lantern and other structures. This windfall has great science importance as the number of found fossilized Ophiocistia is very few due to small number of representatives of this class in general. The class of Ophiocistia is a typical transition link which is vaguely entered in the list of geological history due to quick morphological changes. They combined the features of ancient regular sea-urchins, starfishes and brittlestars. The distinctive features of Ophiocistia is that this class is the link between the organisms from sedentary to free style of life. The nearest ancestor of Ophiocistia is probably Edrioasteroidea. After the death of the organism the shell usually comes apart into calcium plates. The specimens found before this Ophiocistoidea had lower sizes and were not in such undamaged state comparing with the one found 600 km to the North from Moscow on the North-East of Russian Plate (Europe part of Russia).



## **II. Time and place of windfall**

On the 8<sup>th</sup> of August of 1996 on the bank of Jagorba river (Cherepovets), which is forming together with Sheksna river the largest artificial storage in the world, was found quartzite copy of large Echinodermata. The windfall was made due to the lowest level of the water in the river of all the seasons of the last century. Thanks to it a lot of stones and minerals laying at the bottom were seen on the surface. The place of windfall is practically in the center of metallurgist industrial city; which is 100 meters to the South from the Severni bridge (The Northern Bridge) which connects two parts of city Cherepovets.

## **III. The history of investigation of the windfall**

I found this Echinodermata being a teacher of natural History of Cherepovets State University. At that time I was a specialist in Paleozoic paleontology but not a good specialist on the field of Echinodermata. Great help in taxonomy identification of windfall was given by Doctor of Biology, specialist of invertebrates Mrs Tatijana Ermoshenkova. It was her who identified this Echinodermata as representative of Class Ophiocistoidea. For 2 years the head of University laboratory of Zoology Mr. Roman Fedorov and I have been studying the morphological peculiarities of this windfall.

In the spring of 1998 the windfall was named *Augustina winteri* and it was included into the State list of new found invertebrates of Russia. The article about the peculiarities of *Augustina winteri* was published the same year in Cherepovets (Annual collection of researches of young scientists). The next 3 years the structural reconstruction and some other technically difficult investigations took place in the laboratories of Cherepovets State University under the leadership of Doctor of technical science Mr. Fedorchuk.. The main result of these investigations was the age determination of *Augustina winteri* – it lived 320 –330 millions of years ago. Thus we can see that the windfall belongs to middle Carbon period. It is extremely interesting peculiarity of this windfall as all before described in literature *Ophiocistia* lived not later than Devon. It was also confirmed by founding of Brachiopod *Brachythyryna* sp. in the same quartzite copy with *Ophiocistia*. Two clamshells of *Brachythyryna* sp. were seen in full and the fragments of one more *Brachythyryna* sp. were found near the Aristotle lantern of *Augustina winteri* which tells us about the fact that most probably this Echinodermata was a predator and made short work of her victims like nowadays large tropic starfishes. Thanks to undamaged state and large size of the windfall we managed to reconstitute the details of morphological construction of oral side of *Augustina winteri*, in spite of the fact that 1/3 of the fossil is destroyed by erosion.

#### **IV. Biofacies analyze: The way of life and peculiarities of burial.**

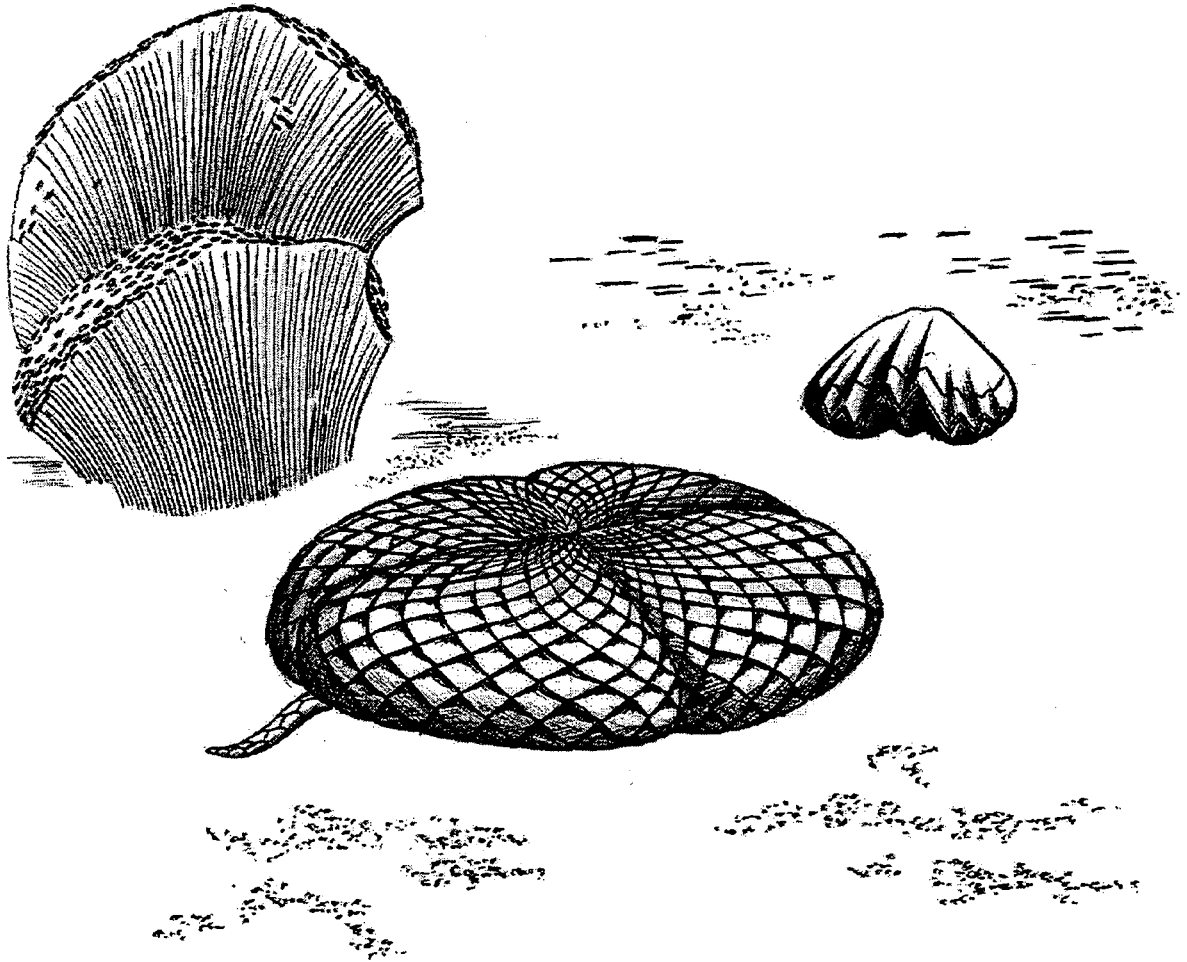
Found *Ophiocistia* was enclosed into the quartzite mould of 130 x 225 MM size. Biofacies analyses or the peculiarities of disposition of *Augustina winteri* in the mould and the characteristics of the mould let us make some findings both of possible ways of life of fossil Echinodermata and undamaged state of the windfall.

Most probably it is possible to state that *Augustina winteri* lived on the shallow shelf lower the underwater built-up terrace where the streams grow weak making sand "saucer" among firm or clay soil. Investigated *Ophiocistia* lived in such a "saucer" the form of which was saved by the quartzite mould appeared by metamorphization (change) of quartz sand grains into rock. Like nowadays living representatives of sea-urchins *Augustina winteri* lived into the upper layer of the soil getting out of it only in case of changing its usual living conditions. With the current of water *Ophiocistia* received plankton through the special passage the track of which is seen in the mould. For catching plankton *Ophiocistia* used a pair of highly developed ambulacral tubes having external skeleton. To our regret they are seen only in fragments in the fossil condition. It was finding larger prey which shared econiche with *Ophiocistia* by slowly moving in the soil and breaking hard shells by teeth of Aristotle lantern. It is easy to imagine the strength of jaws knowing that the material covering each tooth (it is saved in the fossil condition turned into opal) has the thickness more than 1 MM. Besides that there were found wreckage of brachiopod *Brachythyrina* sp. near the mouth of *Ophiocistia* proving our conclusions.

Making deduction out of above mentioned we concluded that *Augustina winteri* was buried in living condition due to which fact there is undamaged state of her fossilized remains. If *Ophiocistia* died before burial the lime plates composing it would be seen separately, not in the form of the whole shell as they had joining of muscular or other tissue. Most probably sand "saucer" in which *Augustina winteri* lived was covered by landslide of muscular tissue and Echinodermata died not being able to get out. Thanks to this sad event we have an excellent specimen for studying.

**Picture 1**

**Expected appearance of *Augustina winteri* and associate fauna  
(corallite *Chaetetes* and brachiopod *Brachythyryna*)**





## V. Morphological structure and peculiarities of oral side of *Augustina winteri*

Thanks to undamaged state fossil *Ophiocistia* remained the main part of its morphological structure. The main peculiarity of *Augustina winteri* is a pronounced radial-beam symmetry L<sub>8</sub>P. This quality is an important taxonomic feature as the most part of Pelmatozoa Echinodermata have the radial-beam symmetry L<sub>5</sub>P. This quality of fossil *Ophiocistia* was taken from the following details of its structure:

- Mouth of *Augustina winteri* consists of Aristotle lantern which looks like a pyramid out of eight dental plates. The length of each dental plate is 12–14 MM.
- There is perignathic girdle around the mouth. On the perignathic girdle there are pore-pairs for tube-feet near the bottom of the dental plates. The “foot- parts” of the pore-pairs for tube-feet are seen behind the perignathic girdle till the end of the oral side of *Ophiocistia*. They divide this side into 8 ambulacral zones and 8 interambulacral zones. This fact proves our presupposition of radial-beam symmetry L<sub>8</sub>P of *Augustina winteri*.
- Besides the ends of oral side represent not a smooth round or oral but shaped fans in the form of 4 smooth fans. These cuts couldn't be possible in case of other symmetry.

The other peculiarities of the given organism are:

- Perignathic girdle consists of chess order situated calcium plates having considerable angle of inclination regarding horizontal level. The angle of inclination of these plates is so large as they look like a number of inclined hollows submerged into the surface of oral side for 2- 3 MM.
- The pore-pairs for tube-feet are situated between the inclined hollows of perignathic girdle. These pore-pairs are also seen on the ambulacral zones looking like the “foot-tracks” situated with the interval of 1 MM. The diameter of them is also 1 MM.
- The ambulacral zones have special anatomic peculiarity – they are not situated in one level with interambulacral zones but graphically overhanged above the last. These overhangs can be up to 5 MM. To our regret this peculiarity of ambulacral zones was the reason of their damage during the mechanical erosion of fossil *Ophiocistia*. However the situation of ambulacral zones is seen by the pore-pairs for tube-feet as they are heavily extended into the oral disk. The difference in the construction of *Ophiocistia Augustina winteri* comparing with sea-urchins is in the way the ambulacral zones look like – in the case of *Augustina winteri* we can see ambulacral zone like massive calcium bars while sea-urchins have the ambulacral zones in the form of 2 rows of plates.

Interambulacral zones are much wider comparing with ambulacral zones. Interambulacral zones consist of 3 rows of large (up to 5 MM) calcium plates deposited by it's ends on each others like tile. In each of these plates there are seen a lot of small holes one of which is the largest and is situated in the center. Probably these holes served for maintenance of osmosis pressure of water in the organism and appeared during the process of growing of calcium plates. Some of the scientists thinks that these holes are the sex pores but this point of view is not current opinion.

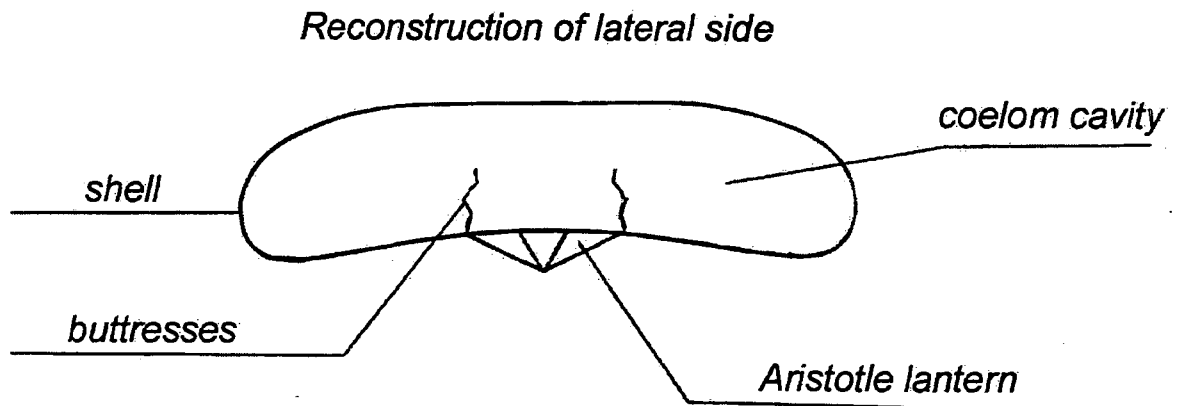
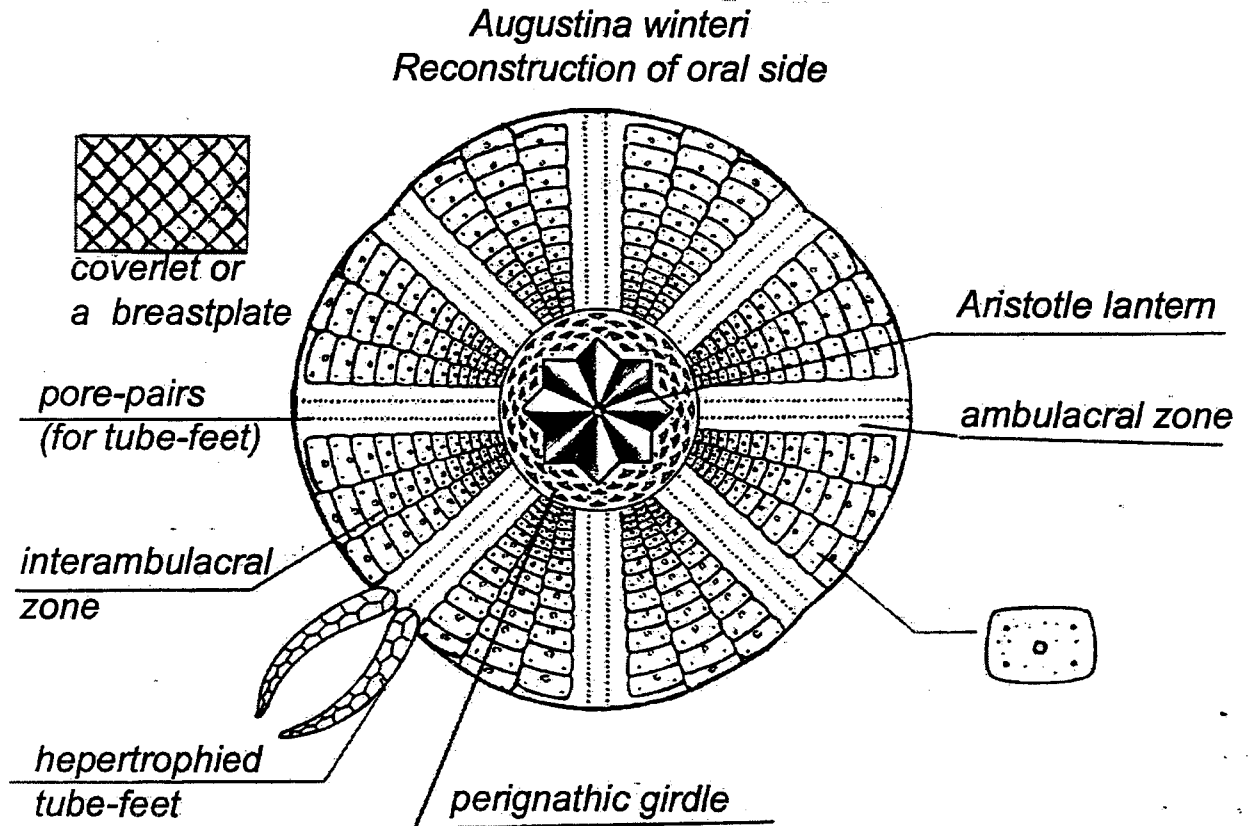
One of the interesting morphological details of *Augustina winteri* is the remaining of the coverlet or a breastplate protecting the structures of oral excluding Aristotle lantern. This coverlet was reduced during *Augustina winteri* life. Probably, like class Ophiuroidea *Augustina winteri* gradually lost its coverlet during some period of time due to its hard abrasion as it crawled on the bottom. The degree of abrasion of coverlet indicates the age of organism (like in the case of class Ophiuroidea). The less size has the remaining part of the coverlet the older is the organism. Biofacies analyses opened 2 fragments of such coverlet. The coverlet consists of a large number of little squared scales situated in the chess order. These scales have no holes as they consist not of calcium being the blistering on the skin like in many representatives of Ophiuroidea class.

On the right side of the photo you can see the fragments of blistering quite distinctly. The holes for foot tubes are twice smaller on the coverlet comparing with the ambulacral zone. On this coverlet the pore-pairs are also seen but they are not between the scales transfixing them through.

Thanks to the fact that the quartzite mould was broken during erosion the lateral side is seen. Due to it the buttresses are observable. In Ophiocistia *Augustina winteri* the upper and lower surface of the test are connected by an often extensive series of buttresses and pillars. These are purely structural and reinforce the test. These buttresses are shown on the picture with reconstruction of lateral side.

The main distinction of class Ophiocistoidea as you know from the other classes of free living Echinodermata is that they have one or several pairs of hypertrophied tube- feet. The other found before Ophiocistia similar pairs of tube-feet had the length up to  $\frac{1}{2}$  of diameter of oral disk of the organism. They also had surface skeletonization by calcium plates. The similar construction had Ophiocistia *Eucladia jonstoni* reconstructed by Russian scientist Fedotov. Hepertrophied tube-feet helped in spatial motion and in nutrition. Unfortunately erosion rubbed sore hypertrophied tube- feet of *Augustina winteri*. The only remaining part (3 calcium plates) forms a straight line with the oral disk of Ophiocistia. It gives us grounds to suggest that *Augustina winteri* also like other Ophiocistia had this interesting peculiarity. Due to this reason the hypertrophied tube-feet of *Augustina*

winteri are shown in the picture with reconstruction admittedly (it is the only anatomic detail which is shown in the picture conceivably).



## VI. The main deductions

After studying all these morphological details of construction of the found Ophiocistia we can make the following deductions:

- all described before reports that *Augustina winteri* has significant distinctions comparing with the other described in the literature *Ophiocistia Eucladia jonstoni*, *Sollasina*, *Volchovia*.
- First of all the symmetry of *Augustina winteri* is L8P which confirms the sibling connection of class Ophiocistoidea and class Ophiuroidea. One

more detail confirms this connection – coverlet of living now Ophiuroidea was the same as *Augustina winteri* had.

- Many details of construction of oral side of *Augustina winteri* agree with the regular old sea-urchins like in the case of *Archaeocidaris wortheni* (Cidaroidea) – the presence of perignathic girdle around Aristotle lantern; the construction of plates in interambulacral zone is also very much alike (the form of the plates and the sizes of them).
- Extremely important point of investigation was dating of *Augustina winteri*: it lived in the middle Carbon 320–330 million year ago (according to the results of radiocarbon measurements). The dating of *Augustina winteri* clashed with dating of *Archaeocidaris wortheni* (Cidaroidea) which is very interesting!
- Before this windfall it was used to consider Ophiocistoidea as dead-end branch of phylogenetic table. After the investigation of *Augustina winteri* we made diversification of this point of view and came to the conclusion that class Ophiocistoidea is the transitional link between Edrioasteroidea and all free living Echinodermata with the exception of holothurian.
- It is necessary to underline that *Augustina winteri* lived 50 million years after the dating of other Ophiocistoidea.

Most probably the class of Ophiocistoidea died out as  $\frac{3}{4}$  of all Echinodermata in the beginning of Perm due to the abrupt change of the climatic regime. We presuppose it due to the fact that *Augustina winteri* lived 50 million years after the dating of other Ophiocistoidea. Besides it had some progressive for evolution of Echinodermata details of construction can be seen now in the orders of Lepidocentroida and Camarodonta.

All above mentioned informs that the investigation of Ophiocistia is a prior task for the phylogenetic table of Echinodermata.

## OBITUARY

----- Original Message -----

From: "Jean-Pierre FERAL" <feral@OBS-BANYULS.FR>

To: <ECHINODERM-L@NRM.SE>

Sent: Thursday, June 07, 2001 10:46 AM

Subject: Alain Guille died last monday

Dear Colleagues

Alain Guille died of lung cancer on June 4th 2001, at the age of 64 years, surrounded by his wife and children. For several years, he had made a bold stand against his dangerous illness.

Appointed by Claude Lévi at the Laboratory of Biology of Marine Invertebrates and Malacology in 1973, Alain Guille was nominated deputy director at the Natural History Museum in 1979, and director of the CNRS unit of research # 699 from 1986 to 1988. He was professor at the University Pierre et Marie Curie (Paris 6) and director of the Laboratory Arago of Banyuls-sur-mer from 1989 to 1999. His entire scientific career was devoted to the complementary aspects of oceanographic and biological research on the littoral and offshore benthic life of marine animals. He was recognized world wide as a specialist in systematics of echinoderms (Ophiuroids).

The funeral will take place on Saturday June 9th, at 9 a.m., at the crematorium of the Père Lachaise cemetery in Paris.

Jean-Pierre Féral

Jean-Pierre FERAL

Observatoire Oceanologique

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**Guille, A.** 1965. Exploration en soucoupe plongeante Cousteau de l'entrée nord-est de la Baie de Rosas (Espagne). Bull. Inst. Océanogr. Monaco No. 1357 : 1-12, 3 pls.

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