THE ECHINODERM NEWSLETTER

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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.

From Edward Forbes (184
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Communication among scientists is extraordinarily important. As the number of scientists working on echinoderms is not large, a journal or society to facilitate communication has never developed. Thus the founding of the Echinoderm Newsletter in 1968 by David Pawson and Maureen Downey of the Smithsonian Institution was an important contribution to progress in echinoderm biology. David noted in the first newsletter "We believe that the newsletter should be helpful in providing an informal means of communication between specialists." His belief was well founded as the issues over the years have provided not only information itself but have led to interaction and collaboration of echinoderm biologists. Let us recognize this anniversary with joy!

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ADAMS, NIKKI L. - effects of and defenses against ultraviolet (UV) radiation on reproduction and development of marine invertebrates; currently examining whether UV affects gametogenesis or accumulation of cellular defenses against UV radiation such as mycosporine-like amino acids and small molecule antioxidants in the gonads and gametes of the green sea urchin *Strongylocentrotus droebachiensis*; investigating how these defenses might protect embryos and larvae of echinoderms against UV radiation.

AGATSUMA, YUKI - herbivorous-algae interaction; ecological studies on population dynamics of the sea urchin *Hemicentrotus pulcherrimus*.

AHEARN, CYNTHIA - taxonomy of South African holothuroids; checklist of North American echinoderms for the American Fisheries Society with Chris Mah, Susan Hottenrott, Phil Lambert and Chuck Messing.

ALBI, YVONNE Z. - a Paleocene echinoid from the Santa Monica Mountains, Los Angeles County, California. A newly noted schizasterid.

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

ALLEN, JOHN A. - deep-sea benthos of the Atlantic.

ALLISON, WILLIAM R. - 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

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

ANDERSEN, AASMUND - study of chemically induced predator responses on *Strongylocentrotus droebachiensis*.

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 C. - 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 E. - commercial potential of Bech de Mer in New Zealand; enhancement of red rock lobster (effects of the captive environment on behaviour).

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

AUSICH, WILLIAM I. - early radiation and phylogeny of crinoids; crinoid classification; crinoid taphonomy; Lower Mississippian crinoid macroevolution.

BALSER, ELIZABETH J. - mechanisms of asexual reproduction in echinoderm larvae.

BANGI, HELEN GRACE P. - culture and management of the sea urchin *Tripneustes gratilla*.

BERENTS, PENELLOPE B. - collection manager of marine invertebrates at the Australian Museum.

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 F. - evolution and ecology of modes of development in echinoids

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

BILLET, DAVID S.M. - environmental impact on the deep sea; taxonomy of the genus Mesothuria (Holothurioidea).

BIRENHEIDE, RUDIGER - morphology, physiology and biomechanics of crinoids.

BIRKELAND, CHARLES E. - coral reef management.

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

BLAKE, DANIEL B. - Cretaceous asteroids of Texas; Ordovician stelleroids; stelleroids of Seymour Island.

BLUHM, BODIL A. - age determination.

BLUHM, HARTMUT - Holothuroidea as possible indicators for physical disturbance impacts in the deep sea.

BOCKELIE, JOHAN F. - Rhombiferan cystoids, Scandanavia.

BONASORO, FRANCESCO - regeneration of crinoids.

BORZONE, CARLOS A. - Matinhos sandy beach replenishment and its impact on the benthic macrofaunal nearshore community; echinoderms of Parana's coastal waters, Brazil.

BOSCH, ISIDRO M. - UV-B effects on embryos and larvae of Antarctic echinoderms during springtime ozone depletion.

BOUDOURESQUE, CHARLES F. - 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 E. - Bioproductual properties (size-age structure, longevity, growth, recruitment, elimination) of local populations of echinoderms and molluscs inhabiting far-eastern coastal waters of Russia.
BRETON, GERARD - regional fauna of fossil asteroids (Cretaceous, France); asteroid phylogeny.

BREY, THOMAS - polar echinoderm population dynamics; Antarctic ophiuroid growth; Antarctic asteroid food; Antarctic holothuroid metabolism.

BROWER, JAMES C. - taxonomy, functional morphology, paleoecology, ontogeny and phylogeny of Ordovician crinoids and blastozoans from the northern midcontinent of North America.

BUITRON-SANCHEZ, BLANCA E. - Cenozoic echinoderms (Stelleroidea and echinoidea) from Baja California, Mexico.

BURCH, BEATRICE L. - working on forams in gut of Chaetodiadema pallidum and in the surrounding sediments.

BURNS, CASEY - three possible new species of echinoids from the Eocene of Oregon at the Burke Museum in Seattle.

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

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

CALTAGIRONE, ANGELA - sea urchin aquaculture.

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 microsatellite analysis of homozygosity in an inbred line of sea urchins.

CAMPBELL, ALAN - sea urchin population dynamics ecology and fisheries.

CAMPBELL, ANDREW C. - zoogeography of Indian Ocean echinoderms.

CAMPBELL, DAVID B. - feeding behavior of Asterias.

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

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

CHEN, CHANG-PO - ontogenesis of skeletal plate patterns, gonad, and gonapores in the progenesis Sinaechinocyamus mai.

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

CLARK, ROGER N. - seastars of the Aleutian Islands, Alaska (North Pacific) of the families Pterasteridae, Solasteridae, Myxasteridae, Goniasteridae.
CLOUSE, RONALD M - taxonomy and behavior of *Bohadschia marmorata* and *B. bivittata* (Holothuroidea) from Micronesia.

COLON-JONES, D. ELIZABETH - rearing *Diadema* larvae; rearing coral larvae; studying the sediment regime on Biscayne National Park reefs; examining calcification rates of corals.

CONAND, CHANTAL - Beche-de-Mer Bulletin 10 (No. 9 -1997); holothurian fisheries (Indian Ocean, Madagascar); asexual reproduction in sea cucumbers; population biology of the sea urchin *Colobocentrurus atratus*; biodiversity of reef echinoderms (La Reunion).

CREASER, EDWIN P. - management of green sea urchin resources of State of Maine.

CRUMP, ROBIN G. - asteroid development and ecology.

CUNHA DE JESUS, DORA MARIA - ecologic and biogeographic considerations on the Portuguese echinoderm fauna.

CUTRESS, BERTHA M. - deep sea Holothuroidea (Echinodermata) of Puerto Rico.

DAFNI, JACOB - echinoid growth.

DALBY, JR., JAMES E. - growth of arctic ophiuroids.

DAVOULT, DOMINIQUE - studies on ecology and functioning (fluxes of carbon and nitrogen at the water-sediment interface) of coastal benthic communities in the English Channel and the North Sea, with special reference to a dominant species, the ophiuroid *Ophiothrix fragilis* (Abildgaard); studies of interactions between physics (hydrodynamism) and biology (behaviour) for nutrition (suspension-feeding) and recruitment (settlement of larvae on adults).

DAYTON, PAUL K. - benthic ecology.

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

DE WIT, WALTER M.J. - fossil echinoderms in fluvialite and ice-age deposits of Holland.

DEAN, JULIETTE - Ordovician divergence of asteroids and ophiuroids.

DEARBORN, JOHN H. - functional morphology of ophiuroid tube feet; identification of Gulf of Maine and Antarctic ophiuroids and crinoids from collections on hand.

DEBENHAM, PATTY - population genetics of the red sea urchin *Strongylocentrotus franciscanus*.

DEVIN, MICHAEL G. - benthic species diversity of the Bahamian slope (depth 300 m to 900 m) - the fauna is dominated by echinoderms, particularly echinoids.

DIEHL, WALTER J. - effects of environmental stress on multilocus heterozygosity-growth relationships in invertebrates.
DOBSON, WILLIAM E. - 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 Y. - mechanisms of regeneration, their formation and changes in individual development of marine invertebrates.

DOMINGUEZ, PATRICIO - working on early echinoderms, especially Cambrian and Ordovician Pelmatozoans and Carpoids from Spain.

DONOVAN, STEPHEN K. - Tertiary crinoids of Barbados and Carriacou; Miocene echinoids of Grand Cayman; the fossil record of asteroids in the Antillean region; graduate students currently documenting echinoid faunas from the Eocene (Jamaica) and Pleistocene (Jamaica and Barbados) of the Caribbean.

DRUMMOND, ANNE E. - intra and interspecific agnostic behaviour in echinoids; wave action and consequences for *E. mathaei, S. variolaris, D. savignyi*.

EBLE, GUNTHER J. - evolutionary dynamics in disasteroids, holasteroids and spatangoids; post-metamorphic spatangoid development; phylogeny of disasteroids, early holasteroids and early spatangoids.

EEKELERS, DIRK - biodiversity and distribution of asteroids on the coral reefs of Kenya.

ELISEIKINA, MARINA G. - mechanisms of regeneration, their formation and changes in individual development of marine invertebrates.

ELLERS, OLAF W. - growth of sand dollar teeth; catch collagen.

EMLET, RICHARD B. - functional morphology of echinoderm larval evolution of echinoid life histories and development.

ETNIER, SHELLEY - comatulid crinoids.

ETTENSOHN, FRANK R. - Systematics, paleoecology and functional morphology of the pelagic crinoid *Saccocoma*; Paleoecology of a Late Ordovician crinoid garden community; Paleoecology of a Late Ordovician edrioasteroid firmground.

EVDOKIMOV, VLADIMIR V. - research of reproductive process of sea urchins; reproduction and development of marine invertebrates; influence of monochromatic light on the sea urchins reproductive process.

FARMANFARMAIAN, A. VERDI - growth hormone and nitrogen retention.

FAY, ROBERT O. - Ovachita Belt bibliography.

FEDER, HOWARD M. - 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 genetic structure and evolutionary processes (mainly in echinoids - annelids and molluscs also used).

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

FERNANDEZ, CATHERINE - growth, nutrition and biochemical composition of sea urchin Paracentrotus lividus in rearing fed with different types of artificial food.

FLAMMANG, PATRICK - adhesive systems of echinoderm podia; ultrastructure, biochemistry of the adhesive and deadhesive substance, and adhesive force measurements.

FOLLOSCO, MINDA P. - artificial culture of economically important sea cucumber.

FORET, TIMOTHY W. - regeneration rates of Luidia in the field and the energetics of regenerative development; have begun thesis examining the prevalence of subcuticular bacteria in Gulf Coast (Florida) asteroids.

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

FOX, DAVID J. - analysis of articulation in the arms of Ophiocoma echinata and Ophiocoma wendti.

FRANKEL, EDGAR - coral reef lagoon sedimentation; coastal lakes, N.S.W.; volcanic ash - Mediterranean Sea; tectonics - eastern Mediterranean sea (ODP160).

FREEMAN, STEVEN M. - impact and population dynamics of seastar predation on sublittoral communities. In particular, Astropecten irregularis on soft-bottom communities and Asterias rubens on commercial mussel beds, off the coast of Anglesea, North Wales; the relationship between the sea star Astropecten irregularis and its commensal polynoid Achole astercola.

FUJITA, TOSHIHIKO - biology of Coscinasterias acutispina; ecology of Recent and fossil Ophiura sarsii; taxonomy of Japanese ophiuroids and asteroids.

FUKUYAMA, ALLAN K. - 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 D. - 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.

GARRISON, ROB - sea urchin aquaculture.
GEBRUK, ANDREY V. - deep-sea holothurians (order Elasipodida and, in part, Fam. Synallactidae)

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

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

GIBSON, MICHAEL A. - continuing work on biotic interactions of Lower Devonian of West Tennessee; also studying traces of echinoids from the Coon Creek Formation (Cretaceous) and the tiering relationships present within the ichnofauna.

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

GINANOVA, TALIA T. - mechanisms of muscle regeneration.

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 development.

GLUCHOWSKI, EDWARD L. - Fammenian crinoids from the Holy Cross Mts, South Poland.

GOGGIN, LOUISE C. - biological control of the northern Pacific seastar; *Asterias amurensis* in Australian waters.

GOLDBERG, ARTHUR S. - investigating antiarthritic properties of echinoderms.

GONGADZE, GURAM - Late Cretaceous and Paleogene echinoids of the Caucasus (classification, paleobiogeography, stratigraphy).

GOODING, RICHARD U. - Animals associated with Caribbean diadematids; animals associated with diadematid echinoids, worldwide.

GRABOWSKY-KAAIA, GAIL L. - Albatross recolonization project via the Audubon Society and HI Dept. of Fish and Wildlife.

GREENSTEIN, BENJAMIN J. - taphonomy of crown-of-thorns starfish; comparative taphonomy of Caribbean reefs; mode of formation of Pliocene shell beds.

GROSJEAN, PHILIPPE - biology of the European violet sea urchin *Paracentrotus lividus* under intensive land-based aquaculture.

GROVES, CATHY - *Heliaster* biogeography and systematics.

GUENSBURG, THOMAS E. - edrioasteroids, early crinoids, paleoecology of echinoderms.

GUERRAZZI, MARIA C. - natural history and the feeding behavior of the starfish *Echinaster brasiliensis*. 

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GUILLOU, MONIQUE - Reproduction/Recruitment: responses of sea-urchin population to environmental changes; Biodiversity: seaweed-urchin interaction.

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

GUTT, JULIAN - polar benthos ecology.

HADEL, VALERIA FLORA - respiratory metabolism of Chiridota rotifera (small holothuroid found in beaches of coarse sand).

HAGEN, NILS T. - 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.

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

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

HAVARDSSON, BJORGOLFUR - the effect of caroteins 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 echiniculture.

HEINZELLER, THOMAS E. - 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 E. - 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.

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 P. - preparation of a field guide to the echinoderms of the Galapagos Islands.

HIGHSMITH, RAYMOND C. - intertidal studies in Cook Inlet, Alaska.

HILL, ROBERT B. - mechanical properties of holothurian muscle and body wall.

HOBERG, MAX K. - investigating the diet of the sea star Pycnopodia helianthoides from eelgrass.
habitats in Prince William Sound following the Exxon Valdez oil spill.

HODGSON, ALAN N. - spermatozoan morphology of Patiriella.

HOFFMAN, JENNIFER - the effects of ultraviolet radiation on marine invertebrate embryos and larvae, with a focus on echinoids.

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

HOOPER, ROBERT G. - aquaculture of Strongylocentrotus drobachiensis.

HOROWITZ, ALAN STANLEY - bibliography of the fossil Blastoidea and database of blastoid taxa (with J. Waters).

HOSHI, MOTONORI - molecular mechanism of sperm-egg interactions in starfish and sea urchins; structure and function of glycosphingolipids in starfish and sea urchins, 1-methyladenine signal transduction in starfish oocytes.

HOTCHKISS, FREDERICK H.C. - echinoderm pentamerism; teratology of sea stars; Paleozoic ophiuroid morphology, evolution and classification; isolated ophiuroid vertebræ 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 I. - systematics and cladistic analysis of Ophiomusium and Ophiosphalma; preliminary notes on a troglobitic ophiuroid from the Bahamas.

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 - taxonomy of Japanese Ophiuroidea; SEM observation on disk granules of Ophiuroidea; vertebra form of Ophiuroidea.

IVY, W. GRISILDA - seed production and sea ranching of sea cucumbers.

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.

JACOBSSEN, NANCY A. - identification and logging of occurrences of invertebrates, vertebrates and geologic features in the Monterey Bay; working especially with astroidea analysis (WWW images and information will be available in the near future.

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

JAGT, JOHN W.M. - Latest Cretaceous-early Palaeogene echinoderms (holothurians excepted) from
type area of the Maastrichtian Stage; late Maastrichtian echinoderm 'lagerstatte' with bourgueticrinine crinoids and ophiolepidid and ophiacanthid ophiuroids; high-diversity ophiuroid faunas of Campanian and Maastrichtian age from northeast Germany (with M. Kutscher).

JAMES, DANIEL B. - Seed production in sea cucumbers.

JAMIESON, GLEN S. - sea urchin abundance surveys; near-shore community population dynamics.

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

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

JELL, PETER A. - Australian Palaeozoic echinoderms. Just completing a volume of Memoirs of the Queensland Museum which will include:- Silurian and Devonian crinoids of Victoria; Lower Devonian echinoderms (crinoids, blastoids asterozoans) of the Bokkeveld Series in South Africa; Upper Devonian crinoids of the Canning Basin, WA; latest Ordovician to Devonian carpoids of Victoria (4 papers with Marcello Ruta); Carboniferous and Permian crinoids of Australia (2 papers with Gary Webster).

JOHNSON, SONKE - absorption spectra of echinoderm visual pigments.

JUINIO-MENEZ, ANNETTE R. - culture and population genetics of marine invertebrates (sea urchin); development of mass culture techniques for Tripneustes gratilla.

JUNQUEIRA, ANDREA O.R. - population dynamics of echinoids.

KAMMER, THOMAS W. - web page: http:\www.geo.wvu.edu/-kammer/welcome.htm

KASYANOV, VLADIMIR L. - cellular mechanisms of reproductive strategies of marine invertebrates.

KAWAUCHI, GISELE YUKIMI - reproduction and dispersion - apodous holothurians.

KELLY, MAEVE S. - feasibility of commercial echinoculture in Scotland (Psammechinus miliaris); echinoderm/subcuticular bacteria symbioses.

KERR, ALEXANDER M. - ecology, character evolution, diversification and molecular systematics of aspidochirote holothuroids.

KEUSKAMP, DOM - recruitment of the endemic New Zealand echinoid Evechinus chloroticus (Echinometridae). Specifically focussing on settlement variability, natural recruitment variability, and experimental manipulation of processes operating immediately post-settlement (using cultured recruits), as well as aspects of development and the chemical ecology of settlement. Especially interested in the effects of sediment on survivorship during and after and settlement, and techniques available to determine the nature of these effects. Also, the peculiarities of a marine reserve (as my major study site). Determining the relative influence these processes have on recruitment at several scales may have implications for the (small) roe fishery in New Zealand.

KLINGEN, THOMAS S. - 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.

KOGO, ICHIZO - Class Crinoidea - taxonomy.

KRISHNARAJAH, PADMINI - holothuria fishery in Jaffna lagoon, northern part of Sri Lanka.

KURIHARA, TAKEO - activity rhythms of starfish; distributional patterns of starfish.

KYTE, MICHAEL A. - ophiuroid (worldwide) and asteroid (NE Pacific) taxonomy and behavior; sea cucumber ecology.

LAMBERT, PHILIP - description of two new species of Pentamerina and a Phyllophorid (Holothuroidea) from the west coast.

LANDEIRA, ANA MARIA - characterization of a Ca2+-atpase from sea cucumber muscle.

LANE, DAVID J.W. - The Echinodermata: a biological tool for the control and protection of marine benthic environments in Singapore waters.

LANE, N. GARY - completing three papers on Famennian (latest Devonian) crinoids from China, Britain, and Germany.

LAWRENCE, JOHN M. (University of South Florida) with Stephen Watts, James McClintock and Anne Boettger (University of Alabama at Birmingham)

El Nino mass mortalities of the starfish Luidia clathrata and the sea urchin Lytechinus variegatus in the eastern Gulf of Mexico, 1998. Heavy rains during the spring of 1998 have diluted the sea water resulting in mass mortality of Luidia clathrata in Tampa Bay, Florida. L. clathrata has been monitored in Tampa Bay since 1967. It has survived past decreases in salinity to 16-17 o/oo resulting from typical summer rains. In spring 1998 El Nino associated rains decreased the salinity to 14 o/oo salinity in shallow parts of the Bay to ca. 3 meters, resulting in elimination of the population. Although dead and dying individuals were seen, it is possible others may have migrated to deeper waters. Luidia clathrata continued to be found in the Bay at depths of 5 meters or more. High amounts of fresh water into the shallow bays near the Florida panhandle cities of Port St. Joe and Panama City killed large numbers of Lytechinus variegatus. Immigration has resulted in some re-population, but many of these individuals show evidence of spine loss and subsequent spine regeneration. This mass mortality of echinoderms resulting from decreased salinity is similar to that noted near Caracas, Venezuela several years ago.

LE MENN, JEAN - Paleozoic North-African crinoids (calyx and dissociated columnals); benthic communities, polynomorphes and medium to high frequencies cycles.
LEISMAN, JULIANNE - recruitment study of brittlestars in the Banana River; also, aspects of regeneration.

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

LESSIOS, HARILAOS A. - molecular phylogeny of Diadema, gene flow in sea urchins; population dynamics of Diadema antillarum; effects of sea urchins on coral recruitment.

LEVERONE, JAY R. - reproductive cycles of Astropecten and Luidia in lower Tampa Bay.

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

LEVITAN, DONALD R. - ecological and evolutionary consequences of sperm limitation in echinoderms; echinoid grazing pressure in the Caribbean.


LITVINOV, NINA M. - Revision of the genus Ophiomyces (Ophiacanthidae); new species and genus Ophiuraster (Ophiuridae); ophiuroids of New Caledonia.

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

LOVELY, ERIC C. - coexistence of hydroid predators in Tubularia larynx colonies.

MACURDA, JR., D. BRADFORD - modern crinoids and blastoids.

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

MAGSINO, RICHARD M. - population genetics of the blue-coral reef starfish Linckia laevigata. The techniques used in the analysis of its population structure in relation to gene flow levels among populations in the South China Sea are the protein allozyme electrophoresis and RFLP (restriction fragment length polymorphism) analysis of PCR-amplified products of its mtDNA.

MAH, CHRISTOPHER L. - I am currently finishing up a phylogeny and systematic revision of the Brisingida. I am concurrently describing a new genus and species of brisingid from Tasmanian seamounts. I am interested in eventually working a a phylogeny and systematic revision of the forcipulate clade, especially the zoroasterids. I have broad interests in asteroid phylogeny of deep-sea and Indo-Pacific taxa, especially Hawaii.

MAHARAVO, JEAN - study about proliferation of Salmaciella erythracs in Ambaro Bay (Nosy-Be) Northwest coast of Madagascar.

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

MAKRA, ATHENA - arm regeneration in Acrocnida brachiata (Ophiuroidea); microdistribution of A. brachiata in Little Killary, west coast of Ireland bioturbation.
MALLEFET, JEROME C. - luminescent ophiuroids; morphological, physiological, ecological aspects.

MANNI, RICCARDO - systematics, morpho-functionality, ontogenesis and evolution of Jurassic non-isocrinid crinoids.

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

MARAN, ALEKSANDRA A. - 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. - guide to the shallow-water echinoderms of Australia.

MARTINEZ, PRISCILLA C. - population and reproductive biology of the sea cucumber Isostichopus fuscus in the Galapagos Islands.

MASCARENHAS, BERNARDO JOSE DE A. - pattern of distribution of asteroidea from Guanabara Bay, Rio de Janeiro, Brazil.

MASSIN, CLAUDE - holothurian taxonomy; Easter Island, Indonesia, Papua New Guinea.

MATERIA-ROWLAND, CHRISTINE J. - 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.

McBRIDE, SUSAN C. - 1. Density/ration study with small (25 mm) Strongylocentrotus franciscanus using the extruded diet most recently developed by J.M. and A.D. Lawrence. Planned duration - 6 months. 2. Growth study of small (15 mm) S. franciscanus using Nereocystis luetkeana and the extruded diet - planned duration 1-2 years. 3. Growth study with medium (40 mm) S. franciscanus using the extruded diet - planned duration - 1 year. 4. Growth study of Parastichopus californicus using 30, 40 and 50% protein meals developed by Lawrence and Lawrence and the extruded diet.

McCLINTOCK, JAMES B. - chemical ecology of echinoderms from the Gulf of Mexico and Antarctica.
McEDWARD, LARRY R. - simulation models of larval planktotrophy in marine invertebrates; effects of endosulfan on larval development of sea urchins.

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

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

McNAMARA, KENNETH J. - 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 E. - 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, OKTAI HAMZA - investigation, evolutionary, systematic and development of orders Spatangoid, Holasteroid and Holectypoid of Azerbaijan (late Cretaceous and Eocene).

MESSING, CHARLES G. - systematics and biogeography of comatulids; growth, morphology, distribution and taphonomy of Isocrinidae.

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

MILLER, ROBERT J. - evolution and biogeography of the Elasipoda (Holothuroidea).

MIRONOV, ALEXANDER - Taxonomy and biogeographic history of recent holasteroid echinoids.

MITROVIC-PETROV, JOVANKA R. - study of some Cretaceous and Neogene echinoids of Serbia and Monte Negro (taxonomy, paleoecology, functional morphology, taphonomy); study of some Cretaceous and Neogene echinoids of Greece (together with A. Marcopoulou-Diacantoni - Athens).

MLADENOV, PHILIP V. - 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 C. - red sea urchin (*Strongylocentrotus franciscanus*) management by the Hesquiat First Nation: implications for community structure and the successful establishment of a
commercial sea urchin fishery.

MOORE, ABIGAIL M. - 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, KATHERINE - lecithotrophy in starfish; the evolution of developmental patterns and life cycle evolution.

MORRILL, JOHN B. - cytoembryology of Echinometra lucunter.

MOTOKAWA, TATSUO - biology of stalked crinoids; catch connective tissue.

MOUCHATY, SUZETTE - molecular systematics of the Mellitidae.

MUKAI, HIROSHI - ecosystem study in tropical and boreal seagrass beds; bioturbation and restructurial effects on material flow at interface of sea floor.

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.

NAKAMURA, RAYMOND K. - involved with AQUAVAN, an educational outreach program for the Vancouver Aquarium. I travel around the province of British Columbia bringing seashore life, including sea stars, sea urchins and sea cucumbers into schools to teach children about aquatic conservation.

NAKANO, EIZO - The role of extracellular matrix in development.

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

NEILL, BRUCE J. - biogeography, systematics and population biology of echinometrids.

NEPOTE, ANA CLAUDIA - holothurians of Marietas islands, Nayarit, Banderas Bay, Mexico; systematics of holothurians of Banderas Bay, Mexico (central Pacific).

NESTLER, HELMUT - Maastrichtian echinoids from the chalk of Rugen (North Germany); Cretaceous echinoids from South Yemen.

NEUMANN, CHRISTIAN - phylogeny and paleoecology of Toxasterid echinoids; echinoids and gastropod predation; Cretaceous echinoids from the Betic Cordillera (Spain); functional morphology of Cretaceous 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 palaeocology of Jurassic crinoids; evolution and stratigraphy of
NISHIHIRA, MORITAKA - effect of heart urchins on coral community structure of the sandy bottom.

NOJIMA, SATOSHI - feeding effects of *Acanthaster planci* on recruits of corals.

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

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


OLI, 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.

PABIAN, ROGER K. - Late Pennsylvanian-Early Permian crinoids, associated faunas, epibionts, paleoecology, and biostratigraphy.

PAGETT, RICHARD M. - Caspian Sea: literature review.

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

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

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

PEARCE, CHRISTOPHER M. - marine invertebrate settlement, metamorphosis, recruitment.

PENCHASZADEH, PABLO E. - Ecology of sand dollars (*Mellita* spps); trophic ecology of asteroids.

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

PEREZ-RUZAF A, 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.

Barrandian area. This book will be written in English and published at the end of 1998.

PHILIPPE, MICHEL - Miocene echinoids.

PIEPENBURG, DIETER - ecology of brittle stars in Arctic and Antarctic seas.

PODOLSKY, ROBERT D. - biochemistry of temperature adaptation in gametes of Strongylocentrotus spp.; evolution of egg accessory structures in free-spawning invertebrates.

PORTELL, ROGER W. - echinoid biostratigraphy of Florida (especially undescribed Miocene taxa); occurrence of phosphatic echinoids, brachiopods, and annelids from the Upper West Florida slope, eastern Gulf of Mexico.

PRESTEDGE, GEOFFREY K. - study of Pittwater, S.E. Tasmania, re: the regrowth of Zostera sp., also Codium sp. beds now that nutrient levels in the water have decreased with upgrading of local sewerage treatment plants, and to see if several species of echinoderms return if the above species of algae recover sufficiently.

PUTCHAKARN, SUMAITT - taxonomic study of echinoderms from the eastern coast, the Gulf of Thailand.

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

RAM MOHAN, M. K. - reproductive biology (including reproductive cycles), induced maturation and cross fertilization of echinoderms, especially holothurians.

REGIS, MARIE-BERTHE - population dynamics of regular echinoids in the Mediterranean; enzymatic study of the nutrition of Paracentrotus lividus (Echinodermata: Echinoidea).

REICH, MIKE - fossil holothurians, especially holothurian sclerites of the European boreal Upper Cretaceous; holothurian remains of Oligocene clays (Rupelian) of northern Germany; Jurassic and Cretaceous calcareous ring elements with comparisons to recent holothurians.

REY, DANIEL - Cretaceous and Tertiary echinoids of Spain.

ROBINSON, SHAWN M.C. - green sea urchin fishery ecology; roe enhancement of the green sea urchin; development of artificial diets for sea urchins.

ROCCATAGLIATA, ALEJANDRO J. - chemistry of physiologically active compounds isolated from starfishes and brittle stars in the South Atlantic Ocean.

RODRIGUEZ, SEBASTIAN R. - 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 holcetypoid echinoid Echinoneus.

ROTMAN CLARK, HELEN E.S. - systematics of Southern Ocean asteroi ds and ophiuroids.

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 S. - molecular evolution of ophiuroids: phylogeny, phylogeography, population genetics in Amphipholis squamata, Ophiactis savignyi, Ophiocoma scolopendrina. (http://www.dnapop.zi.ku.dk)

SABA, MASAKI - taxonomic studies of Japanese sea-stars.

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 - foraging behavior, recruitment, and growth of Pisaster ochraceus.

SANO, MINORU - population ecology of Strongylocentrotus nudus.

SASTRY, DWADASI R.K. - echinoderms of coral reefs.

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

SCHELTEMA, RUDOLF S. - larval dispersal - most recently in the Antarctic.

SCHOPPE, SABINE - The Echinoderms of Leyte, Philippines - a practical field guide.

SCHUETZ, ALLEN W. - development of a new model for multiparameter analyses of perturbations of gametic and embryonic processes.

SEETO, JOHNSON - taxonomy of Fiji echinoderms.

SERAFY, D. KEITH - zoogeography of Atlantic echinoids.

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

SHEPHERD, SCORESBY A. - food web studies; comparison between abalone and sea urchins.

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

SHIRLEY, THOMAS C. - 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 chiajel*). Ecotoxicology and fate of contaminants in marine environments, especially infaunal brittle stars.

SLOAN, NORMAN A. - sea cucumber fisheries.

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

SMIRNOV, ALEXEI V. - deep-water holothurians from New Caledonia; Arctic and North Pacific echinoderms fauna; taxonomy of apodid 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 B. - morphological and molecular phylogenies of echinoderms; Maastrichtian and Palaeocene echinoids.

SOLIS-MARIN, FRANCISCO A. - evolution of echinoids; taxonomy of the phylum.

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

SONNENHOLZNER, JORGE I. - 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 T. - symbiotic relationship between *Holothuria atra* and the polka-dot crab in the Hawaiian sublittoral zone.

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

STANCYK, STEPHEN E. - 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.

STEWART, BRIAN G. - reproductive biology of *Astrobrachion constrictum* and *Ophiopsammus maculata* (Echinodermata: Ophiuroidea); growth rate and reproduction in *Stichopus mollis* (Echinodermata: Holothuroidea).

STICKLE JR., WILLIAM B. - investigating seasonal and latitudinal adaptations of *Leptasterias* spp. populations to temperature from the physiological perspective.
STORC, RICHARD - ophiuroids and asteroids from the Upper Cretaceous (Cenomanian-Turonian) of the Bohemian Cretaceous Basin (Czech Republic).

STRATHMANN, RICHARD R. - developmental plasticity of larvae; limits on the aggregation of embryos; evolution of rates of development of embryos.

STUMP, RICHARD J. - population dynamics of *Acanthaster planci* (L.).

SUMIDA, PAULO Y.G. - ecology and ontogeny of the post-larval development in deep-sea ophiuroids.

TABLADO, ALEJANDRO - systematics of Asteroidea from southwestern Atlantic and Antarctic Peninsula.

TAHERA, QASEEM - an illustrated key to the echinoderms of Pakistan.

TAKAHASHI, KEIICHI - physiology of the madreporite; physiology of echinoid spine muscle and catch apparatus; motile mechanism of echinoderm sperm flagella.

TALBOT, TIFFANY D. - salinity tolerances and other factors of *Ophiophthalmus filograneus*.

TAVARES, YARA A. G. - ecology, histology, morphology studies of *Mellita quinquiesperforata* in beaches of Parana's State, relation between morphodynamics and spatial distribution.

TELFORD, MALCOLM - collagen in tooth support mechanism of clypeasteroids; podial forces in *Asterias*; computer simulation of *Dendraster* distribution.

THANDAR, AHMED S. - Monograph of the southern African holothuroid fauna. Study of the deep sea holothuroids collected off the southern African east and west coasts.

THIERRY, JACQUES - Jurassic (Mesozoic) echinoids - France and some western Europe countries; morphology and relation with palaeoenvironment changes (overall sea-level variation).

THORNDYKE, MICHAEL C. - molecular and cellular aspects of neuronal development; environmental influences on development; neuronal regeneration; neuropeptides, biochemistry and physiology.

THORSEN, MARIANNE S. - the ecophysiology of the irregular sea urchin *Echinocardium cordatum* - interactions with gut microbiota.

TIEFENTHALER, LIESL - research on the red brittlestar *Amphiodia urtica*.

TOMINAGA, HIDEYUKI - biology of the sand dollar and heart urchin, especially key-hole urchins: *Echinodiscus tenissimus* and *Astriclypeus manni* in Japan, and brooding spatangoids like *Abatus*, encompassing population study, growth, development, age determination.

TRONCOSO, JUAN F. - 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.
TUTERA, PETER - monograph of the irregular echinoids of Prydz Bay, Antarctica; new Pachycentrotus species.

UBAGHS, GEORGES J.C. - new echinoderms from the Upper Cambrian of the Montagne Noire (southern France).

v.JUTERZENKA, KAREN - ecology of Arctic ophiuroids and their function within the benthic food web (within the framework of AOSGE).


VADET, ALAIN - Triassic echinoids of St. Cassian; evolution of Triassic and Jurassic echinoids.

VALENTINE, JOHN - continuing investigations of sea urchin herbivory and predation on sea urchins in the Florida Keys.

VAN DER HAM, RAYMOND W.J.M. - 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.

VEGA, JUAN TORRES - study of the echinoids and ophiuroids collected on the Campanas Oceanograficas Proibe I-II-III-IV-V.

VELARDE, RONALD G. - benthic infauna and trawl invertebrates of the Southern California Bight, taxonomy and distributional ecology (in conjunction with other monitoring agencies in southern California).

VIKTOROVSKAYA, GALINA I. - reproduction of invertebrates in artificial and natural conditions.

VILLIER, LOIC - Cretaceous and Jurassic asteroids of the Aquitaine Basin (France) dealing with taxonomy (based on isolated ossicles in a Tethyan region, weakly known), skeletal ontogeny, evolutionary trends (ontogenetic and ecological constraints, biogeographic exchanges) and relations between biodiversity and paleoenvironmental changes.

VISTISEN, BODIL K. - studying the two brittle stars Ophiura albida and Amphiura filiformis concerning their tolerance towards hypoxi with and without the presence of hydrogenesulphide.

WAREN, ANDERS H. - gastropods parasitic on echinoderms.

WASSON, KRISTINA - reproduction and factors that control reproduction in echinoids.

WATTS, STEPHEN A. - steroid metabolism in echinoids.
WEBSTER, GARY D. - Carboniferous and Permian crinoids of Australia - with Peter Jell; Early Carboniferous crinoid faunas of the western U.S.

WELCH, ULRICH - innervation of the juxtaligamental cells in crinoids; analysis of the connective tissue of crinoids.

WHITE, CHRIS - crinoids.


WILKIE, IAIN C. - 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.

WILCOX, MARK S. - molecular phylogeny of asteroids; genetic basis to salinity adaptation in asteroids.

WILLIAMSON, JANE E. - 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).

WORHEIDE, GERT - actuopaleontology and ecology of Astrosclera willeyana Lister 1900 (Demospongiae) (for Ph.D. thesis); taphonomy of coral reef echinoids.

WRAY, GREGORY A. - evolution of body-patternig genes in echinoderms; evolution of echinoderm larvae; phylogeny of echinoids.

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.

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.

ZAVODNIK, DUSAN V. - biodiversity of the Adriatic Sea invertebrates - Echinoderm distributional patterns.

ZITT, JIRI - Lower Cretaceous crinoids of West Carpathians; crinoids and echinoids of the Bohemian Cretaceous Basin (late Cenomanian- early Turonian).
THESES AND DISSERTATIONS

AUSTRALIA

Ph.D. Dissertation


BELGIUM

Masters Thesis


CZECH REPUBLIC

Ph.D. Dissertation


ECUADOR

Ph.D. Dissertation

FRANCE

Thèse Doctorat Ecologie


GERMANY

Ph. D. Dissertation


Masters Thesis


INDIA

Masters Thesis


JAPAN

Ph.D. Dissertation

Master of Science


NEW ZEALAND

PhD Dissertation


Masters Thesis


NORWAY

Masters Thesis

Halldis Ringvold. 1996. Artsbestemmelse og utbredelse av sjoestjerner (Echinodermata: Asteroidea) rundt Faeroeyene (Identification and distribution of starfishes (Echinodermata: Asteroidea) around the Faroe Islands). Norwegian University of Science and Technology (NTNU), Trondheim Biological Station, Norway.


PAKISTAN

Ph.D. Dissertation

PORTUGAL

Degree - Marine Biology and Fisheries


UNITED KINGDOM

Masters Thesis

Moore, Abigail Mary - (submitted 1998) - A study of the holothurian resources and some other invertebrate fisheries combined with work aiming to interpret a 1993 Landsat TM satellite image for the new Wakatobi National Marine Park in SE Sulawesi, Indonesia. The University of Hull, UK. (The MSc course title is Global Biodiversity, Monitoring and Conservation at The University of Hull, UK).

UNITED STATES

Masters Thesis


Robert Miller. (in progress). Rapid ingestion of sinking organic matter by bathyal surface deposit-feeders, as indicated by Th-234. University of Massachusetts, Boston.

Ph. D. Dissertation


INFORMATION REQUESTS

Bauer, John - please inform me of any echinoid diseases or mortalities. I can be contacted at the following address: 7794 Cloverfield Circle, Boca Raton, Florida 33433, USA.

Dora Jesus - would appreciate literature on the genus Schizaster (Echinoidea) living, Mediterranean Sea and Atlantic Ocean, especially taxonomic.

K. Emily Knott - I am hoping to collect sea stars in the Cape Verde Islands and possibly the Canary Islands at some time during the next year. If you have had some experiences collecting in these areas, please send me email at kelkott@life.bio.sunysb.edu I would love to talk to you.
Also, I am still collecting any EtOH preserved or frozen sea star tissue for molecular work to help my efforts in producing a comprehensive asteroid phylogeny. I you wish to make a donation to my cause, contact me at kelkott@life.bio.sunysb.edu. Thanks!

Richard Magsino - I am working on the population genetics starfish, Linckia laevigata. I would like to contact researchers working on the population genetics of starfishes or any other echinoderms using protein allozyme electrophoresis and other DNA-level genetic markers (e.g. mtDNA RFLPs). My samples came from the South China Sea region in the Southeast Asia. Please contact rickym@msi01.cs.upd.edu.ph

Chris Mah - I am always interested in obtaining asteroid material from deep-sea Central Pacific and Indian Oceans. Especially brisingidans, forcipulates and goniasterids. Please contact cmah@cas.calacademy.org

Abigail Moore - I would like to have contact with anyone with experience in - attempting regulation (by consensus, enforcement or a mixture) of holothurian exploitation, especially "on the ground", working with fishing communities, not just designing regulations.

- artisanal pen-culture of juveniles, especially working with communities with low economic and educational status.
- improving returns to fishing communities (post-harvest mainly)
- education programmes for coastal communities
- collection of local enviromental knowledge

I would also like to contact anyone with similar types of experience or interest based on any tropical coastal species, not just holothurians. I am very keen to pursue options for reconciling the conservation of biodiversity with the needs of coastal human populations. My immediate concerns are based in Sulawesi, Indonesia, but many of the challenges are common throughout the Indo-Pacific and often beyond. Parks etc can only be an option for a minority of the vast areas involved, if only because of the costs of both setting up and running them. I feel that low-cost low-tech largely local resource based approaches need to be found, which could affordably and realistically be applied more widely than Marine Parks. Hence the pilot project I am involved in - which is still at a preparatory stage. Please contact abigailmoore@hotmail.com
M.K. Ram Mohan - seeks references on reproductive biology, induced maturation and cross fertilization of echinoderms, also triploid or polyploid studies.

Payikat Sahadevan Asha (Tuticorin, India) requests reprints on the induced maturation, spawning and asexual reproduction in holothurians.

Tahera, Q. - would appreciate any publication on echinoderms related to taxonomy, systematics, reproduction, larval distribution and biodiversity.

☆ ANNOUNCEMENTS ☆

Giudice, G. - organized an “ICRO” theoretical-practical course on “sea urchin eggs and embryos as model cells” which was held in Oristand, Sardinia, Italy (International Marine Centre) from September 17 - October 1, 1997, to which 18 people from 14 countries participated. I also organized (same location) a satellite symposium on “cell division and sea urchin development”.

Grygier, M.J. - has prepared a checklist of all nominal extant species of Myzostomida (not fossil Myzostomites) including original name, any subsequent spellings and generic reassignments and supposed synonymies, and notes concerning outstanding nomenclatural issues. It is up-to-date as of mid-July, 1997. Copies of this “List of Nominal Species of Myzostomida” are available upon request from Mark J. Grygier (grygier@lbm.go.jp).

Václav Petr - Zoological Library, Charles University, Praha.
My personal bibliography is now accessible at the location http://lib.natur.cuni.cz/BIBLIO/PETR.HTM and also includes some free available articles (especially the article on the first occurrence of a brittlestar bed in Bohemia and my large article on the extinctions in the fossil record). This bibliography will be continually updated.

From Dora Maria Cunha de Jesus -

From Elizabeth Balser -

Readers are encouraged to attend the Society of Integrative and Comparative Biology Annual Meeting, Jan 6-10, 1999, in Denver. Of particular interest to echinoderm biologists is a symposium titled “Evolution of Starfishes: Morphology, Molecules, Development, and Paleobiology”.

☆ ECHINODERM WEB PAGES ☆

Francesco Bonasoro - http://imiucca.csi.unimi.it/rchino/5ece7.htm

Thomas Brey - http://www.awi-bremerhaven.de

Jon Eggert - (contact: midvangur@islandia.is) Reference Page http://www.islandia.is/midvangur/new_page_8.htm

Reimund Haude - http://www.gwdg.de/uggpwww/

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


Christopher Mah - CAS Echinoderm Web Page www.calacademy.org/research/izg/echinoderm/

Charles G. Messing - comatulid crinoid web pages http://www.nova.edu/ocean/messing/crinoids/w1title.html

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

Mike Reich - http://www.uni-greifswald.de

Mattias Skold - http://www.otago.ac.nz/MarineScience
RECENT ECHINODERM PUBLICATIONS AND PAPERS IN PRESS

Visit the California Academy of Sciences web page

http://www.calacademy.org/research/izg/echinoderm/conference/


Agatsuma, Y., S. Nakao, S. Motoya, K. Tajima, and T. Miyamoto. Relationship between year-to-year fluctuations in recruitment of juvenile sea urchins Strongylocentrotus nudus and seawater temperature off
the Sea of Japan coast in southwestern Hokkaido. Fisheries Science. (in press).


Candida Carnevali M.D., F. Bonasoro, and A. Biale. 1997. Pattern of bromodeoxyuridine incorporation in the


Göttingen.


(To be presented at the 5th European Conference on Echinoderms, Milano, Sept. 1998: Habitat and lifestyle of crinoids from some fossil assemblages.)


Hollertz, K., M. Sköld, and R. Rosenberg. (in press). Interactions between two deposit feeding echinoderms; the heart-urchin Brissopsis lyrifera (Forbes) and the brittle-star Amphiura chiajei (Forbes). Hydrobiologia.


Isaeva, V.V., and V.L. Kasyanov. Evaluation of fibrillar actin in the oocytes of sea star species with different reproductive strategies. (in press).


Levin V.S. Feeding by shallow water holothuroids (Echinodermata) and its effect on the environment. (in press).


Mladenov, P.V. Class Ophiuroidea In: New Zealand Coastal Invertebrates. Steve C. de Cook ed. (in press)


Wissenschaften.


Reich, M. 1996. Holothurienreste (Echinodermata) aus der Weißen Schreibkreide (Unter-Maastrichtium) der Insel Rügen (Norddeutschland). [Holothurian remains (Echinodermata) from the White Chalk of the Isle of Rügen (Northern Germany)]. - Terra Nostra (Schriften der Alfred-Wegener Stiftung), 96/6: 72; Bonn.


Webster, G.D., and K.J. Houck. 1999. Middle Pennsylvanian, Late Atokan-Early Desmoinesian, echinoderms from an intermountain basin, the Central Colorado Trough. Journal of Paleontology.


John Lucas, James Cook University, Australia

I began to study echinoderms due to a villain.

My story goes back to the late 60s and early 70s when I was a new lecturer at James Cook University in northern Queensland. My PhD at University of Western Australia had been on various aspects of the biology of an insignificant group of spider crabs. It involved experimental studies on their ecophysiology. Thus, when I was appointed to JCU in 1968, I went there with plans to research crustaceans of the Great Barrier Reef. My plans were soon dashed. It was only possible to get out to the reefs nearest to Townsville by a 3 hour boat trip and these boat trips were organised by a shell-collectors’ club. The trips only went out in winter months on days of spring low tides (to enable the shell-collectors to walk on the reef at low tide) and they only went out in calm weather. I waited through months of cancelled trips, due to bad weather, before I got out to the Great Barrier Reef. The coral reef community that I saw was overwhelming in beauty and complexity. It did not seem possible to take any component and research it in a sensible fashion. Thus, I gave up the idea of working on crustaceans of the GBR and looked to working on the intertidal crabs of the local mangroves (more than 40 crab species).

Then along came Acanthaster planci, the Crown-of-thorns starfish, “eating its way southwards” along the GBR in the late 60s. The late Dr Robert Endean, who was always prepared to give a strong opinion, stirred up public concern through the media. There was sufficient public concern about this villainous starfishes’ threat to the GBR that Queensland government funds were made available for research into its ecology and coral damage. By chance, I became involved in a minor way with the Queensland government group that was researching the starfish. Although the larvae of Acanthaster were totally different to those of the crustaceans that I had previously worked with, I offered to have a go at rearing these larvae and was successful. There they were: tiny 5-armed starfish that subsequently grew and added arms.

Federal government funding was allocated for research on Acanthaster and I had a head start in the competition for funding with my experience of researching the early lifecycle. I then started from the hypothesis that the high fecundity of this starfish is the source of “plagues” in combination with environmental factors that strongly influence the survival of the initial tens of millions of eggs and larvae. Hence I engaged in a series of laboratory studies on the lifecycle of Acanthaster and environmental factors influencing the various stages. The problem of
access to the GBR was solved through obtaining enough funding to hire a small fast boat to go out to the reef according to my needs for starfish. The problem of identifying a manageable research topic was solved by the villain.

Ultimately, I teamed up with the eminent echinodermologist, Dr. Chuck Birkeland of University of Guam, to produce a book, "Acanthaster planci: Major Management Problem of Coral Reefs", CRC Press. We complemented each other’s interests, in that Chuck’s interests were primarily in field studies while mine were primarily in laboratory studies. Unfortunately, the book did not become an international best seller (probably its price ensured that it was strictly in the category of a library purchase).

The Crown-of-thorns starfish is still a “villain” in the destruction that it causes to many coral reefs in the Indo-Pacific region. We now know a lot about its biology and ecology, but there are still fundamental questions about the “plagues” that remain unanswered. These big questions are now in hands of the newer generation of coral reef ecologists and echinodermologists.

Ram Mohan M.K. (MRC of CMFRI, Tamilnadu, India).

After completing the course work of my Ph.D. program, I was fortunate to be put under Dr. D.B. James, the eminent Echinoderm specialist, to work on Echinoderms. At that time I had very limited knowledge of echinoderms, particularly confined to starfishes. Later we were asked to give two credit seminars as a part of our program, for which I selected the topics on holothurian resources and reproductive biology of some holothurians seen in India. While preparing for these seminars I had a fair amount of reading on not only holothuroids but also echinoderms in general. Slowly but steadily I developed an interest in the group. At CMFRI, Cochin and also during my brief stay at Tuticorin, I came across a good deal of literature, which gave me more insight into the characteristics of echinoderms, particularly taxonomy, diversity and reproductive features. At present I am doing my research on reproductive biology of holothurians. There is only one word which comes to mind when I think of echinoderms - ‘Namasthe’ (the Indian equivalent for Salute).

During my post-graduation, I was not having much idea on sea cucumbers. After that I got through the Agriculture Research Service as a scientist in C.M.F.R.I. I was in Fisheries Environmental Management Division and was very much eager to know about the projects allotted to me. After one month I got the transfer along with the projects allotted. I was surprised to know that I have to work under an eminent Senior Scientist Dr. D.B. James. I was very much enthusiastic to collect much information about sea cucumbers. After my preliminary discussion with Dr. James, I came to know that my knowledge is very poor, and I have to work a lot. When I started working, I could understand that the echinoderm - sea cucumber is an interesting animal group both economically and experimentally and it is the responsibility of all to conserve them as a scavenger of marine environment.

Robert Singletary (University of Bridgeport, Connecticut)

In the late 60's I was a new graduate student in Hilary Moore's laboratory. At that time the research focus was on the autoecology of the animals that made up the benthic community of Biscayne Bay. While many of the animals in the community had been studied, no one had tackled the most abundant animals, the brittle stars. Therefore, I naively decided that would be a fruitful research area. I soon found out why these animals were avoided, the brittle part of their name was their most impressive characteristic. It seemed that all you had to do was look at these animals and they would break apart. Additionally, we were in Miami, Florida, within easy reach of coral reefs, and the animals I chose to study lived in the muddy bottoms of turbid Biscayne Bay. Still the research was rewarding, and I was able to visit the reefs to obtain comparative information. I also learned what fascinating animals echinoderms are and I continue to marvel at them.
☆ CONFERENCES AND MEETINGS ☆
(By Country or Region)

AFRICA


AUSTRALIA


CANADA


**EUROPE**


**INDIA**

James, D.B. New resources for the Indian Beche-de-mer industry and their management. *Fourth Indian Fisheries Forum. Organised by School of Marine Sciences, Cochin University of Science and Technology, Kochi. 25 November 1996.*

James, D.B. Sea cucumber hatchery and culture prospects. National Aquaculture Week Workshop at Tuticorin. Organised by the Aquaculture Foundation of India, Madras, 7/2/97.

James, D.B. On biotoxicity in echinoderms. National Symposium on Recent Developments in Natural Products. Organised by the Department of Chemistry, Andhra University, 12/7/97.

James, D.B. Sea cucumber culture and seed production at the Indo-Egyptian Workshop on Oceanography with exclusive focus on mariculture. Organised by the Central Marine Fisheries Research Institute, Kochi, 9/12/97.

JAMAICA


JAPAN


PAKISTAN


RUSSIA


UNITED STATES


Andacht, T.M. Metal binding proteins are involved in fertilization envelope elevation in the sea urchin, _Lytechinus variegatus_ (Lamarck). *Developmental Biology of the Sea Urchin XI, Marine Biological Laboratories, Woods Hole, MA, 10-14 September 1997._

Arakaki, Y. A comparative ecological and reproductive study on the four types of sea urchin _Echinometra mathaei_ (Blainville) on Okinawa reef flat. *9th International Echinoderm Conference San Francisco, California, USA, 5-9 August 1996._


De Ridder, C., and R.L. Brigmon. A symbiotic relationship between spatangoids (Echinoidea) and _Thiothrix_ spp. 96th General Meeting of the American Society for Microbiology, New Orleans, Louisiana (USA). May 1996.


Lane, N.G. 1. Age and Revision of Whidborne's (1898) Echinoderms from the Lower Pilton beds (Famennian) of the type Devonian. 2. A time-line for the pre-1700 literature on fossil and living crinoids. *Abstracts, Geological Society of America meeting, Salt Lake City, October 1997._

Miller, R.J. Rapid ingestion of sinking organic matter by bathyal surface deposit-feeders, as indicated by Th-234. *Deep-Sea Biology Meeting, Monterey, California, October 1997.*


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**Papers on Echinoderms presented at the XIV Zoology National Congress, November 4th -7th 1997, Guanajuato, Guanajuato, México.**

(Communicated by Francisco Solis-Marin).


Benítez Villalobos, F., and A. Estrada Vargas. Los equinodermos de la zona intermareal de Santa Elena, Oaxaca.


Mata Pérez, E. & Laguarda-Figueras, A. Principales factores bio-abióticos que afectan la distribución de la Familia Luidiidae (Echinodermata:Asteroidae), en las costas de México.
The Fourth Annual Florida Echinoderm Festival was held at Jacksonville University on 25 October 1997, organized by Dr. Lee Ann Clements.

The next Festival will be at the University of South Florida in autumn, 1998.


(Communicated by Christopher Mah).

Ahlgren, M.O. Sheldon Jackson College, Sitka, AK. Seasonal changes in body composition and diet of red sea cucumbers (*Parastichopus californicus*) near Sitka, Alaska.


Dalby, J.E., Jr., W.G. Ambrose, Jr., and P.E. Renaud. Biology Dept. Bates College, Lewiston, Maine. Do ice cover and food supply affect growth of arctic ophiuroids?


James, D.W. Moss Landing Marine Labs. The biology of the sea urchin *Toxopeustes roseus* in rhodolith beds in Baja California Sur, Mexico.

Konar, B. UC, Santa Cruz. Kelp stand persistence adjacent to urchin Barrens.

Lambert, P. Royal BC Museum Victoria, B.C. Canada. Recent additions to the holothuroid fauna of the northeastern Pacific Ocean (Echinodermata).

McAlary, F. and T. Turney. Friday Harbor Labs, WA; Catalina Isl. Conservancy. Kelp, urchins, and ocean climate at Catalina Island.

McNaught, T. D.C. Univ. of Maine, Darling Marine Center. Are populations regulated by supply or post-settlement mortality? Algal habitat effects on settlement and survival of the green sea urchin.


Vicknair, K.E., J.S. Pearse, J.A. Estes, J.B. McClintock. UC Santa Cruz and University of Alabama, Birmingham. When keystones collide: sea otters and sea stars.

Annual Meeting of the Florida Association of Benthologists St. Petersburg, Florida. 2-3 December 1998.
(contributed by J.M. Lawrence)

Tan, Chih-Yi. Variability in size-frequency distributions of populations of the sand dollar Mellita tenuis over space and time.

Hill, Sophie, and John Lawrence. Microhabitats of co-occurring sea urchins Lytechinus variegatus and Arbacia punctulata on the Florida gulf coast shelf.

Lawrence, John, Reinaldo Rios, and Paul Llobet. The sand dollar Mellita tenuis and the starfish Luidia senegalensis at Naples, Florida.

(contributed by J.M. Lawrence)

Agatsuma, Yukio. Urchin aquaculture in Japan.
Burke, Brian G. Sea urchin gonad enhancement: economic feasibility analysis.
Cook, Elizabeth, and Maeve Kelly. Gonad development and somatic growth in the green sea urchin Psammechinus miliaris fed artificial and natural diets.
Garrido, Carolina L., and Bruce J. Barber. Effects of temperature and food ration on gonad growth and gametogenesis of the green sea urchin *Strongylocentrotus droebachiensis*.

Grosjean, Philippe, Christine Spirlet, and Michel Jangoux. Is land-based closed cycle echiniculture (sea urchin aquaculture) a viable alternative to fisheries today?

Kelly, Maeve S. Factors influencing the asomatic and somatic growth of the sea urchin *Psammechinus miliaris* when maintained in polyculture with the Atlantic salmon.

Keesing, John, Karina C. Hall, and Steven M. Clarke. Review of status of world sea urchin fisheries points to opportunities for aquaculture.

Lawrence, Addison, John Lawrence, Joseph Kearnes, and Galen Rokey. The development of prepared feeds for sea-urchin aquaculture.

Lawrence, John, and Alexander Bazhin. The use of life-history characters to evaluate the potential of sea urchins for aquaculture.

Lesser, Michael P., and Charles W. Walker. Over exploitation of the urchin fishery: does history repeat itself and is there anything we can do to insure a sustainable yield to the market.

McBride, Susan C., John Lawrence, and Addison Lawrence. Growth, feeding rate, and feeding efficiency of small sea urchin *Strongylocentrotus franciscanus* fed prepared feeds of three protein levels.


Watts, Stephen A., S. Anne Boettger, James B. McClintock, and John Lawrence. Assessment of *Lytechinus variegatus* as a fishery and aquaculture candidate in the Gulf of Mexico.


(Contributed by J. M. Lawence)


Flammang, P. What can footprints tell us about temporary adhesion of seastar podia. p.179A.


Hoffman, J.R. The good, the bad, and the ugly: UV-induced developmental difficulties in the sand dollar *Dendraster excentricus*. p.192A.

Janies, D. Xyloplax is an asteroid. p.195A.

Lee, S.E. A molecular comparison between species within the diadematid urchin genus Centrostephanus (Echinoidea). p.58A.


Levitan, D.R. The battle of the bulge: selection on egg size in marine invertebrates. p.111A.


McEdward, L.R. Simulation models of larval planktotrophy in marine invertebrates. p.111A.

McGovern, T.M. General and reproductive ecology of the brittle star Ophiactis savignyi. p.46A.

Mooi, R., and B. David. Evolution within a bizarre phylum: advances in understanding skeletal homologies of the earliest echinoderms. p.88A.


Vickery, M.S., and J.B. McClintock. Regeneration in sea star larvae. p.191A.


Papen presented at the XVIII Congreso de Ciencias del Mar, Iquique, Chile, 4-8 May 1998.

(Communicated by J.M. Lawrence)


Lawrence, J.M. Energy budgets, life-history strategies and the potential of sea urchins for aquaculture.

Soto, R. Estado actual del conocimiento de los equinodermos en la zona norte de Chile y su relación en eventos “El Niño”.


Stotz, W., C. Valladares, E. Pérez, and S. Marín. Estimaciones de mortalidad para el erizo rojo Loxechinus albus en la XII Región.

Vásquez, J., and J. Vega. Ecología de asteroides submareales del norte de Chile.

Volbehr, U. Ecología y nutrición de *Anasterias antarctica* (Luetken, 1856) (Echinodermata: Asteroidea) y *Pseudoechinus magellanicus* (Echinodermata: Echinoidea) en una playa de bloques y cantos: Bahía Laredo, Región de Magallanes.


(Communicated by Thomas Scott Klinger)


Bosch, I., and D.K. Karentz. Effects of UV light on echinoderm development during the Antarctic springtime depletion of ozone. A12

Christensen, A.B. The effects of declining PO2 and hypercapnia on the oxygen consumption rate of *Hemipholis elongata* (Echinodermata: Ophiuroidea). A15

Creaser, E.S. Variation in tubefoot structure along the length of a burrowing brittlestar *Acrocnida brachiata*. A17

Creaser, E.S., L.L. Robbins, and J.M. Lawrence. An investigation into the relationship between magnesium, echinoderm skeletal proteins and calcium carbonate. A21

Dale, J. Chemosensory search behavior in the starfish *Asterias forbesi*. A18

Ferguson, J.C. How do echinoderms maintain fluid balance? A14

Greer, S.P., C.D. Amsler, and J.B. McClintock. Inhibition of algal spore settlement caused by aqueous and organic extracts of seastar body walls. A13

Hill, R.B. What is “local degeneration” in holothurian body wall? A18


Hottenrott, S.I. Status of the genera in the ophiuroid family Ophiolaeididae: Time to take out the trash? A11

Klinger, T.S., E.W. Mitcheltree, J.M. Lawrence, and A.L. Lawrence. Effect of temperature, water flow, and feed formulation on feeding, respiration, and production of *Strongylocentrotus droebachiensis* (Echinodermata:
Knott, K. E. Molecular phylogeny of the forcipulatida (Asteroidea).
Lawrence, J. M., C. M. Pomory, and B. Wawrik. Eccentricity of the apical system and peristome of sand dollars (Echinodermata: Echinoidea). A17
Lawrence, J. M., and J. Sonnenholzer. The sea urchin *Tripneustes depressus*, the sea cucumber *Selenkothuria theeli*, and the starfish *Phataria unifascialis* (Echinodermata) at Punta Los Frailes and Punta Carnero (Ecuador). A17
Mah, C. Is the Labidiasteridae (Forcipulatacea: Asteroidea) paraphyletic? A11
Pomory, C. M., and M. T. Lares. Regeneration of arms in *Luidia clathrata* (Echinodermata: Asteroidea) in the field, Tampa Bay, Florida. A10
Turner, R. L. The tagmatized echinoderm. A12
Turner, R. L., and J. A. Wood. Limits to salinity tolerance of the brackish-water brittlestar *Ophiophragmus filograneus*. A14


(Communicated by Daniel Blake)

Organising Committee

Chair: M. Daniela Candia Carnevali

Members: Francesco Andrietti
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Erminio Giavini
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This is the complete list of abstracts of the 5th European Conference on Echinoderms that will be held in Milan from 7th to 12th September 1998.

Visit the University of Milan web page for more information regarding the conference (including participants, addresses and e-mails).

http://imiucca.csi.unimi.it/ echino/5ece7.htm

(Communicated by Francesco Bonasoro)

DEVELOPMENTAL BIOLOGY
Ecology Functional Biology Physiology and Behaviour Paleontology and Phylogeny Reproductive Biology

Vitturi, R., A.M. Pirrone, M.S. Colomba, L. Toia, R. Barbieri. Chromosome mapping of ribosomal RNA genes in sea urchin. Poster

Barbieri, R., and V. Izzo. Isolation and characterization of L8 ribosomal protein gene in the sea urchin Paracentrotus lividus. Poster


Byrne, M. Evolution of larval form in the australian sea-star genus Patirriella. Oral

Long, S., V. Morris, M. Frommer, and M. Byrne. Hox-type homeobox genes in the starfish Patirriella exigua. Poster

Chee, F.C., and M. Byrne. Serotonin-like expression in the larvae of Patirriella species (Asteroidea) with different modes of development. Does serotonin have morphogenetic and sensory roles? Oral

Chen, W., P.W. Beesley, and M.C. Thorndyke. Neural regeneration in Asterias rubens and homeobox genes. Poster

Byrne, M., M. Thorndyke, F. Chee, P. Cisternas, and A. Feldman. Localisation of the neuropeptide Sl in the larvae of the sea star Patirriella regularis as revealed by confocal microscopy. Poster


Cocchiarella, F., A. Piscopo, E. Nargi, M. Piscopo, M. Branno, F. Aniello, and L. Fucci. Long 3ÆUTRs of Paracentrotus lividus embryo mRNAs and mRNA instability. Poster
De Amaral, P., C. Nunes, P. Gosselin, and M. Jangoux. Comparative morphology of postlarvae in regular and irregular echinoids. Poster

Giudice, G. The sea-urchin development: present and past. Invited Speaker

Gosselin, P., and M. Jangoux. GABA and glutamic acid induce the metamorphosis of Paracentrotus lividus larvae (Echinodermata, Echinoidea). Poster


Zito, F., S. Sciarino, G. Toia, A. Cusimano, R. Bonaventura, and V. Matranga. Perturbation of morphogenesis in sea urchin embryos cultured in the presence of a McAb to Pl-nectin, an ECM protein. Oral


Sato, Y., and I. Yazaki. Analysis of the apoptotic effects of L-Glutamine on the larval cells in sea urchin metamorphosis. Poster

Selvakumaraswamy, P., and M. Byrne. Unusual account of an ectoderm derived coelom and the occurrence of schizocoely in ophiuroid larvae. Oral

Spirlet, C., P. Gosselin, and M. Jangoux. The structure of the axial complex of Paracentrotus lividus (Echinodermata:Echinoidea) at the end of post-larval life. Poster


Vaitilingon, D., and M. Jangoux. Influence of food ration on larval development of the edible sea urchin Paracentrotus lividus (Echinodermata) during metamorphic period. Poster

Wray, G.A. Genes involved in the evolution of Echinoderm morphology. Invited Speaker

ECOLOGY
Developmental Biology Functional Biology Physiology and Behaviour
Paleontology and Phylogeny Reproductive Biology


Blockmans, B., C. De Ridder. The intradigestive distribution of symbiotic ciliates in Paracentrotus lividus. Poster

Borzone, C.A. Influence of Mellita quinquiesperforata beds on the structure of subtidal benthic communities of sandy beaches. Poster

Bulleri, F., L. Benedetti-Cecchi, and F. Cinelli. Experimental analysis on the effects of grazing of Paracentrotus lividus and Arbacia lixula in shallow subtidal reefs on the west coast of Italy (Western Mediterranean). Oral

Candia Carnevali, M.D., S. Galassi, F. Bonasoro, G. Dina, M.A. Terlizzi, M. Patruno, and M.C. Thorndyke. PCB-induced environmental stress and the regenerative response in crinoids. Poster
Catoira Gomez, J.L., and L.J. Mªguez Rodríguez. Deformations in skeleton and analitic of tissues in a population of *Echinus esculentus* L. 1758 (Echinodermata, Echinoidea) under oil polluted conditions in a Coruña Bay (Galicia, Spain). Poster

De Jesus, D.C., and A.D. Abreu. Soft bottom Echinoderms of Madeira Island (Portugal): First results (Systematic). Poster

Dominguez, P., M.A. Ramos, J.M. Remón, and M. Villena. Echinoderms from the oceanographic expedition fauna (Project fauna ibérica) and Museo Nacional de Ciencias Naturales Collections. Poster

Emson, R.H. Making the best of it. The ecology of deep sea Echinoderms. Invited Speaker

Fanelli, G., S. Piraino, L. Esposito, and F. Boero. Echinoderms as keystone species and biodiversity depressors in marine communities. Poster

Fernandez, C., and A. Caltagirone. Evidence of *Paracentrotus lividus* (Echinodermata: Echinoidea) migration in a coastal lagoon determined from the study of demographic structure. Poster

Freeman, S.M., C.A. Richardson, and R. Seed. Spatial distribution, abundance and foraging behaviour of *Astropecten irregularis* (Echinodermata: Asteroidea). Oral

Fujita, T. Population structure of a fissiparous sea star *Coscinasterias acutispina*. Oral

Goggin, C.L. Biological control of the introduced seastar *Asterias amurensis*. Oral


Deheyn, D., E. Lamarque, and M. Jangoux. Arm regeneration in *Amphipholis squamata*. Poster


Lefebvre, A., and D. Davoult. Vertical distribution of the ophioplutei of *Ophiothrix fragilis* (Echinodermata: Ophiuroidea) in the Dover strait (Eastern English Channel). Poster

Mac Cord, F.S., and L.F.L. Duarte. Patterns of spatial distribution in populations of *Tropiometra carinata* (Lamarck) (Crinoidea: Comatulida) at São Sebastião, São Paulo, Brazil. Poster

Pastore, M. Echinoderms of the Gulf of Taranto (Mediterranean, Ionian Sea). Poster

Stabili, L., M. Pastore, and R.A. Cavallo. Microbiological accumulation and survival rates of *Paracentrotus lividus* and *Holothuria polyi*. Poster

Nilsson, H.C. Interaction between water flow, oxygen depletion and sublethal predation on growth of the brittle star *Amphiura filiformis*. Oral


Scheiblauer, S., and T. Reinthaler. Ecological monitoring of *Holothuria tubulosa* and *H. polii* (Echinodermata: Holothuroidea) in nearshore waters of Elba, Italy. Poster

Skern, R., N.T. Hagen, and E.N. Hegseth. Benthic algal spores do not survive digestion by *Strongylocentrotus droebachiensis*. Poster

Stübing, D., W. Hagen, and D. Piepenburg. Feeding ecological of arctic Echinoderm: evidence from lipid and stomach content analyses. Poster
FUNCTIONAL BIOLOGY
Developmental Biology Ecology Physiology and Behaviour Paleontology and Phylogeny Reproductive Biology


Deheyn, D., N. De Bremaeker, D. Vaitilingon, and J. Mallefet. Immunolocalization of SALM-Famide neuropeptides S1 and S2 in Ampipholis squamata (Ophiuroidea, Echinodermata). Poster

Grawe-Baumeister, J. Morphological comparison of the Upper Jurassic sea urchin Gymnocidaris agassizii and the recent Heterocentrotus mammillatus and the palaeoecological conclusions. Oral


Welsch, U. The functional bauplan of Echinoderms. Invited Speaker

PHYSIOLOGY AND BEHAVIOUR
Developmental Biology Ecology Functional Biology Paleontology and Phylogeny Reproductive Biology


Dupont, S., F. Bieswal, and J. Mallefet. Characterization of a population of *Amphipolis squamata* (Ophiuridea) from Oliveri-Tindari's lagoon (Sicily). Poster

Hagen, N.T., Å. Andersen, and O.B. Stabell. Alarm response of *Strongylocentrotus droebachiensis* induced by chemical labelling of *Anarhichas lupus*. Oral

Hill, S.K. The effects of food level and temperature on the energy budget of *Arbacia punctulata* (Arbaciidae) and *Lytechinus variegatus* (Toxopneustidae). Oral

Hollertz, K. Response to food by the heart urchin *Brisopsis lyrifera*. Oral

Inoue, M., R. Birenheide, and T. Motokawa. Holothurian neuropeptide NGIWy-amide: localization and effects on muscles. Poster


Mallefet, J. Physiology of Bioluminescence in Echinoderms. Invited Speaker


Stancyk, S.E. Predatory behaviour of Echinoderms. Invited Speaker

Wilkie, I.C., M.D. Candia Carnevali, and F. Bonasoro. Evidence for the "cellular calcium regulation hypothesis" from "simple" mutable collagenous structure: the brachial and cirral syzigial ligaments of *Antedon mediterranea*. Oral

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**PALEONTOLOGY AND PHYLOGENY**

Developmental Biology Ecology Functional Biology Physiology and Behaviour

Reproductive Biology

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Ausich, W.I. Origin of Crinoids. Invited Speaker


Bohn, J., A.V. Smirnov, and T. Heinzeller. Comparison of the Bourgueticrinid and Isocrinid aboral nervous system, possible phylogenetic implications. Poster


Dean, J. The Ordovician divergence of asteroids and ophiuroids. Oral

De Ridder, C., and S. Weinberg. *Asthenosoma marisrubri* n. sp. and *Asthenosoma varium*, the story of a confusion. Poster

Dominguez, P. Early evolution of Echinoderms: class Ctenocystoidea revisited. Oral


Gil, D., P. Dominguez, and M. Torres. Ordovician evolutionary faunas of Echinoderms and Carpoids from southern Spain. Poster

Hagdorn, H. Traumatocrinus, an extraordinary Triassic crinoid. Oral

Hagdorn, H. Triassic ophiuroids (Aspiduriella) brooding in an empty ceratite shell. Poster


Heinzeller, T., and U. Welsch. The echinoderm complex of hydrocoel/ectoneural cord and the chordate complex of notochord/neural plate - analogous or homologous? Poster

Hess, H. Habitat and lifestyle of crinoids from some fossil assemblages. Oral

Ishida, Y., and F. Fujita. Dense population of fossil and extant Ophiura sarsii (Echinodermata, Ophiuroidea) in Japan. Oral

Indeherberge, L., E. Defour, R. van der Ham, and J.W.M. Jagt. What is Micraster ciplyensis Schlüter, 1897? (Late Cretaceous Echinoids). Poster

Jagt, J.W.M. Echinoderms and the K/T boundary in the Maastrichtian type (SE Netherlands, NE Belgium). Poster

Jagt, J.W.M. Notes on two late Cretaceous comatulid crinoid genera. Poster

James, D. The phylogeny of Echinodermata: total evidence and parameter sensitivity. Oral

Jeffries, R.P.S. Which way up were the Mitrates? - Flat surface up. Oral

Jeffery, C.H. Brooding it over: the first occurrence of nonplanktotrophy in echinoids. Oral


Madon-Senez, C. Plate pattern of echinoid tests: relative length of the labrum and of the sternal plates in recent antarctic schizasterids (Spatangoidea). Poster

Manni, R., and U. Nicosia. The oldest cyrtocrinid, Nerocrinus petri n. gen. n. sp., and the Nerocrinidae n. fam. Oral

McNamara, K.J. Biogeographic evolution of cenozoic Echinoids in western Australia. Oral

Milsom, C. Rovings of the Roveacrinids. Oral

Moussa, B., D. Neraudeau, J. Lang, and E.P. Verrecchia. Characterization of the morphological variability in Linthia (Maastrichtian/Paleocene Echinoid of Iullemmeden Basin; West Africa). Poster

Nebelsick, J. Taphonomic legacy of predation on Echinoids. Oral


Neumann, C. Cretaceous Echinoids from Jordan. Poster

Oji, T., and T. Mito. Skeletal development of Oxycomanthus japonica and its paleontologic implications. Poster

Parsley, R.L. The Cincta (Homostelea) as Blastozoans: Oral


Rozhnov, S.V. The crookedness of the stem and crone of the pelmatozoan echinoderms as a result of heterochrony. Oral

Sevastopulo, G.D., P.W. Jackson, R.J. Prokop. Functional morphology of Pygmaeocrinus (Disparida; Crinoidea). Oral


Smirnov, A.V. The origin and evolution of the order apodida (Holothuroidea). Oral

Smith, A.B., and A.S. Gale. Sea-levels, sequence stratigraphy and Echinoid diversity through the Cretaceous. Oral


Sumrall, C.D., and J. Sprinkle. The early ontogeny of the glyptocystid rhombiferan Lepadocystis moorei. Oral

Thandar, A.S., and V. Rajpal. Some thoughts about the "supergenus" Thyone Jaeger (Echinodermata: Holothuroidea). Poster

Villier, L., and M. Kutscher. New Lower Jurassic evidence of fossil Asteroids and comments on their diversity. Poster

Widdison, R. Crinoid faunas of the Much Wenlock Limestone Formation of Britain. Poster

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**REPRODUCTIVE BIOLOGY**

Developmental Biology Ecology Functional Biology Physiology and Behaviour Paleontology and Phylogeny

Barker, M.F. Reproduction and feeding in Ophiopsammus maculata (Echinodermata: Ophiuroidea) on the Otago coast, Southeastern New Zealand. Oral

Bonasoro, F., M.D. Candia Carnevali, F. Sala, M. Patruno, and M.C. Thorndyke. Regenerative potential of crinoid arm explants. Poster


Conand, C., and S. Uthicke. Asexual reproduction in population of Stichopus chloronotus (Holothuroidea): a comparison between Pacific and Indian Ocean populations. Poster

Cook, E.J., and M. Kelly. The effects of stocking density on the growth (somatic and gonadal) and survival of the green sea urchin (Psammechinus miliaris). Oral


Sköld, M., M.F. Barker, and P.V. Mladenov. The role of environmental factors in regulating asexual reproduction in the sea star Coscinasterias muricata: effects of food availability and fluctuating temperature. Oral

Thorndyke, M.C. Regeneration in Echinoderms. Invited Speaker

Alves, S.L.S., A.D. Pereira, and C.R.R. Ventura. Sexual and asexual reproduction in a population of Coscinasterias tenuispina (Lamarck 1816) from Rio de Janeiro, Brazil. Poster


Ventura, C.R.R. Gametogenesis and growth of two Astropecten species from midshelf upwelling region, Cabo Frio, Brazil. Poster

Young, C.M., S. George, T. Griffin, D. McCarthy, and S. Brooke. The food required for reproduction in bathyal Echinoids. Oral

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Sven Hörstadius passed away in Sweden on 16 June 1996 at 98 years of age. Long a Professor at the University of Uppsala, he had been awarded an honorary doctorate at the Sorbonne in 1954.

His experimental work on what was called developmental mechanics, since the time of W. Roux, was famous. Echinoderm eggs and sea urchin embryos have long served as experimental models essential for our understanding of the mechanisms of fecundation and early development of metazoans. Following notably Boveri and Driesch, Sven Hörstadius carried out a remarkable series of experimental procedures showing the evolutionary possibilities of cell lines from isolated blastomeres, or from combinations of blastomeres of different regions of very young morulae. He showed, among other things, the inductive role of micromeres on the blastomeres destined to form the vegetative plaque and the archenteron.

Sven Hörstadius carried out his experimental work using the marvelously precise techniques of microdissection with needles and of in vivo staining; this enabled him to correct certain erroneous interpretations by Driesch. He interpreted the results of his own experiments, in agreement with J. Runnström, in considering that two important gradients of opposing substances extended from one extremity to the other of the egg's primordial axis. These substances, respectively “animalizing” or “vegetalizing”, would affect the differentiation of a “harmonious” larva by their relative quantities.

In his studies of development of the sea urchin egg, a “regulated” egg, Sven Hörstadius called attention to what would later be called negative inductive interactions. This work is still topical, as in the recent research of the Americans E. H. Davidson, R. A. Cameron, R. J. Hardin and others, all based on the quantity and quality of Hörstadius’s experimental results. The “double-gradient” hypothesis is challenged by Davidson, who has studied the expression of molecular markers specific for embryonic tissue, the activity of transcription system of the genome during egg segmentation, and the determination or specificity of the parent or founder cells of cell lines. Davidson proposes a new explanation of the development of the sea urchin: he suggests that the specification of the founder cells for the cell lines giving rise to the five polyclonal territories of the blastula must depend, among other elements, on the utilization of maternal factors localized according to the primordial axis of the embryo.

Writing these lines, I am reminded of the researchers who occupied what was known in Roscoff as the “Swedish table”, everyone in the group from the Wenner Gren Institute of Experimental Biology in Stockholm, animated by J. Runnström and the teaching staff of the University of Uppsala, who came regularly to Roscoff between 1946 and 1956, and among these, Per Eric Lindhal accompanied by the young Bertil Swedmark.

It was during this period that Sven Hörstadius published his more physiological findings, those on animalizing and vegetalizing substances, with Trygve Gustafson, and those conducted with J. F. Danielli and I. J. Lorch on the effects of the enucleation of eggs.

At that time, Sven Hörstadius was a very well-known man, physically squared-off, almost stiff. Thanks to the counsel of Bertil Swedmark, I discovered, behind that classic façade of a “University Professor,” a very subtle man, attentive and smiling, who even knew how to set off student applause by his transformation into a remarkable mime at a party given at the “Hotel de la Marine”. What the embryologists and the regulars at marine research stations didn’t usually know, was HörstADIUS’s real passion for photography and birds: he was one of the founders of the World and Wildlife Fund.

Fifty years have passed, and biology has undergone a complete mutation. Many biologists famous in their time are already almost forgotten. The name of Sven Hörstadius remains brilliant, so strongly has his work marked the biology of development.

Claude Levi
Muséum National d’Histoire Naturelle, Paris
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NOTE FROM THE EDITOR

Welcome to the ninth Beche-de-mer Information Bulletin. This issue contains contributions from the various fields of sea cucumber biology and fishery, arranged as in the previous issues. The number of members is still increasing, and we hope that the new members will contribute to future issues.

Since the last issue, the highlight has been the symposium devoted to echinoderm fisheries and aquaculture during the International Echinoderm Conference, which was held in San Francisco in August 1996. The abstracts are presented here (see p. 26) and the papers will be published in 1997 by the editor A.A. Balkema (Rotterdam). The increase in overexploitation, now spreading to many coastal zones of the tropical East Pacific is one of the issues discussed.

An original approach is also being carried out in a traditional exploitation country—Madagascar—in the context of a regional programme (Commission de l'Océan Indien (COI), GICZ). To achieve sustainable exploitation of this fragile resource, the exporters have decided to organise the profession (see p. 4).

Several contributions update the state of the fisheries, as in Tuvalu (see p. 2), California and Washington State (see p. 11 and 12), Torres Strait reefs (see p. 17).

In the rubrique ‘Asexual reproduction by fission’ new observations are reported for the first time on the species Holothuria leucospilota (see p. 5) which had been previously cited as reproducing only sexually.

A new rubrique on aquaculture could also be prepared (see ICLARM results in the Solomon Islands, p. 3). We are looking forward to your suggestions and contributions.

Chantal Conand
Editorial

This 10th edition of the Bulletin gives us an opportunity to review the progress made in the 'sea-cucumber sector' information system in broad terms. After beginning in the tropical Pacific, the Bulletin has gradually acquired a wide international audience, while sea cucumber fisheries, often a source of conflict, have grown.

Readers, I would like to thank all those who have already contributed to the Bulletin, and ask that you take an active role in its improvement, as many of you have already indicated that the Bulletin is useful for you. I would be very interested in having your opinion on the following questions:

- Is the current presentation by section, i.e. 1) New Information, 2) Correspondence, 3) Publications, satisfactory?
- Which section should be given more space?
- In the 'New Information' section, parts on 'In situ spawning observations' and 'Asexual reproduction through fission observations' have been introduced. This issue will for the first time include a part on 'Aquacultural information', with help from S. Battaglione at ICLARM. Are there any other new parts that you would like to see included?

Your suggestions and comments are both useful and necessary.

This Bulletin includes original articles on the resources of several different countries, including Malaysia (p. 2); Madagascar (p. 7-13); Sulawesi, Indonesia (p. 31); and Mozambique (p. 34). Many different aspects of the biology of asexual reproduction through fission (p. 15) and identifying specimens are discussed. And a contribution on the aquaculture of the species Stichopus japonicus (p. 24) will certainly meet the expectations of those interested in this activity.

Chantal Conand
Echinoderms:
San Francisco

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RICH MOOI
California Academy of Sciences, San Francisco, California, USA
MALCOLM TELFORD
University of Toronto, Ontario, Canada

The texts of the various papers in this volume were set individually by typists under the supervision of each of the authors concerned.

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FAUNA SINICA

Phylum Echinodermata
Class Holothuroidea

by
Liao Yulin

A Major Project of the National Natural Science Foundation of China in the Period of the Eighth Five-Year Plan (Supported by the State Science and Technology Commission of China, the National Natural Science Foundation of China and the Chinese Academy of Sciences)

Science Press
Beijing, China
1997
This book is a volume of Fauna Sinica which deals with a class Holothuroidea of the Phylum Echinodermata occurring in Chinese waters. The number of species including is 134, belonging to 57 genera in 15 families of 6 orders.

The vast majority of the material on which the present study has been based is found in the collections made by the Institute of Oceanology, Academia Sinica during the past forty years along the whole coast of China, including the offshore Xisha Islands in the South China Sea. Some of the specimens came from shore collecting but most were taken by extensive benthic sampling, north from the Pohai Sea south to the Gulf of Tonkin and Hainan Island during Programme of Oceanographical Cruises of China carried out in 1958—1960.

The bathymetrical range covered is from the intertidal zone to about 200 meters, exceptionally more the approximate extent of the continental shelf.

The text contains two parts; a comprehensive survey and a systematic descriptions. The former part provides the historical review, morphology, system of classification, geographical distribution, biology and economic significance of holothurians. The latter part covers the systematic account for Holothuroidea of China, diagnoses are given for the higher taxa above species, keys to aid identification and details of the ranges of the species, among other observations. All species are figured.

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FOSSILS OF OHIO

Rodney M. Feldmann, Editor-in-Chief
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BULLETIN 70

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Fossils of Ohio, in preparation for more than 5 years, has chapters written by leading experts in Ohio and other states. The book clearly explains how to collect fossils, where to find them, how to prepare and care for them, and how to identify them. Identification keys accompany many chapters, allowing the collector to key out specimens. Numerous photographic plates depict well-preserved examples of fossils commonly found in Ohio rocks and sediments. A chapter on the geology of Ohio and the principal fossil-bearing rock units is a useful guide to searching for fossils. An extensive list of references to technical papers on various fossils will be a valuable aid to advanced amateurs and professionals. A glossary of technical terms and indexes of generic and specific names are included. Fossils of Ohio should be in the library of anyone who is interested in the magnificent record of past life preserved in rocks and sediments in all 88 Ohio counties.

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