CULTIVATION OF SYMBIOTIC PIGMENT-PRODUCING BACTERIA FROM THE ACCESSORY NIDAMENTAL GLANDS OF THE SQUID *LOLIGO PEALEI*.

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Females of the squid *Loligo pealei*, like many other teuthoid and sepioid cephalopods, bear a pair of accessory nidamental glands that are colonized by bacteria. The gland changes from colorless in immature animals to mottled red-orange in reproductively mature animals, and the color has been attributed to the symbiotic bacteria. To begin addressing the role pigment-producing bacteria may play in reproduction of the squid, bacteria from the accessory glands of mature female *L. pealei* were cultured and examined. The glands were found to contain a mixed assemblage of six or more different types of bacteria. In culture, one type produced transparent red-orange pigmented colonies similar in appearance to the color of the gland. To determine if this bacterial type was responsible for the red-orange color of the gland, pigments were extracted from one of these isolates and compared by HPLC analysis with pigments extracted directly from the gland of a mature female. The gland was found to contain a major pigment structurally similar to sepiaxanthin (absorption maxima of 490 and 525 nm) and a small amount of an astaxanthin-like 4-keto carotenoid. The pigment produced by the red-orange bacterial isolate was very similar. Thus, the red-orange isolate may be the bacterial type responsible for the color of the *L. pealei* gland. Similar red-orange pigment-producing bacteria were isolated also from the accessory nidamental glands of *Sepia officinalis*, *Loliguncula brevis*, and *Sepioteuthis lessoniana*. The red-orange isolates were found to be gram-negative, motile by polar flagella, non-luminous, asporogenous rods that require salt for growth and do not ferment glucose. In combination with the distinctive pigmentation, these characteristics apparently distinguish these isolates from previously described bacterial groups. Consequently, the red-orange isolates may be a new bacterial species. Future work will focus on changes in the bacterial assemblage during maturation of the squid, the mode by which symbiotic bacteria are transferred to the new squid generation, and the effect of the red-orange pigment-producing bacteria on survival and development of the squid.

ANATOMICAL VARIATION IN A POPULATION OF *OMALONYX* SP. AND ITS IMPLICATIONS FOR THE SYSTEMATICS OF SUCCINEID LAND SNAILS.

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Six preserved adults from a population of *Omalonyx* sp. collected along 0.5 km of the banks of a canal in Caruaru, Northeast Brazil, were dissected in detail. The reproductive, nervous, digestive and muscular systems were studied following the methods of Hoagland & Davis (1987).

Large-scale variation in the general body organization and pattern of its development has been observed. The penial organ is variously lies on left, right or mid-line of the body. The penial retractor insertion (a character important to species definition in the literature) is on the vas deferens, either a short distance from epiphalic head or very close to it. The internal penial sculpture (another weighted character) varies significantly in pattern and extent. The hermaphroditic duct varies from almost straight to contorted. The body retractor muscles may pass either inside or outside the glandular oviduct. From external view, one or two receptacula seminis can be visualized. In the radula, the transverse rows are slightly V-shaped and the significance of the modification of endocones into small cusps into a serated appearance is here reported for the first time.

These results indicate that the standard characters, particularly of the reproductive system, used for systematics of the Succineidae may not be fixed within all species.

DIAGNOSTIC EGG HULL SCULPTURING OF AN EPIZOIC CHITON.

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A chiton described from Bird Rock, San Diego County, California as *Cyanoplax dentiens* (Gould, 1846) *cryptica* Kues, 1974 [= *Lepidochitona cryptica* (Kues, 1974)] has only been found living on the shallow subtidal brown alga, *Eisenia arborea* Areschoug, 1876, on which it apparently feeds. In January, 1990, three chitons were taken from *Eisenia* at the type-locality for *L. cryptica* and were identified as such by comparisons to the original diagnosis and the holotype specimen. One of the collected *L. cryptica* was a female with a mature gonad, permitting examination of egg hull sculpturing with SEM. The sculpturing proved to be distinct from the already investigated egg hull sculpturing of other members of *Lepidochitona* Gray, 1821 that are morphologically similar to *L. cryptica*, including *L. dentiens* (Gould, 1846) and especially *L. berryana* Eernisse, 1986. Other morphological attributes, besides egg hulls, are suggested to be equally diagnostic, confirming the elevation of *L. cryptica* to specific status.

POTENTIAL IMPACT OF A SEASONAL MIGRATORY JUMBO SQUID (DOSIDICUS GIGAS) POPULATION ON A GULF OF CALIFORNIA SARDINE (SARDINOPS SAGAX CAERULEA) STOCK.

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Dosidicus gigas inhabits the Central Eastern Pacific. Annually, the species migrates with different intensities in and out of the Gulf of California. In 1979-1980 an unusually large squid population was observed in the Gulf. Extensive research on that migratory population resulted in new insights about the biology and population dynamics of D. gigas. Further analyses are presented in this paper which indicate that S. sagax caerulea was a significant component in the jumbo squid diet. A quantitative assessment of the potential sardine biomass consumption by D. gigas was determined by integrating biological components into a population simulator. The results indicate that up to 50,000 metric tons of S. sagax caerulea may have been consumed by D. gigas during its nine months residence in the Gulf of California. Drop in total sardine landings during the 1980/1981 fishing season may be attributed at least in part to an unusually high sardine mortality which may have been induced by squid predation.