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MARKET ACCEPTANCE OF THE SUNRAY VENUS CLAM (*MACROCALLISTA NIMBOSA*) CULTURED IN FLORIDA.

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The sunray venus clam is being considered as an alternative species for commercial hard clam growers in Florida. Current trial production efforts appear successful. Hatchery and growout costs appear to be similar to hard clams. However, the market acceptance of the cultured sunray venus clam needs to be demonstrated within the Florida market area. A group of four restaurants agreed to participate in a market acceptance study: one each in Cedar Key, Apalachicola, Gainesville, and Bronson. Each restaurant received a given number of cultured sunray venus clams each week fro a period of four weeks. The chefs in each restaurant were allowed to serve the calms utilizing any preparation manner they chose and to charge any price they wished. The wait staff were instructed to ask each patron who consumed the calms to complete a brief tableside survey. The survey solicited the patron's reaction to various attributes of the sunray venus clams they just consumed, as well as some respondent demographic information. The survey findings provide insight into the acceptance of cultured sunray venus clams as a viable seafood product and the willingness of consumers to purchase the product again. This information will help growers assess the viability of sunray venus clams as an alternative candidate culture species.

EVALUATION OF HYBRID HARD CLAMS (*M. mercenaria* AND *M. campechiensis*) FOR FLORIDA AQUACULTURE: RESULTS OF LABORATORY CHALLENGES

Shirley M. Baker, Leslie N. Sturmer, and John Scarpa

The northern hard clam, *Mercenaria mercenaria*, is an important aquaculture species in the state of Florida. Over the past decade, mortality events resulting from hurricanes, low salinities, and, potentially, high water temperatures, have affected production. The local southern quahog *Mercenaria campechiensis* may offer improved production characteristics and hybridizes readily with the northern hard clam. Therefore, a rigorous examination of parental species and their crosses under laboratory (this study) and commercial conditions has been initiated. Parental species and their crosses, representing two families, were exposed to salinities of 15 or 25 ppt and hypoxic or normoxic dissolved oxygen levels with temperature held constant at 32^{o}C (90^{o}F) for 28 days. Observations of clam mortality were conducted at 24 hour intervals. Survival analyses indicate that *M. mercenaria* x *M. campechiensis* crosses performed better under stressful conditions than did the parental species or the reciprocal cross. In addition, one family performed better, overall, than did the other family. Supported by FL Sea Grant.

SENSORY CHARACTERIZATION PROGRAM FOR HARD CLAMS, *MERCENARIA* SPP.

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A new 'sensory characterization' program is being developed for hard clams *Mercenaria* spp. based on established protocol with screened and trained panelists. The intent is to provide a non-bias, science-based tool to help direct commercial practices and decisions for marketing and maintaining product standards. Initial efforts have developed rating scales and standards for aquacultured clams from Florida and two other states based on profiling differences and unique attributes for appearance, texture, basic tastes, aroma and flavors. This program can be used by investigators assessing product quality and shelf-life, or commercial interests trying to distinguish products by location, season, or process. Users can be trained with established standards and actual products to rate and describe the unique character of the products in question. Popular use could lead to local product distinctions or appellations that stimulate and attract consumer interests.

EVALUATION OF THE SUNRAY VENUS CLAM *MACROCALLISTA NIMBOSA* FOR AQUACULTURE IN FLORIDA

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The sunray venus clam is being evaluated as a potential new aquaculture species to diversify the hard clam culture industry in Florida. Wild broodstock were collected, conditioned, spawned and larvae reared through setting: pediveligers (~220 μm) appeared at 7 days at 26-28^{o}C and 28-30ppt. Land-based culture of juveniles occurred in downwellers with a 46-63% return. A feed density trial was initiated with juveniles to determine maximum cell density for growth. Triplicate 4-L beakers each containing 24 clams (42±3 mg) were fed 0, 50, 100, or 200 K cells/mL of *Isochrysis* sp. twice/day over a four week period. Growth (absolute and % change) did not increase above the 100K cells/mL treatment. Filtration rates, in general, decreased with increasing cell density. Sunray venus clam seed [about 118,000, 9.3-18.5 mm shell length (SL)] were field-planted in nursery systems (soft bags or hard cages) and have exhibited 32-94% survival and 0.117-0.252 mm SL daily growth rate over 4 months. Currently, sunray venus clams are being reared in growout systems (bags, bags with internal frames, cages, and bottom plants) at densities of 20-70/ft^2, a portion of which will be used to test market perception.
This research was supported by Florida Sea Grant (Project R/LR-A-44).

CULTURE OF HARD CLAM HYBRIDS (*MERCENARIA MERCENARIA, M. CAMPECHIENSIS*): HATCHERY TO FIELD-NURSERY

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The Florida hard clam culture industry is based primarily on the "notata" variety of the northern hard clam *Mecenaria mercenaria*, which may not be suited for some Florida environments. The local southern hard clam *M. campechiensis* may have suitable production characteristics for Florida environments and readily hybridizes with *M. mercenaria*, but is known to gape during refrigerated storage. Therefore, an examination of production characteristics of these species and their hybrids has been undertaken. Cultured *M. mercenaria notata* and wild *M. campechiensis* were used as broodstock. Five separate single-parent crosses were accomplished. Nuclear DNA amounts in larvae, as measured by flow-cytometry using DAPI stain, differed slightly (six fluorescent units) between the parental species, but hybrids sometimes exhibited values of only one parental type. Allozyme marker analysis indicated that in two of the crosses, at least one parental clam was a hybrid, thus making DNA amounts unsuitable for identifying hybrids. This genetic analysis reflects the difficulty of using visual characteristics to differentiate between species that naturally hybridize. Survival among the remaining three families in land-based nursery culture using raw seawater ranged from 73-82%. Approximately 670,000 seed (shell length 7.9-13.1 mm) were planted in the field for continued culture comparison. Supported by USDA-CSREES.

EVALUATION OF THE SUNRAY VENUS CLAM *MACROCALLISTA NIMBOSA* UNDER FIELD NURSERY AND GROWOUT CULTURE CONDITIONS IN FLORIDA

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The sunray venus clam *Macrocallista nimbosa* was commercially fished in Florida during the 1970s. Although natural growth rates were estimated to be high, its patchy distribution limited commercial exploitation. The sunray venus clam is now being evaluated as a potential new aquaculture species to diversify the hard clam culture industry in Florida. In this study, production performance under field nursery and growout conditions was examined. Approximately 118,000 hatchery-produced sunray venus seed (9-18 mm shell length, SL) were field-nursed in soft bottom bags or hard cages at densities of 100-550/ft^2. After 42-119 days, survival ranged from 32-94% with 0.12-0.25 mm/day SL growth. Sunray venus juveniles (27 mm SL; 10 mm shell width, SW) were further cultured in hard cages at densities of 42-55/ft^2. After 11 months, sunray venus (61-67 mm SL, 22-23 mm SW, 30-37 grams total weight, 8.1-9.1 condition index) were harvested for market perception tests. Survival ranged from 50-82%. Production performance of sunray venus grown in soft bags, soft bags with internal frames, and bottom plants for a year at densities of 38-70/ft^2 will also be reported. To date, field nursery and growout culture methods for sunray venus clams are exhibiting little difference from hard clam methods.

CREATING A "FLORIDA-FRIENDLY" HARD CLAM THROUGH INDUSTRY-DRIVEN APPLIED RESEARCH PROJECTS

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The Florida hard clam culture industry is a dramatic success story with over 350 small-scale businesses providing an economic impact of $49 million. Yet, it has expanded primarily through increased acreage and number of growers rather than increased productivity. Over the past decade, mortality events resulting from hurricanes, low salinities, and, potentially, high water temperatures have affected production. Recently, a growers' organization obtained federal funds through the U.S. Department of Agriculture to support applied research addressing these concerns. A statewide taskforce identified needs and set priorities to direct research efforts. For example, the local southern quahog *Mercenaria campechiensis* may offer improved production characteristics and hybridizes readily with the cultured northern hard clam *M. mercenaria*. Therefore, a rigorous examination of parental species and their crosses under commercial conditions has been initiated with industry partners. Other industry-driven projects developed to better understand mortality events include 1) deployment of temperature data loggers in clam bags at multiple leases to provide detailed, broad coverage of water temperatures, 2) health surveys of cultured clams from commercial leases, and 3) assessment of lease substrate properties using a soils-based approach. Annual workshops allow researchers to present findings/progress and obtain feedback from industry members. (196 words)