

Aquaculture & Fishery Biology

- VI Sem B.Sc. Zoology – Elective Paper

Swapana Johny
Asst. Professor
Dept of Zoology

MUSSEL CULTURE



MUSSELS

- BIVALVE MOLLUSCS FOUND ATTACHED TO ROCKS AND OTHER HARD OBJECTS IN COASTAL SEA
- SEEN IN LARGE CROWDS ON ROCKY SHORES - MUSSEL BEDS
- IMPORTANT SOURCE OF MEAT FOR COASTAL POPULATION
- MEAT – SOFT, TASTY & RICH IN NUTRIENTS

COMPOSITION OF MUSSEL MEAT

- 6-8% GLYCOGEN
- 11-13% PROTEINS
- 2-3%FATS
- MINERALS – Ca, P, Fe, I, etc.
- VITAMINS A & B Complex
- MUSSEL SHELL – Lime production & Manure

GREEN MUSSEL – PERNA
VIRIDIS

BROWN MUSSEL – PERNA
INDICA



MUSSELS

GREEN MUSSEL

- PERNA VIRIDIS
- ENJOYS WIDER DISTRIBUTION IN INDIA – BOTH EAST & WEST COAST
- IN KERALA FROM QUILOON TO KASARGOD
- FOUND IN INTERTIDAL REGION UPTO DEPTH OF 15M

BROWN MUSSEL

- PERNA INDICA
- RESTRICTED DISTRIBUTION
- ALONG SOUTH WEST COAST FROM VARKALA TO KANYAKUMARI
- ALONG SOUTH EAST COAST KANYAKUMARI TO THRUCHENDUR
- INTER TIDAL ZONE UP TO DEPTH OF 10M

MUSSEL GROWTH



MUSSEL GROWTH



ADVANTAGES OF MUSSEL CULTURE

- TOLERATE WIDE RANGE OF SALINITIES- FIT FOR ESTUARINE CULTURE
- FASTER GROWTH RATE - 4 MONTHS INSTEAD OF 12 MONTHS
- SEEDS AVAILABLE CONTINUOUSLY - 2 OR 3 CROPS
- FILTER FEEDERS – PLANKTONS. NO NEED OF ARTIFICIAL FEED
- HIGH YIELD THAN ANY OTHER AQUATIC ORGANISM

SELECTION OF SITE

- UNPOLLUTED AND SHELTERED SEAS
- CLEAN WATERS
- ABUNDANT PHYTOPLANKTON
- MODERATE WATER CURRENT- BRING IN FOOD & CARRY WASTE PRODUCTS
- OPTIMUM SALINITY 30-35 PPT
- OPTIMUM TEMPERATURE 21-30° C

COLLECTION OF SEEDS

- “SPAT” – MUSSEL UNTIL IT REACHES ABOUT 1CM FROM SETTLEMENT
- YOUNG MUSSEL – ‘SEED’
- COLLECTED DURING SPAWNING SEASON FROM MUSSEL BEDS
- COLLECTED ON ROPES, POLES, BAMBOO STAKES, COCONUT SHELLS, LARGE BIVALVE SHELLS

DISADVANTAGES

- DISTRIBUTION LIMITED TO ROCKY SHORES
- SPAT FALL HIGH -LIMITED VELIGER GET CHANCE TO SETTLE & HEAVY MORTALITY
- DISTURBS NATURAL POPULATION

MUSSEL SEEDS



SEEDS ON ROPE



INDUCED SPAWNING

- SLIGHT DISTURBANCES IN HANDLING & CLEANING
- PHYSICAL, CHEMICAL, THERMAL & ELECTRICAL METHODS
- ROUGH HANDLING INDUCES FULLY RIPE MUSSELS TO SPAWN
- OPENING SHELL & POKING ADUCTOR MUSSELS

INDUCED SPAWNING

- 6% H₂O₂ SOLUTION AT pH 9 FOR 1-2 HRS & THEN TRANSFER INTO FRESH SEA WATER INDUCE SPAWNING (CMFRI)
- DIPPING IN AMMONIUM CHLORIDE OR BARIUM CHLORIDE
- GRADUAL INCREASE IN TEMPERATURE (4°C RISE). SAFE AND PRODUCTIVE METHOD
- MALES SPAWN FIRST WHICH INDUCES FEMALES TO SPAWN

INDUCED SPAWNING

- TRANSFERRED TO PURE SEA WATER TANKS
- FERTILIZED EGGS DEVELOP TO FREE SWIMMING LARVAE
- LARVAE FED WITH UNICELLULAR ALGAE
- SPAT FORMATION FROM 20TH DAY ONWARDS FOR A PERIOD OF 5-10 DAYS
- COLLECTED ON SUITABLE COLLECTING MATERIALS – COIR ROPES, NYLON NETS, COCONUT SHELS
- YOUNG SEEDS FEED ON PHYTOPLANKTON

CULTURE TECHNIQUES

- **BOTTOM CULTURE**
- **POLE CULTURE**
- **RACK CULTURE**
- **RAFT CULTURE**
- **LONG LINE CULTURE**

BOTTOM CULTURE

- SUITABLE FOR SHALLOW AND ENCLOSED AREAS
- SEA BOTTOM MADE READY FOR MUSSEL SEEDS AND TRANSPLANTED
- NOT PREVELANT IN INDIA

BOTTOM CULTURE



TUBE NETTINGS FOR CULTURE



POLE CULTURE

- FOR FARMING ON MUDDY COASTS WITH GENTLE SLOPES AND MARKED TIDAL VARIATIONS
- A SERIES OF WOODEN OR BAMBOO POLES OF 3-6M LENGTH DRIVEN INTO THE BOTTOM
- BOTTOM COVERED WITH PLASTIC SHEETS TO PREVENT ENTRY OF PREDATORS

POLE CULTURE



POLE CULTURE



RACK CULTURE

- FIXED STRUCTURE MADE UP OF SEVERAL WOODEN POLES DRIVEN INTO SEA BOTTOM
- WOODEN PLATFORM MADE OVER IT
- PRACTICED IN SHALLOW WATERS

RACK CULTURE



RACK CULTURE



RAFT CULTURE

- COMMONEST METHOD OF MUSSEL FARMING IN INDIA
- RAFTS MADE WITH BAMBOO POLES OR TEAK WOOD TIED WITH ROPES
- FLOATS ARE PLACED
- ANCHORED TO BOTTOM USING LONG AND STRONG CHAINS
- SEEDS COLLECTED ON ROPES HUNG VERTICALLY

RAFT CULTURE



RAFT CULTURE



LONG LINE CULTURE

- CULTURING BIVALVE MOLLUSCS IN OPEN SEAS
- SERIES OF FLOATS IN OPEN SEA CONNECTED WITH A LONG ROPE
- VERTICAL STRINGS ATTACHED TO LONG LINE
- SUITABLE FOR SHALLOW ESTUARIES AND BAYS WITH LITTLE TIDAL VARIATIONS
- FAST GROWTH RATE AND HIGHER PRODUCTION REPORTED

LONG LINE CULTURE



LONG LINE CULTURE



HARVESTING

- ON REACHING MARKETABLE SIZE, THE ROPES ARE MANUALLY REMOVED
- RAFTS BROUGHT TO SHORES FOR REMOVING ROPES
- CROP WASHED WITH WATER AND MUSSELS SEPARATED USING SHARP WOODEN WEDGES
- SORTED ACCORDING TO SIZE AND MARKETED

HARVESTING

- GREEN MUSSEL GROWS FASTER TO MARKETABLE SIZE IN 4 MONTHS
- BROWN MUSSEL TAKES 6-7 MONTHS
- BY PROPER MANAGEMENT TWO-THREE CROPS PER YEAR.

HARVESTING



HARVESTING



MUSSEL MEAT





THANK YOU