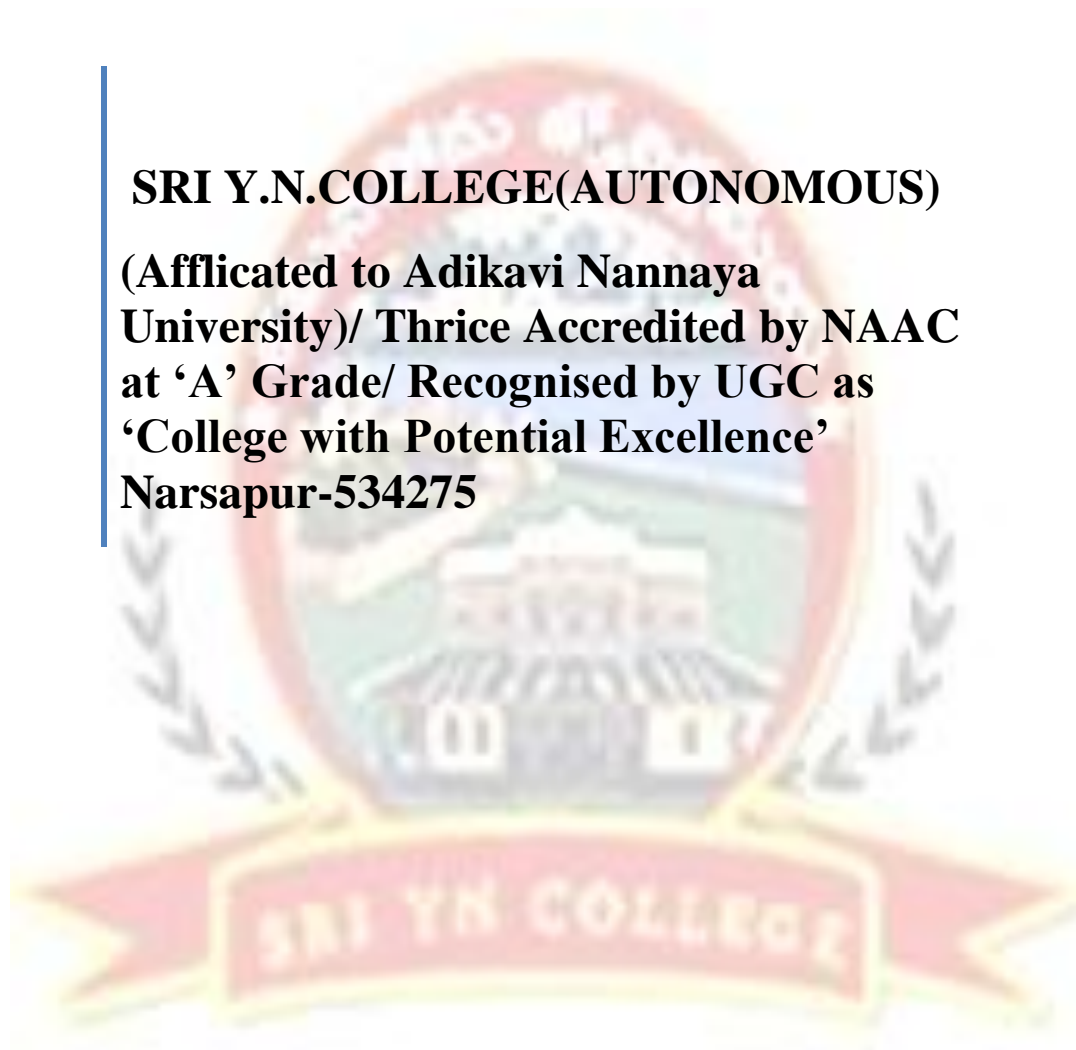
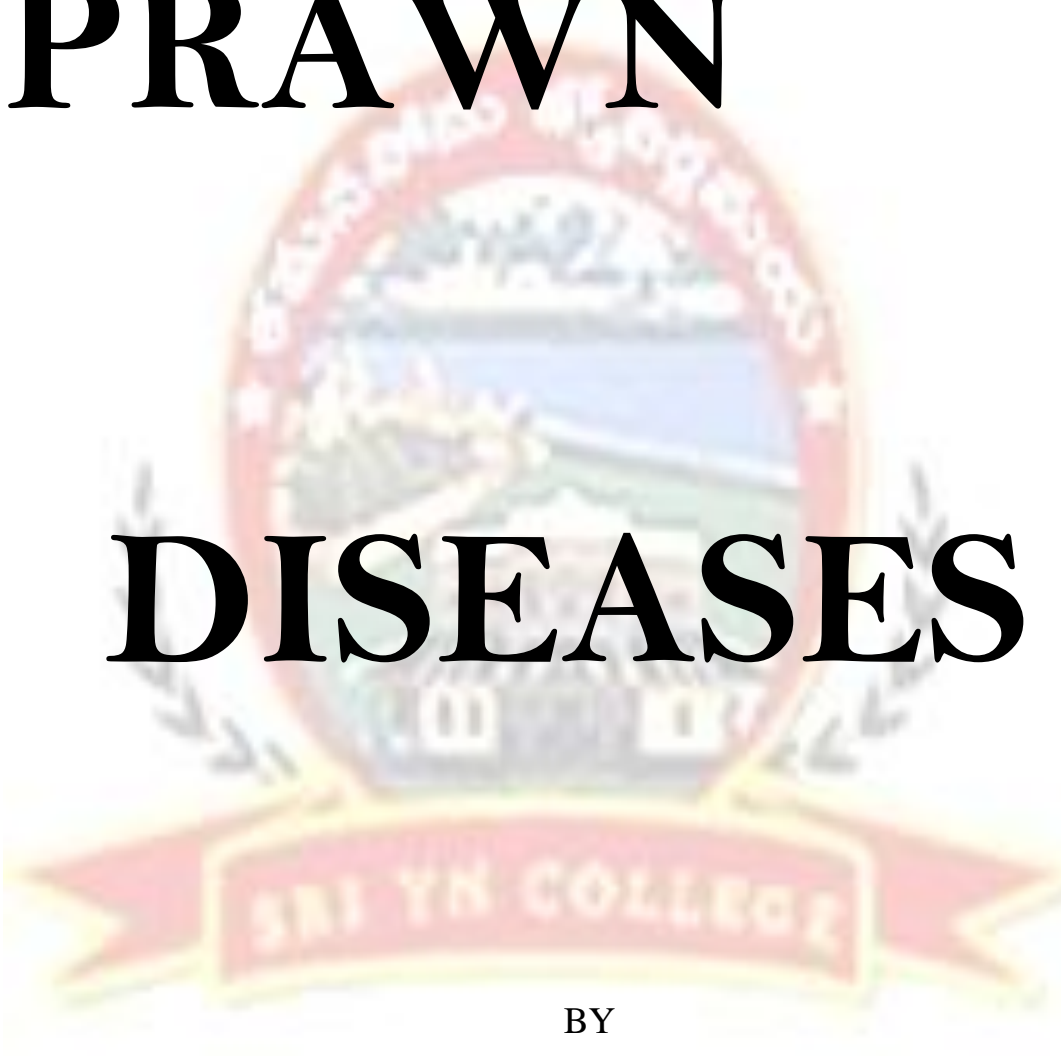


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PRAWN DISEASES



BY

MOHAMMED. ANNAMANI

MOSUGANTI. PRANEETH

CERTIFICATE

SRI Y.N.COLLEGE

NARSAPUR

DEPARTMENT OF AQUACULTURE

CERTIFIED THAT THIS A BONIFIED REPORT OF PROJECT WORK
ENTITLED IDENTIFICATION OF SOME PRAWN DISEASES IN AGARTIPALEM
BY MOHAMMED. ANNAMANI AND MOSUGANTI. PRANEETH OF BSC(FINAL)
DURING THE ACADEMIC YEAR 2019-2020.

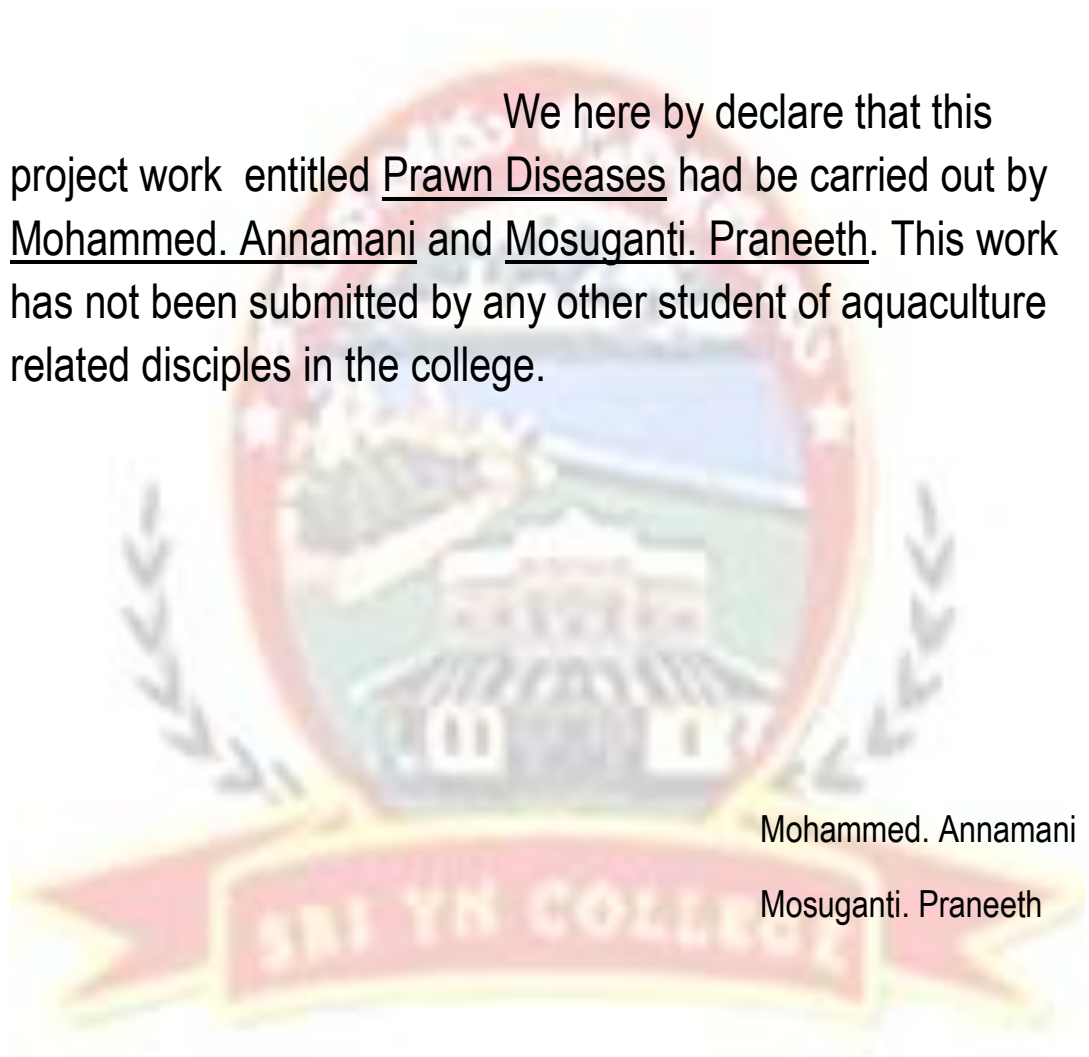
SIGNATURE OF THE
HEAD OF THE DEPARTMENT

DECLARATION

We here by declare that this project work entitled Prawn Diseases had be carried out by Mohammed. Annamani and Mosuganti. Praneeth. This work has not been submitted by any other student of aquaculture related disciples in the college.

Mohammed. Annamani

Mosuganti. Praneeth



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MOHAMMED. ANNAMANI

MOSUGANTI. PRANEETH

INTRODUCTION

In the quest of higher economic return through increased production by adapting high yielding technique is maximum utilization of space and food of all the riches of aquaculture system, the aspect of poor husbandry, over crowding unsuitable water quality and dietary imbalances are often forgotten. The result being stress conditions of animals leading to disease in aquaculture that tends to rebuke production and returns to the farmers.

The saying “ **prevention is better than cure**” still holds good with our present knowledge about the etiology of the disease and effective control. Our understanding of the host-agent-environment introduction is incomplete

Even though many disease agents are present in the environment epizootics can be avoided through elimination of stress conditions that manifest otherwise for the cultured organisms.

To days economy requires maximum output of fish/prawn/crab per acre metre of water. In our pus to maximize production, overfeeding and over crowding often occur. High immonia levels, which are a natural consequence, act as primary nutrients. For blue green celgae and other undersirable plant forms. Blue green algae have been cratal as responsile for

the generation of “**off flavor**” in aquaculture. The resulting picture is that of a choked pond overgrown with algae and plant bloom, severe dissolved oxygen problems, off flavor fish and prawn and often a stressful environment suitable for disease episodes. Disease develops through the introduction of the host, (fish/prawn) the pathogen (captive agent) and the environment. In the presence of a susceptible host a pathogen and predisposing environmental conditions healthy prawn and absence of disease agents would therefore lessen the chance of a disease outbreak.

The causal agents may be pathogenic organisms (Viruses, bacteria, fungi, protozoa, helminths, microcrustaceans) (or) non-pathogenic adverse environmental conditions (extreme temperature, low O₂ levels chemical pollution). Living organisms cause infectious diseases, which result in gradual mortalities. Non-living disease agents cause non-infectious diseases, that result in sudden mass mortality.

The environment determines the balance between the prawn as host and the disease agent. Micro-organisms are always present in the water and some of them cause disease only when the prawn has been weakened through exposure to stressful environmental conditions.

In aquaculture too the saying “ *prevention is better than cure*” can be adopted by the farmers to prevent diseases by maintaining optimal water

quality conditions. Through the usual water quality management practices like water exchange and aeration, one can generally prevent diseases in extensive and improved extensive (or) semi intensive (or) intensive farming practices. But these methods alone will not be successful in sustained high production farms along better technologies. Application of therapeutic agents and chemicals is practised in order to prevent (or) cure disease.

Ponds and its surroundings include absorption of heat, photosynthesis and supply of O_2 within the pond; heat exchange, and Volume changes caused by evaporation and precipitation, changes in the volume of a pond are very important as they affect the concentration of dissolved substances and correspondingly requirements for treatment.

Good prawn farming is achieved when the pond and surroundings make chemical and physical exchanges at a steady state. When all of the processes balance, a state of equilibrium is achieved. Pond equilibrium is the optimum set of conditions for prawn culture, a state completely in harmony with Nature.

High density prawn culture past the production capabilities of a pond to the limit. It causes substrate stress to our balanced system often removing it from equilibrium pond dynamics. The result is a shift in the system towards pond food conversion, slow growth disease and possibility of mortality. When a pond system at equilibrium is stressed, the pond will

adjust it self in an effort to retrieves equilibrium unfortunately, such our adjustment usually means discored prawn production.

To detect the onset of disease early careful monitoring of prawns in ponds is essential. The apperanced and ehaviour of prawns may give clear signs of onset of diseases. For early detection of diseases, in ponds the following signs of disease can serve as guidelines.

- (a) Loss of appetite
- (b) Abnormal change in colour
- (c) Exoskeletal //rot/ lesion/ erosion
- (d) Physical depormity
- (e) Opaque muscle
- (f) Abnormal swmming
- (g) Abnormal condition colour of grills
- (h) Lethargy
- (i) Slow groth
- (j) Increased exskeletal epiboint
- (k) Abnormality prolonged soft shelliong
- (l) Mortality

In case of disease outbreaks without any characteristic manifestation, the prawn can narrow down on the probable cause of the diseases by observing the mortality pattern..

1 Gradual increasing mortality over several days to weeks are usually caused by micro organisms(Virus, Bacteria, Fungi, parasites) or Nutritional deficiencies.

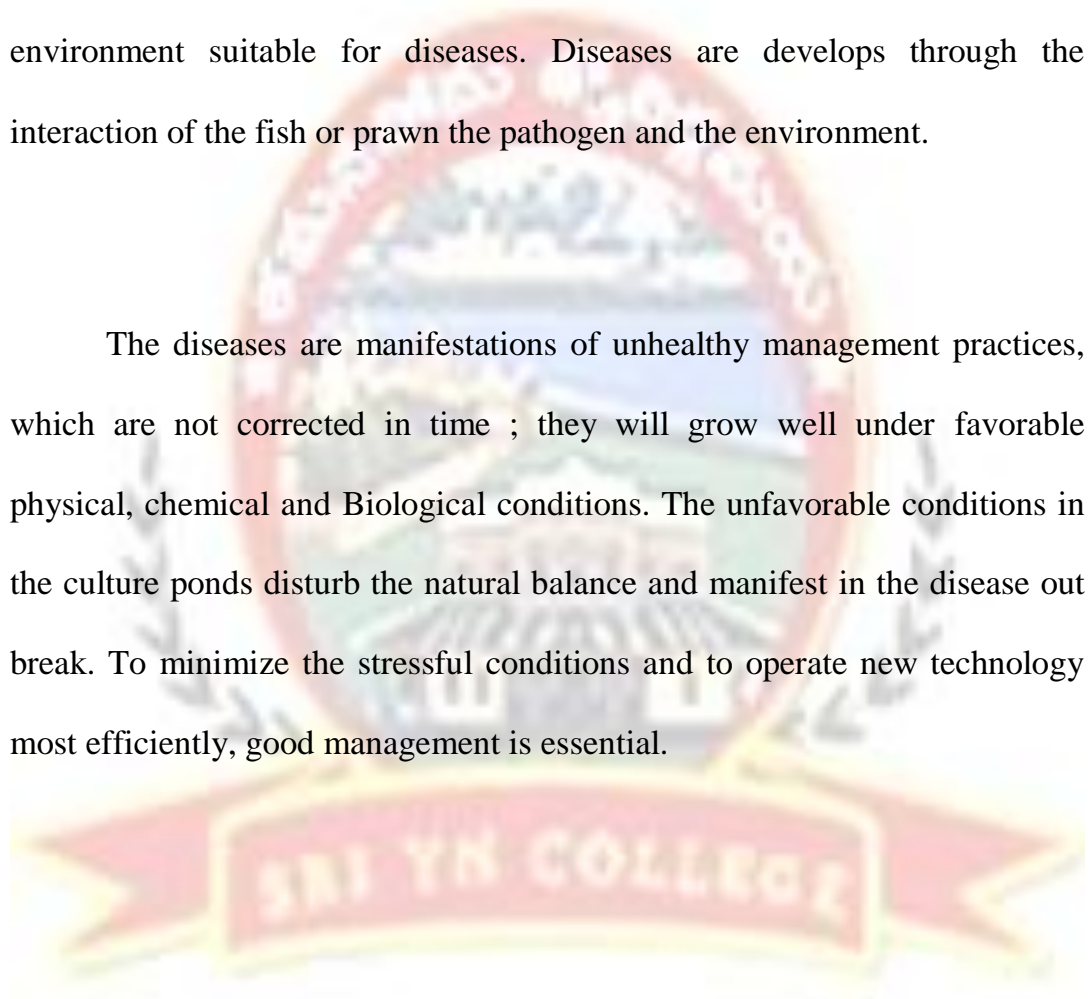
2. sudden mass mortalities are generally associated with adverse physio – chemical parameters (low dissolved oxygen, acidic or high ammonia/ nitrate levels, thermal shocks, salinity shocks toxic substances etc)

For detecting the cause, regular monitoring and recording of physio-chemical parameters, like temperature turbidity, dissolved oxygen salinity, ammonia nitrite and checking pond bottom conditions, food consumption etc are very useful.

Poor husbandry over crowding unsuitable water quality and dietary imbalances are the major factors for occurrence of diseases in prawn culture system.

Today's Economy requires maximum output Aquatic organisms per unit area of water. In our push to maximize production, over feeding and over crowding often occur. This leads physical, chemical and biological stress in the pond. The resulting picture is that of a choked pond, over grown with algae and plant boom, severe DO₂ problems and a greatly stressful environment suitable for diseases. Diseases are developed through the interaction of the fish or prawn the pathogen and the environment.

The diseases are manifestations of unhealthy management practices, which are not corrected in time ; they will grow well under favorable physical, chemical and Biological conditions. The unfavorable conditions in the culture ponds disturb the natural balance and manifest in the disease outbreak. To minimize the stressful conditions and to operate new technology most efficiently, good management is essential.



USE OF CHEMICALS AND THERAPEUTIC AGENTS :

In aquaculture too, the saying prevention is better than cure can be adopted by the farmers to prevent diseases by maintaining optimal water quality conditions through the usual water quality management practices like water exchange and aerations.

One can generally prevent diseases in extensive and improved extensive farming practices. But these methods alone will not be successful in sustained high production farms using semi intensive and intensive farming technologies. Application of therapeutic agents and chemicals is being practiced in order to prevent or cure diseases.

COMMON DISEASES OF PRAWNS :

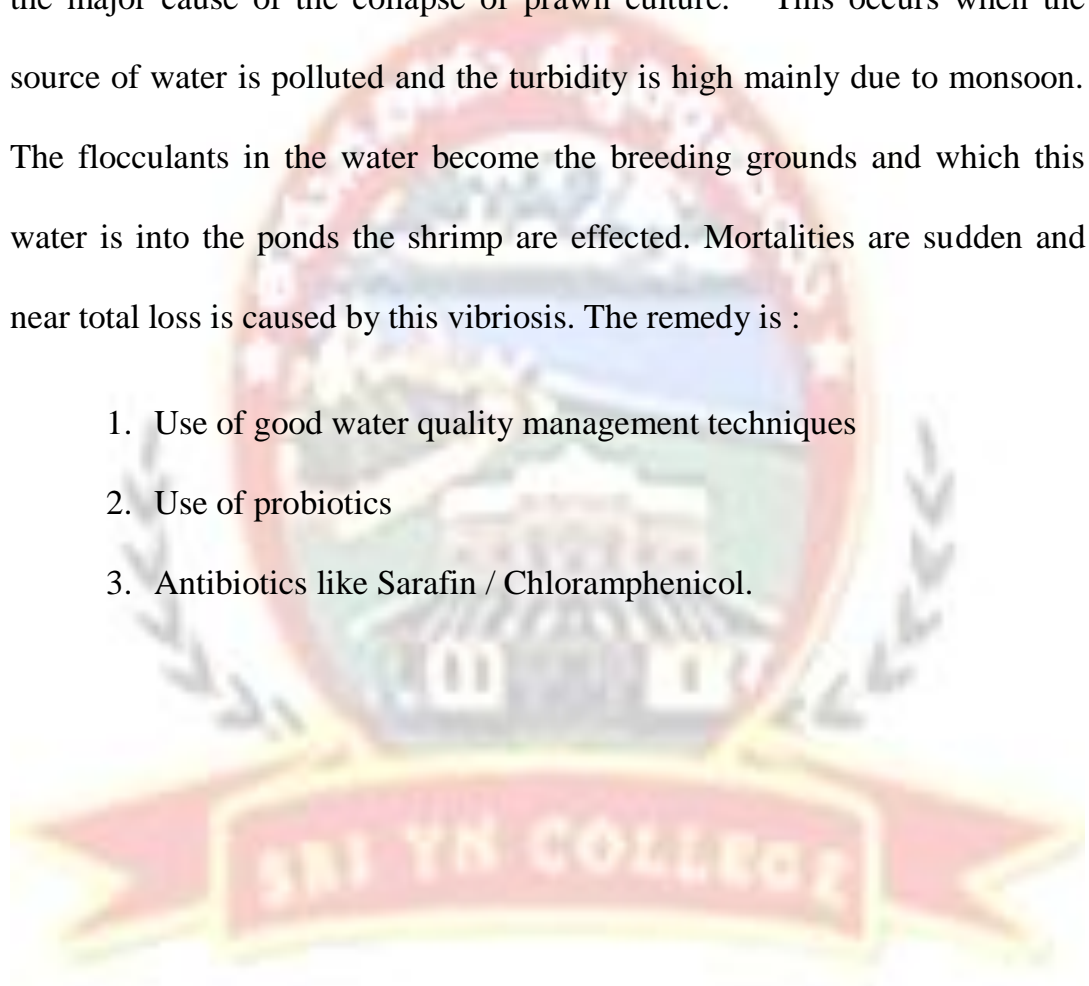
Fast growth in respect of brackish water prawn culture is noticed during the last decade due to importance of prawn as an export item.

Poor husbandry over crowding, unsuitable water quality and dietary imbalances are the major facts for occurrence of diseases in shrimp culture systems.

VIBRIOSIS

This is caused by vibrio species. They are similar to cholera causing bacteria in man. This causes the Haepatopancreas to become watery and the entire prawn become red in colour. In certain areas like Konaseema this is the major cause of the collapse of prawn culture. This occurs when the source of water is polluted and the turbidity is high mainly due to monsoon. The flocculants in the water become the breeding grounds and which this water is into the ponds the shrimp are effected. Mortalities are sudden and near total loss is caused by this vibriosis. The remedy is :

1. Use of good water quality management techniques
2. Use of probiotics
3. Antibiotics like Sarafin / Chloramphenicol.

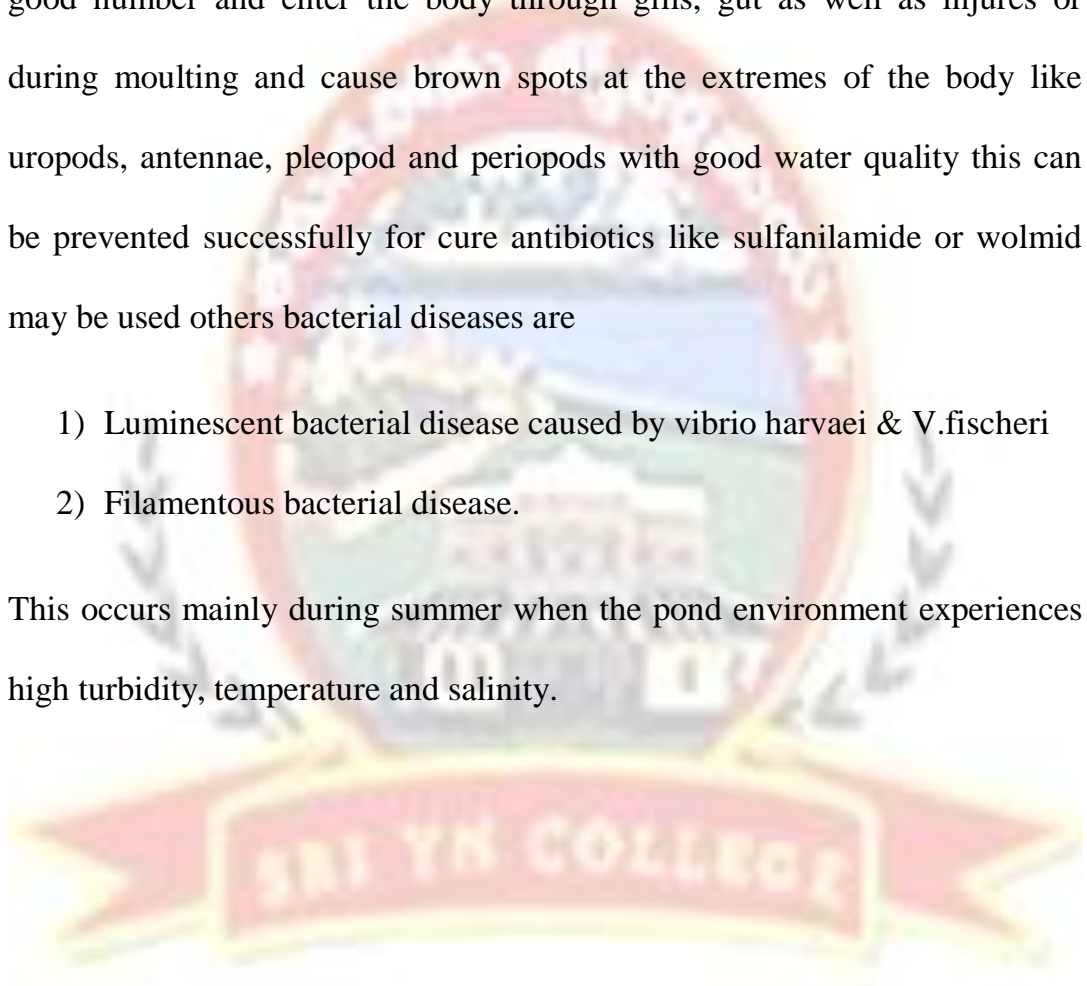


TAIL ROT

This is caused by pseudomonas and aeromonos species. These are called chitin eating bacteria or chitinoclaustic bacteria. These are facultative disease causing agents. When the pond environment is spoiled, they grow in good number and enter the body through gills, gut as well as injures or during moulting and cause brown spots at the extremes of the body like uropods, antennae, pleopod and periopods with good water quality this can be prevented successfully for cure antibiotics like sulfanilamide or wolmid may be used others bacterial diseases are

- 1) Luminescent bacterial disease caused by vibrio harvaei & V.fischeri
- 2) Filamentous bacterial disease.

This occurs mainly during summer when the pond environment experiences high turbidity, temperature and salinity.



ENVIRONMENTAL DISEASES



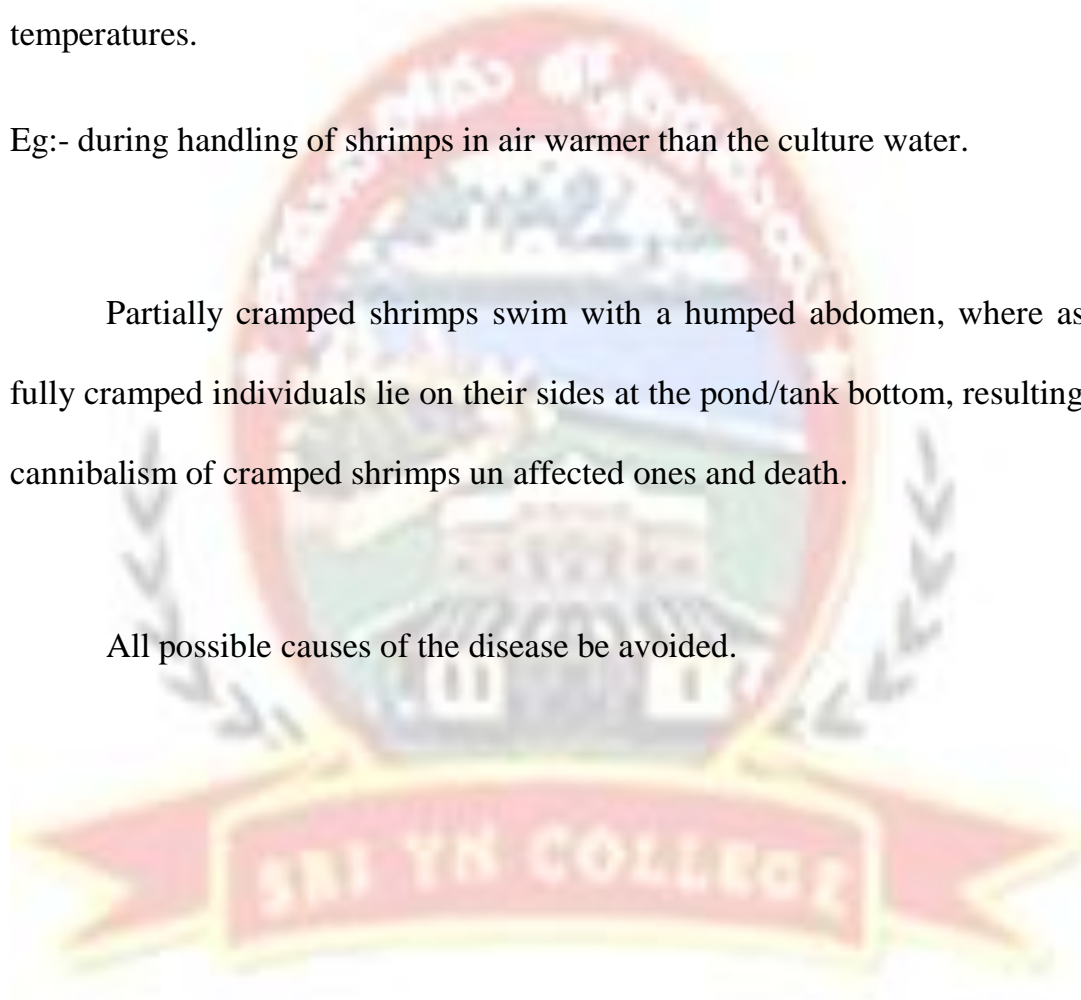
BODY CRAMP

Juveniles and adults show partial or complete rigid flexure of tail (when alive) possibly due to mineral imbalance or increased water and air temperatures.

Eg:- during handling of shrimps in air warmer than the culture water.

Partially cramped shrimps swim with a humped abdomen, where as fully cramped individuals lie on their sides at the pond/tank bottom, resulting cannibalism of cramped shrimps un affected ones and death.

All possible causes of the disease be avoided.



MUSCLE NECROSIS

Opaque white areas on the abdomen, blackening on edges of the Uropod followed by erosion, liquid filled boils at the tip of uropods in advanced stages occur in post larva, juveniles and adults P.Monodon, consequent upon successful environmental conditions like low oxygen levels, temperature or salinity shock. Overcrowding and severe gill fouling, resulting weakness and eventually death of Animals.

PREVENTIVE MEASURES :

Preventive methods include reducing stocking density in ponds giving Adequate feed but not over feeding and improving water quality by frequent or daily changing water of 5 to 10%.

YELLOW HEAD DISEASE

This is used to describe a condition which rapidly results in high numbers of mortalities. The condition was shown to be caused by a baculovirus by Dr.Boonyaapalin and Kasomchandra in 1992. The disease is characterized by pale body colour with yellowish gills and hepatopancrease although these signs can be seen in other disease. It is most commonly seen 50 to 70 days post stocking and has so far only been officially reported in Thailand. Histologically there is necrosis in a number of organs and prominent basophilic inclusions in the cytoplasm of various cel.

It has been suggested that a presumptive diagnosis can be made by examining smears of haemolymph. In cases of yellow-head disease, abnormalities should be observed in the haemocytes including shrinking of the nuclei breakdown of the nuclei and cytoplasm inclusions. The diagnosis should subsequently be confirmed by histology.

CAUSES :

It is important to differentiate yellow-head disease from other causes of mortalities. With yellow-head the best course of action in most cases is to conduct an emergency harvest, regardless of the stage of production.

It is hoped that ongoing research will provide additional means of diagnosis and control.

TOXIC DISEASES



BLACK GILL DISEASE

Larvae, post-larvae, juveniles and adults of *p.mondon* are affected by the disease due to chemical contaminants like cadmium, cu, oil, Zn, k, potassium permanganate, Ozone, ammonia and nitrate in rearing water. Ascorbic acid deficiency, heavy siltation and high organic load due to residual feed, debris and faecal matter on pond bottom also contribute to the Disease. Being affected, their gills show reddish, brownish to black discolouration and atrophy.

At the tip of filaments are affected and the gills become totally black. Physical deformities with dorsal side covered with a fog like substance, loss of appetite leading to mortalities. Secondary infections by bacteria, fungi and Protozoans on the dying cells of gills.

Overfeeding, be avoided with change of water frequently. Removal of black soil from the bottom during culture period, flushing out ponds. Several times during pond preparation and avoidance of heavy metal discharges into the rearing facilities.

Supplement diet with adequate amounts of ascorbic acid (<2000mg.pet kg of feed) or fresh algae if the disease is due to ascorbic acid deficiency.



BLUE DISCOLOURATION

Juveniles and adults of *p.mondon* is affected by the disease due to soil water quality problems i.e. acid, sulfale soils, high, organic wastes low dissolved oxygen levels and low levels of the carotenoid astaxanthin.

The disease with sky-blue colour instead of normal brown, black, absence of intense red colour after cooking is observed in intensive culture systems towards the End of grow-out culture period. Lethargic shrimps with shells sometimes soft and thin with rough surface are noticed in affected animals, with disrupted tubules in the Hepatopancreas.

PREVENTION :

Preventive measures and treatment of the disease include, supplementary diet with Vitamin-A or carotenoid sources like yellow corn 45 days after stocking, changing of 10 to 15% water volumes daily to reduce the hydrogen sulphide rich bottom layers of water, reducing stocking density and providing high quality food.

WHITE SPOT SYNDROME VIRUS

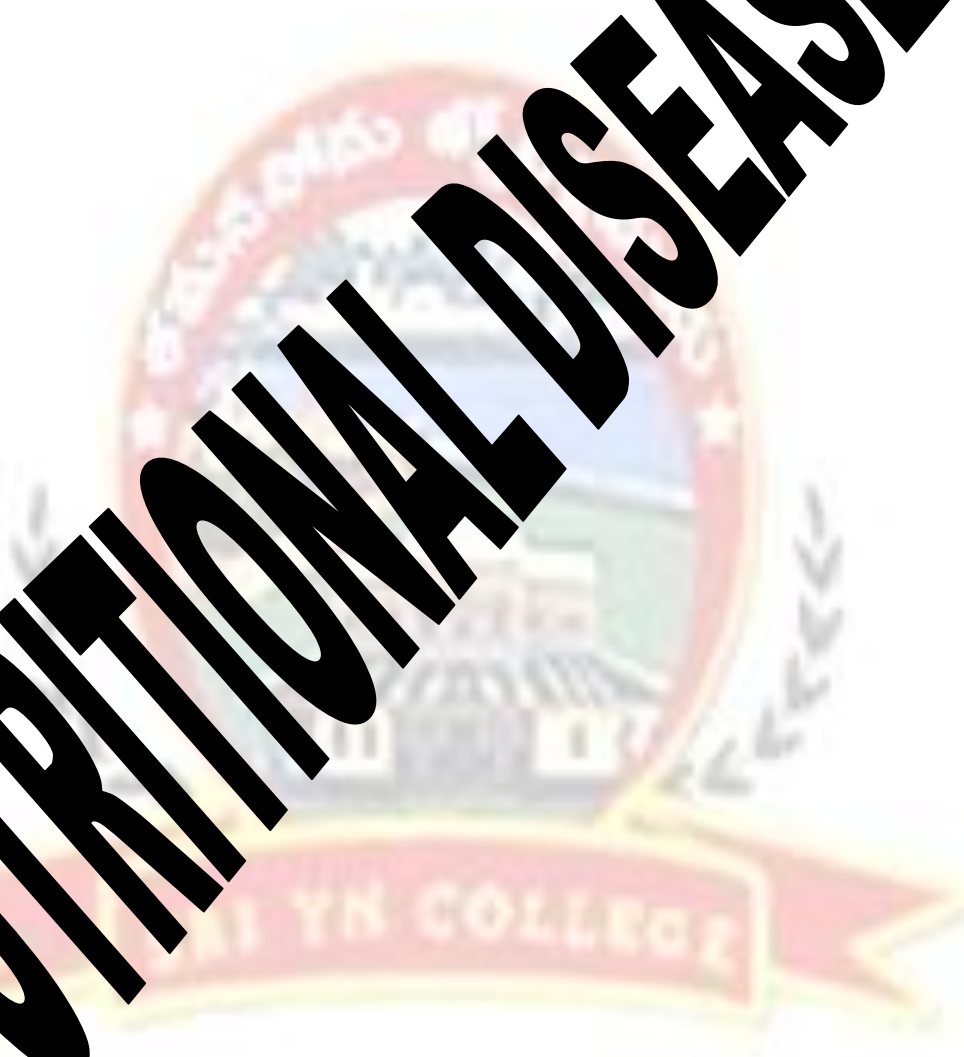
This was first noticed in the year 1992 to 1993 in china. It soon spread to all Asian countries. The effected shrimp develop small white spots on the carapace. In severely attacked prawns the Haepatopancreas becomes whity and pale white usually the mortalities are near total with in few days. It attacks all sizes i.e. 0.015 to 25 grams. The significance of the virus is it can infect a lot of non-penaeid and other crustacean organisms.

- | | | |
|-----------------|------------------|-------------------|
| 1) All penaeids | 2) Macrobrachium | 3) Palemon |
| 4) Thalamita | 5) Portunus | 6) Scylla Species |
| 7) Panulirus | 8) Copepods | 9) Insect larvae. |

There is no cure for viral disease. The only way is to prevent them from the stock and environment by suitable Technologies. The best methods are development of specific pathogen free stock of shrimp and breeding them in a highly secure hatchery system to develop brood stock. From where these brood stock has to be used in hatchery with due caution for contamination from water. This has to be supplied to the farmers after testing by P.C.R.

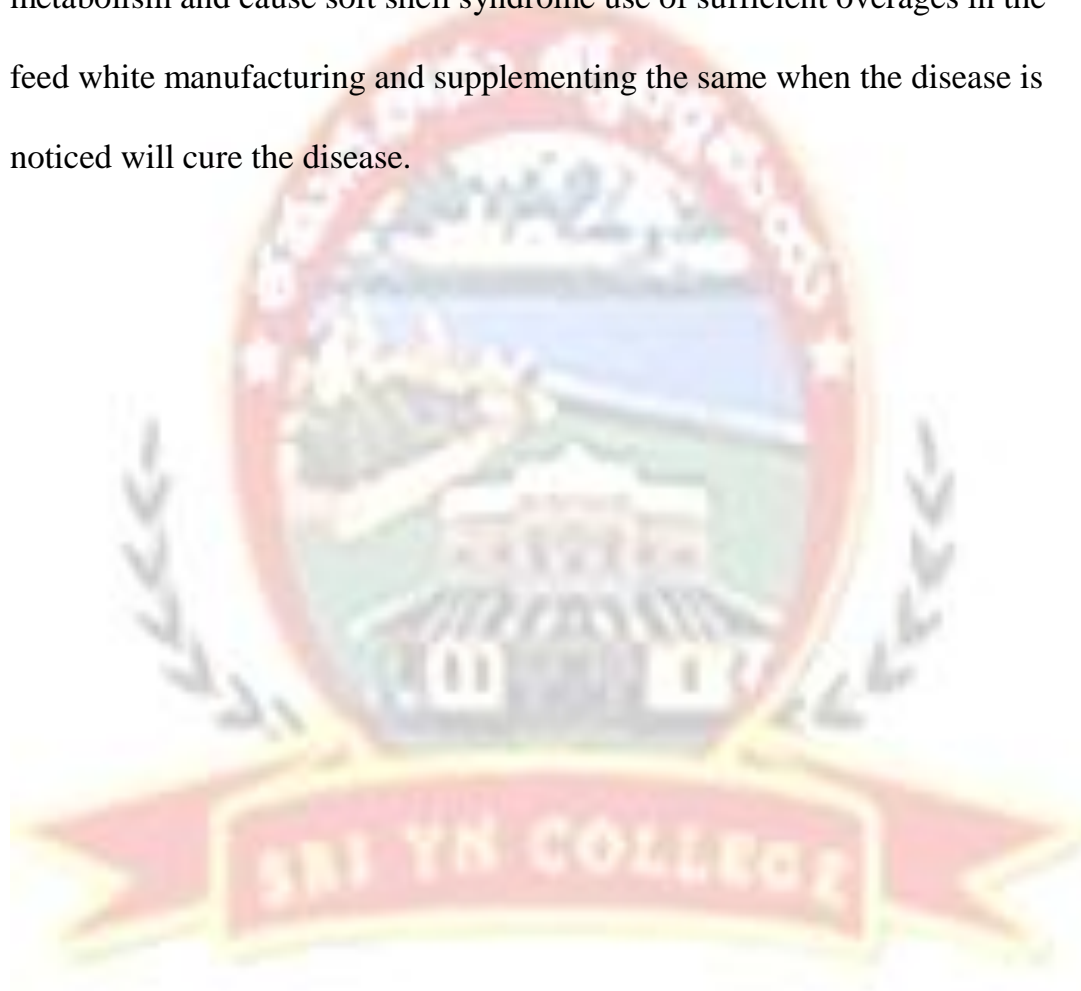
Culture practices have also to be modified to recirculation or closed circulation system. Water quality management and co-operative management of creek based management is also to be adopted to reduce the out break of diseases and to protect the natural stock from contamination other factors are Hybridization of viruses, genetically modified stock development and suppression of virulent gene or resorting to alternative species culture, that have to be tried.

NUTRITIONAL DISEASES



BLACK DEATH

Is caused by the deficiency of ascorbic acid in the calcium metabolism and causes soft shell syndrome. Use of sufficient overages in the feed will manufacture and supplementing the same when the disease is noticed will cure the disease.



SHELL DISEASES

Degrading of shell of larvae, post larvae, juvenils and adults of *P. monodon* by bacteria belonging to *Vibrio*, *Aeromonas* and *Pseudomonas* causing brownish to black erosion of carapace, abdominal segments, rostrum, tail, gills and appendages, development of blister containing cyanotic gelatinous fluid are the main symptoms of the disease. The affected shrimp becomes susceptible to cannibalism or dies from stress or energy exhaustion.

PREVENTIVE MEASURES :

Induced moulting besides, maintaining good water quality minimizing organic load of the water, handling, avoiding, over crowding and injuries of exoskeleton and providing adequate diet are the treatment and preventive measures.

As curative measure of gill and apppedage rot in shrimps chelacop at the rate of 500 gms/ac may be given

SOFT SHELLING DISEASE

Nutritional deficiency, pesticide contamination and poor pond water and soil conditions are the causative agents of the disease in penaeus monodon, juveniles and adults soft-shelling of shrimps is associated with high soil pH, low water phosphate ($>1\%$), low organic matter ($>7\%$) insufficient or infrequent water exchange, improper storage of feeds and lack of supplementary feeding in ponds with higher stocking densities.

Shell is thin and persistently soft for several weeks, shell surface dark, rough, wrinkled, and affected shrimps are weak. Affected shrimps become more susceptible to wounding, cannibalism, surface fouling by Zoothamnium, grow slow and eventually die.

Ponds should be flushed thoroughly, when using chemical pesticides, change water daily (20-50%) if possible or atleast once a week or every two weeks, maintain good quality pond soil and water and use good quality feeds.

Mussel meat at 8-14% of the body weight daily for 2-4 weeks or a diet containing a 1:1 ratio of calcium to phosphorus.

RED DISEASE

Late post larvae juveniles and adults of *P. monodon* are affected by the disease. Due to presence of aflatoxin in feeds associated with high inputs of line (2-6 tonnes/ha) in pond which has high initial pH prolonged exposure to low salinity (6-15 ppt) and rancid feeds especially after storage at high temperatures. The disease occur more frequently in the summer and autumn.

Due to the disease, there is a sudden drop in feed consumption, the animals become lethargic, body weakness and die within minutes after being lifted out of the water. Yellowish and reddish discolouration of the body and appendages noticed with reddish discolouration of the body and appendages noticed with red short streaks on gills, reddish colour of faecal matter, poor growth, atrophy and necrosis of hepatopancreas, haemocytic infiltration and fibrosis occur after 3 weeks with gradual mortality upto 98% in 3 months.

PREVENTIVE MEASURES :

It includes use of recently manufactured feeds, storing of feeds in well ventilated and cool rooms, preferably at 10 to 20 °C or lower, preparation of pond bottom properly to reduce organic matter content and reducing line input during pond preparation.

In hatcheries treatment suggested includes a days bath in 1-2 ppm quaternary ammonium compounds and a days bath in 10-20 ppm furazolidone.

BLUE DISEASE

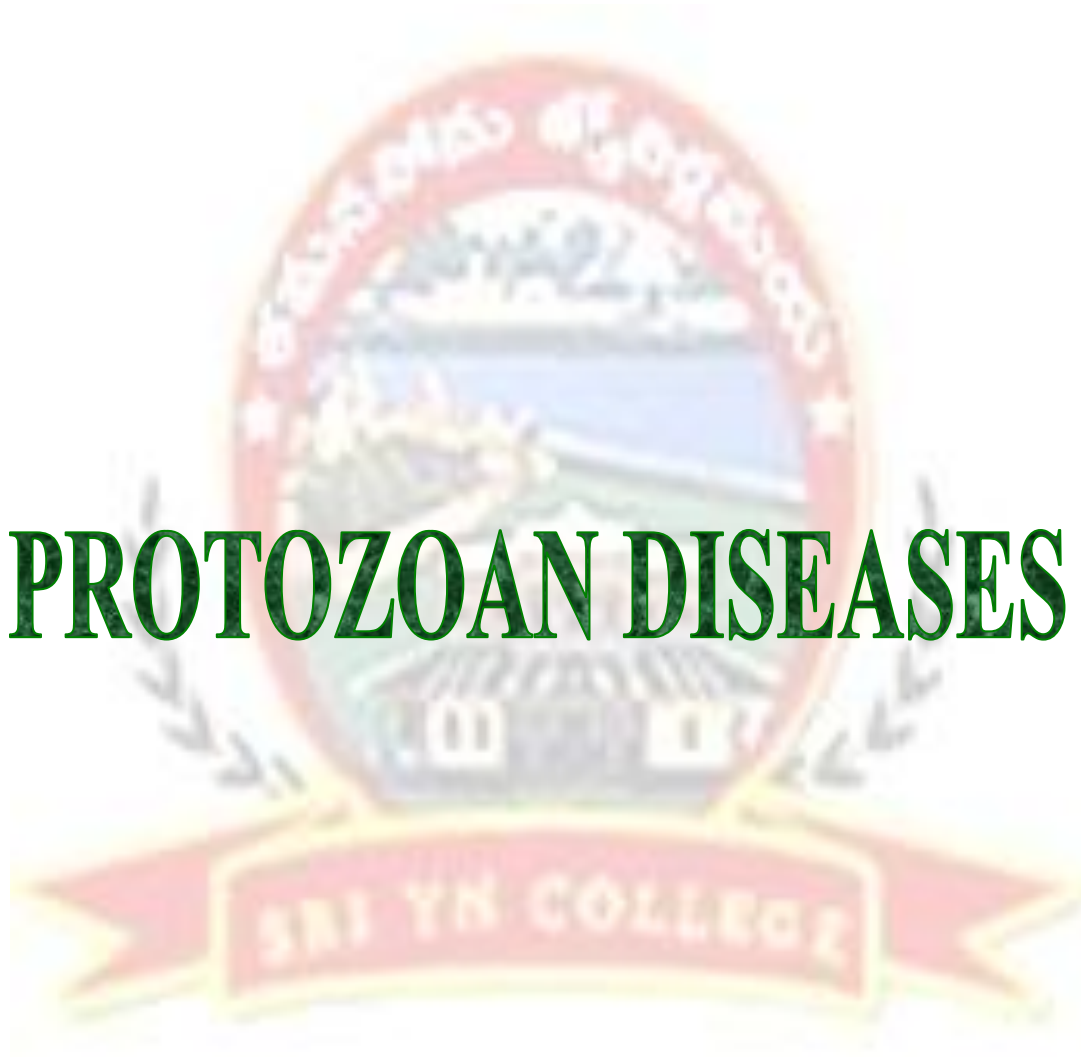
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PREVENTION :

Preventive measures and treatment of the disease include supplementary diet with vitamin-A or carotenoid sources like yellow corn 45 days after stocking changing of 10 to 15% water volume daily to reduce the hydrogen sulphide-rich bottom layers of water, reducing stocking density and providing high quality food.

PROTOZOAN DISEASES



PROTOZOAN DISEASE

It is caused by ecto-commensals such as vorticella, Acineta and ephelota on eggs, larvae, post larva, juveniles and adults. P.Monodon showing fuzzy mat on shell and gills causing reddish to brownish gills.

CAUSES :

The protozoans cause locomotory and respiratory difficulties, when present in large numbers on the appendages and gills with loss of appetite.

High organic load, heavy siltation, turbidity and low oxygen levels be avoided maintaining good water quality.

TREATMENT

In nursery tanks, application of chloroquin diphosphate at 1.1 ppm for 2 days is effective against the ciliates after 3 treatments. “Zoothamnium” infestation in adult can be treated effectively with 50-100 ppm formaline for 30 minutes.

“Epistylis” infestation in juveniles can be eliminated by 30ppm formaline treatment.

CHEMICAL PROPHYLAXIS AGAINST LARVAL MYCOSIS

- 1 20ppm laundry detergent is prepared

Total Volume of Water in litres		Weight in detergent to be added in grams
1	--	0.02
2	--	0.01
3	--	0.2
100	--	2.0
500	--	10.0
1000	--	20.0

- 2 The detergent be dissolved in a small amount of fresh water and added to the egg culture tank mixing gently.
- 3 Allow standing and aerating for 2 hrs
- 4 Eggs be transferred to an egg washer and rinse eggs thoroughly using flow through sea water to remove detergent
- 5 Chemical prophylaxis should be done long before hatching; the eggs should not be allowed to hatch in detergent solution.

WATER QUALITY

Parameter	Range
Temperature	24 – 31
pH	7.5 – 8.5
D.O	>5ppm
Salinity	28.33ppm
Turbidity	<50ftu
BOD	<1.0ppm
Heavy metals	<0.01ppm
Heavy metal	<0.01ppm
Unionized ammonia	<0.1ppm
Nitrite	<0.02ppm

GUIDELINES FOR TREATMENT OF SHRIMP DISEASES

- 1 Rearing facilities be cleaned before treatment. This may be done by siphoning out .
- 2 Sediments from the tank bottom and by water change, organic matter present in dirty
- 3 Tanks could absorb part of the drug being used, thus reducing its effectiveness
- 4 Treatment be made only during the coolest part of the day (night time). The drug used should provide the least environmental hazard or stress.
- 5 Dissolved oxygen level be monitored before and during treatment since stressed shrimps need more oxygen and additional aeration be provided, if necessary.
- 6 Calculation of doses of the drug must be correct unexpected mortalities due to drug over dose may happen
- 7 The recommended protocol be followed strictly as regular use of drugs of levels lower than recommended could result in the development of resistant strains of bacteria. Continued use of the drug of the recommended levels, but beyond the prescribed period of exposure, could result in physical deformities among treated ones.
- 8 Records of all treatment, their propose and results be maintained for future reference.

DISEASE PREVENTION

In order avoid proliferation of pathogens in pond environment certain minimum management steps are to be taken. They are :

- 1) Location of farm where industrial/domestic pollution is less.
- 2) Stock good quality seed and in moderate densities.
- 3) Maintaining good water quality by regularly checking H_2S , NH_3 , pH, DO_2 , etc.
- 4) Feeding with good and fresh feed
- 5) Routine health checks up by examining gills, hepatopancreas and exoskeleton.

Inspite of all the care the disease may occur. Hence we may like to resort to a antibiotic use. While using the antibiotics one has to keep into consideration the

- 1) The possibility of development of resistance to drugs by the microbes, which may cause epidemics to people
- 2) How to administer the drugs to prawns
- 3) Development of residues in the fissures of shrimp, which makes them non-acceptable to human consumption
- 4) Whether the drug has been cleared for use in aquaculture.

CONCLUSION

With all the utmost responsibility of exclusive involvement, We sincerely would like to end up here to conclude and submit our assessment of project assignment under the topic “PRAWN DISEASES” from Aquaculture department to us its an enormous encouragement and support to accomplish our task of exaggeration and inspirational accuracy of playing a vital role of our to persuade the unidentified localities of the world to make them to attain a greater innovative achievement. we here to conclude our project working assignment with lots of blithe and with ritual submission of spirit.

Thanking You



















