EFFECT OF STOCKING DENSITY OF RED HYBRID TILAPIA (*OREOCHROMIS* SP.) ON GROWTH AND SURVIVAL OF JUVENILE TILAPIA AND SHRIMP (*LITOPENAEUS VANNAMEI*) IN POLYCULTURE.

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Alejandro Macdonald-Vera who completed the study.

Shrimp ponds in Mexico.

- Shrimp Farming Industry in Mexico.
  - Industry is prospering.
  - Disease and pricing problems.
  - Inefficient farms stop operating.
  - Over 5000 ha of shrimp ponds unused.
- Shrimp-Tilapia polyculture.
  - Increased production.
  - Maintain or improve shrimp survival.
  - Remove disease carriers from system.

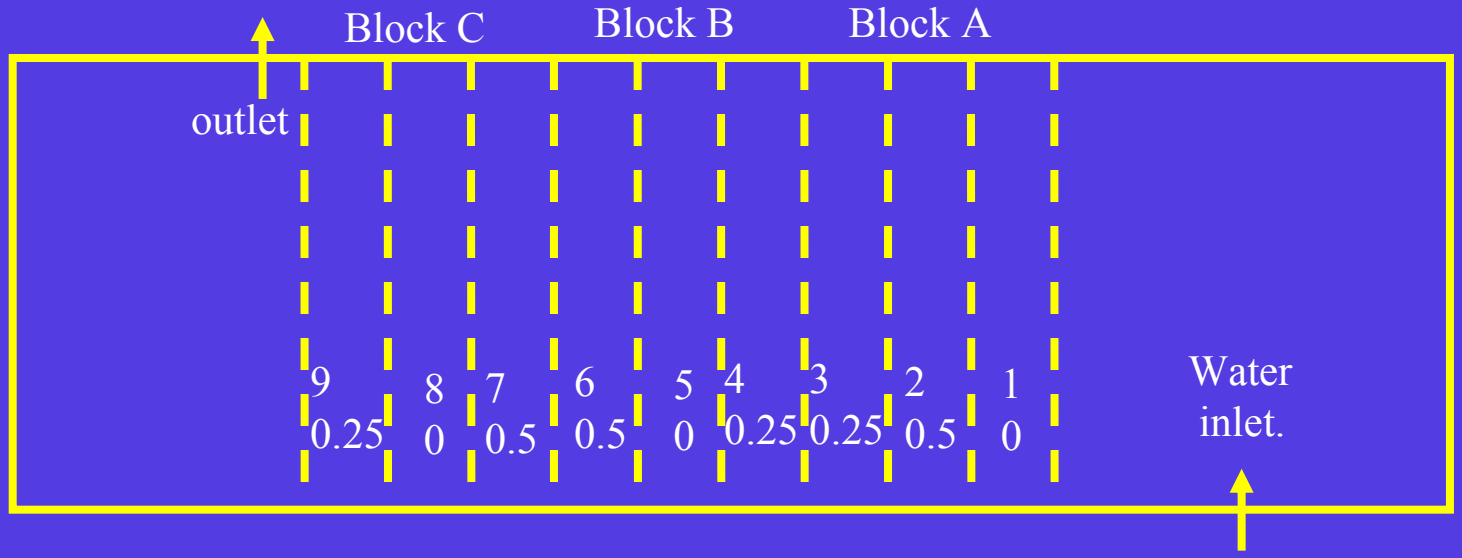
Methods

Pond preparation, ploughed and limed.

Mosquito mesh divisions to make experimental enclosures

- White shrimp – PL 16 - 0.004g
  - *Litopenaeus vannamei*
  - Certified free from white spot
- Red hybrid tilapia - 4.6±0.9g
  - Genetic component of *Oreochromis mossambicus*
  - All males (hormonal treatment)
  - Acclimatised to 35ppt sea water, 5ppt per day.
- Pond preparation.
  - Salinity range - 28 to 35 ppt
  - Temperature range - 16.2 to 25.6°C

Methods experimental design



Experimental pond set up.

- 9 enclosures (7x30=210m^2) in 3 blocks, A, B, C.
- All enclosures stocked with 30 shrimp/m^2
- Tilapia stocked at 3 densities, 0, 0.25, 0.5 fish/m^2 to give the experimental groups T0, T0.25 and T0.5

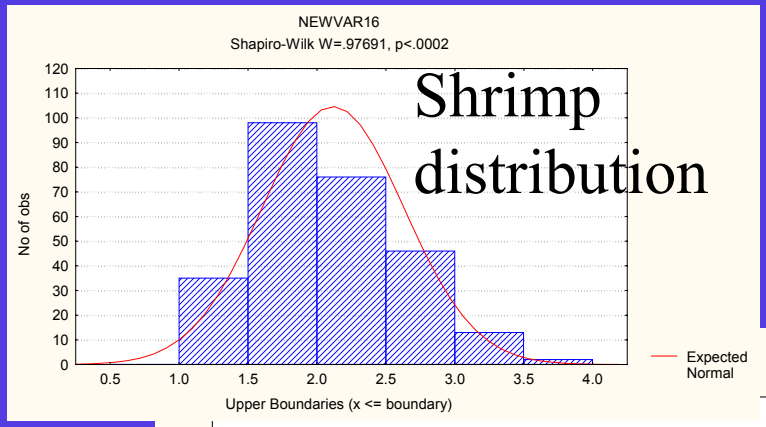
Methods

Stocking.

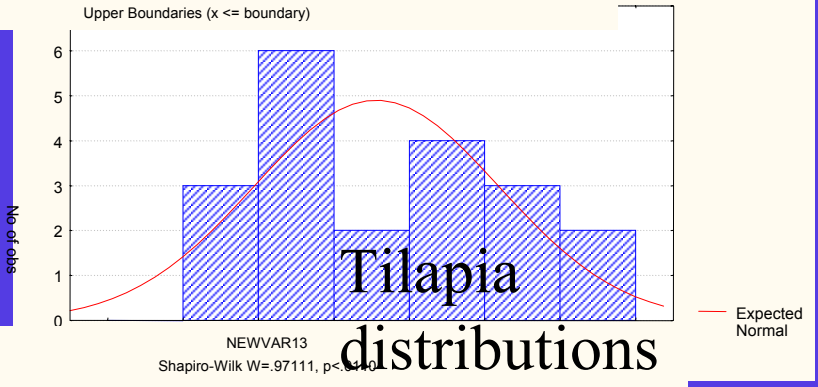
Sampling.

- Stocking
  - Shrimp and tilapia were acclimatised and randomly stocked into each enclosure.
- Sampling.
  - Every 2 weeks.
  - 20 tilapia caught and weighed.
  - 30 shrimp weighed.
- Harvest.
  - Experiment lasted for 8 weeks.
  - All shrimp and tilapia were harvested, counted and a random sample weighed.

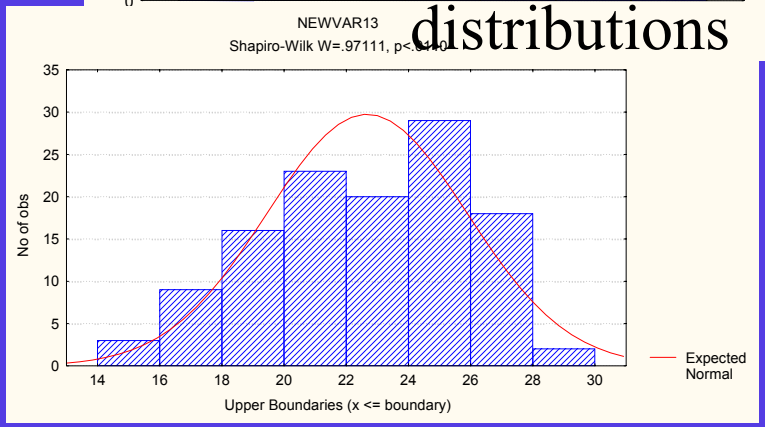
Results - Statistics



Shrimp distribution

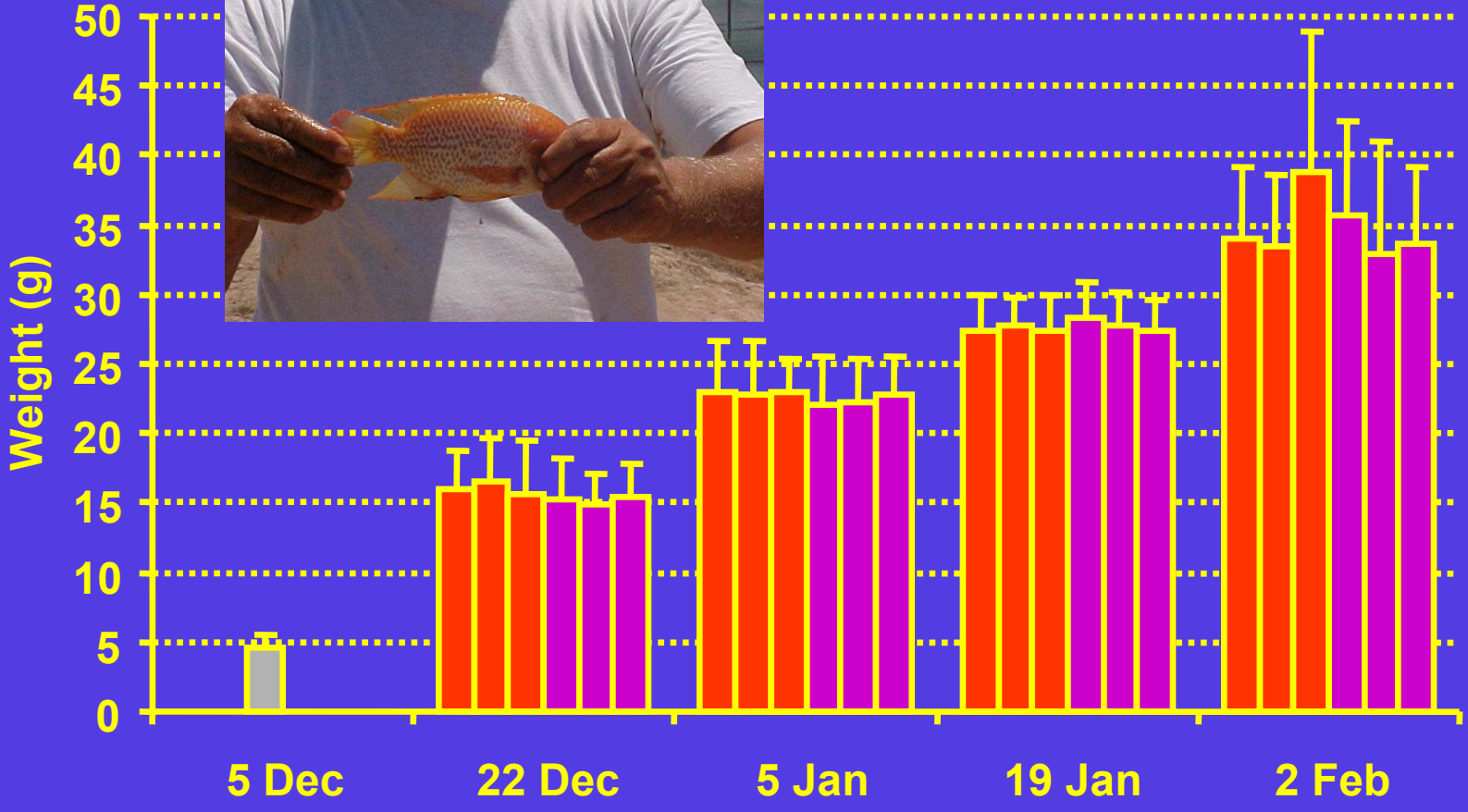


Tilapia distributions



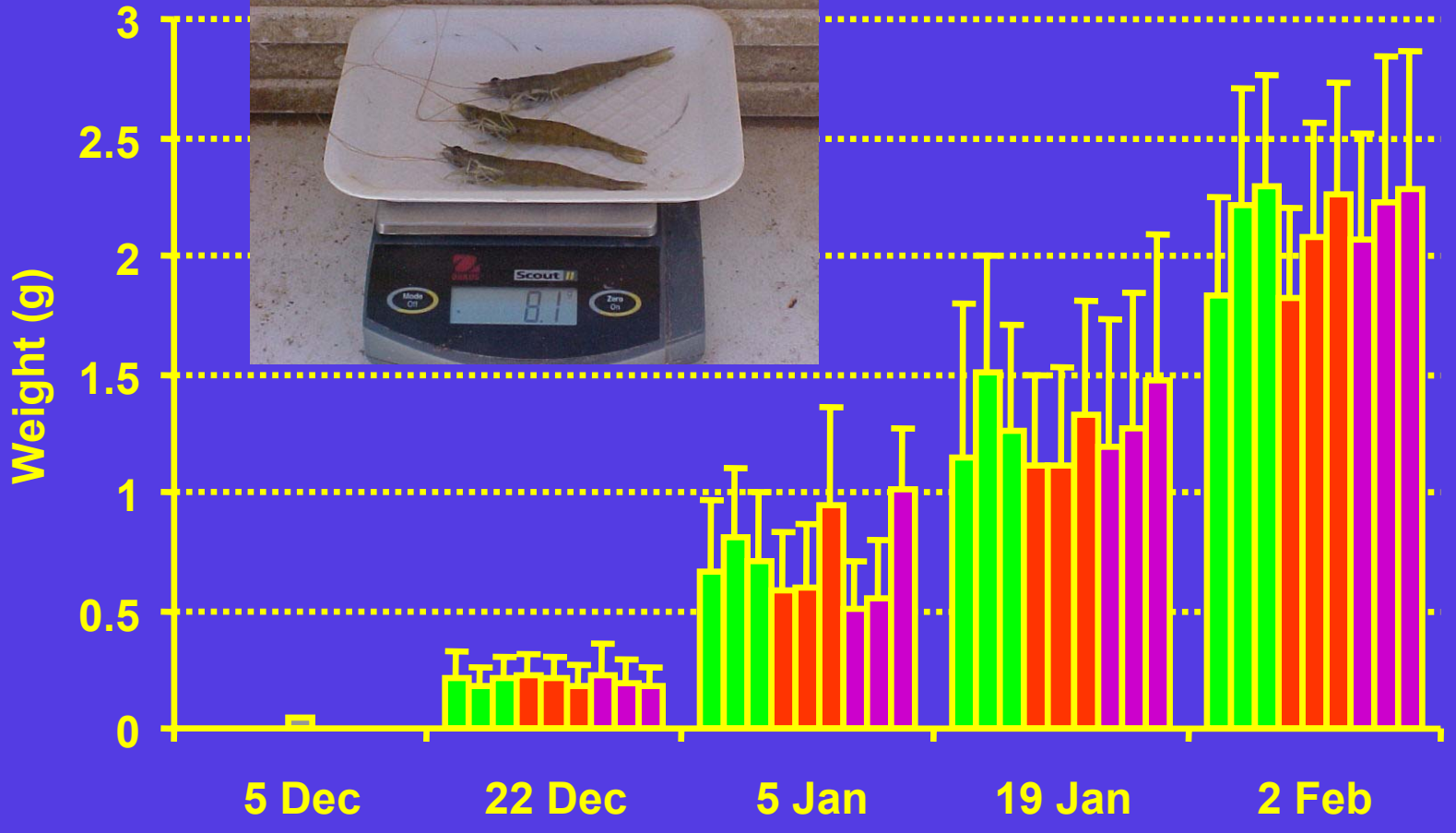
- Weight data was not normal.
  - Some shrimp weight distributions were highly skewed towards larger individuals.
  - Some tilapia weight distributions had characteristics of a bimodal distribution, 23 to 42% maturing females were found during the harvest.
- 2 way Scheirer-Ray-Hare extension of the Kruskal-Wallis and the DUNNS test were used to compare weight distributions
- Survival distributions were normally distributed and were compared with ANOVA.

Results – Tilapia Growth.



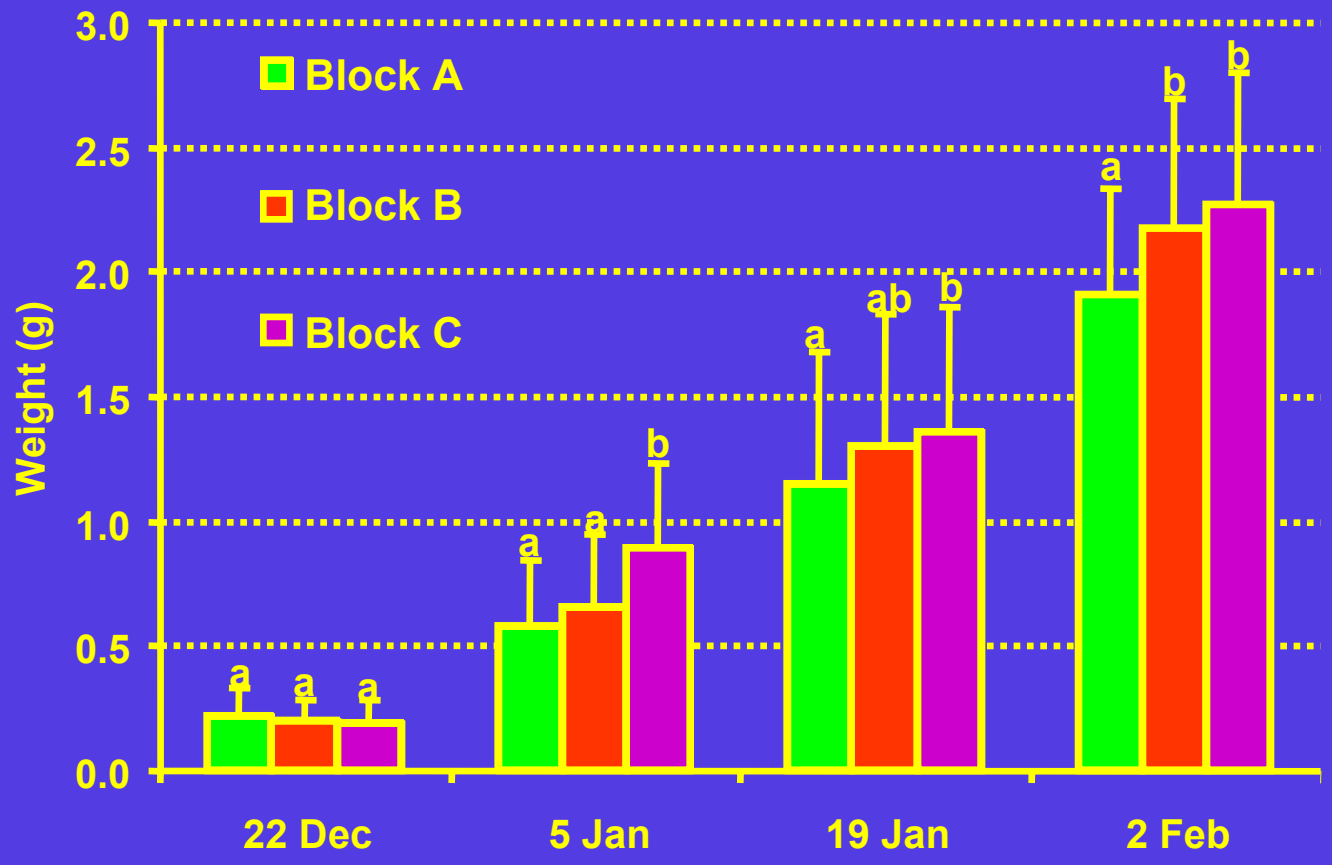
No significant differences were observed for tilapia weights among treatments T0.25 and T0.5 or blocks A, B and C.

Results – Shrimp Growth.



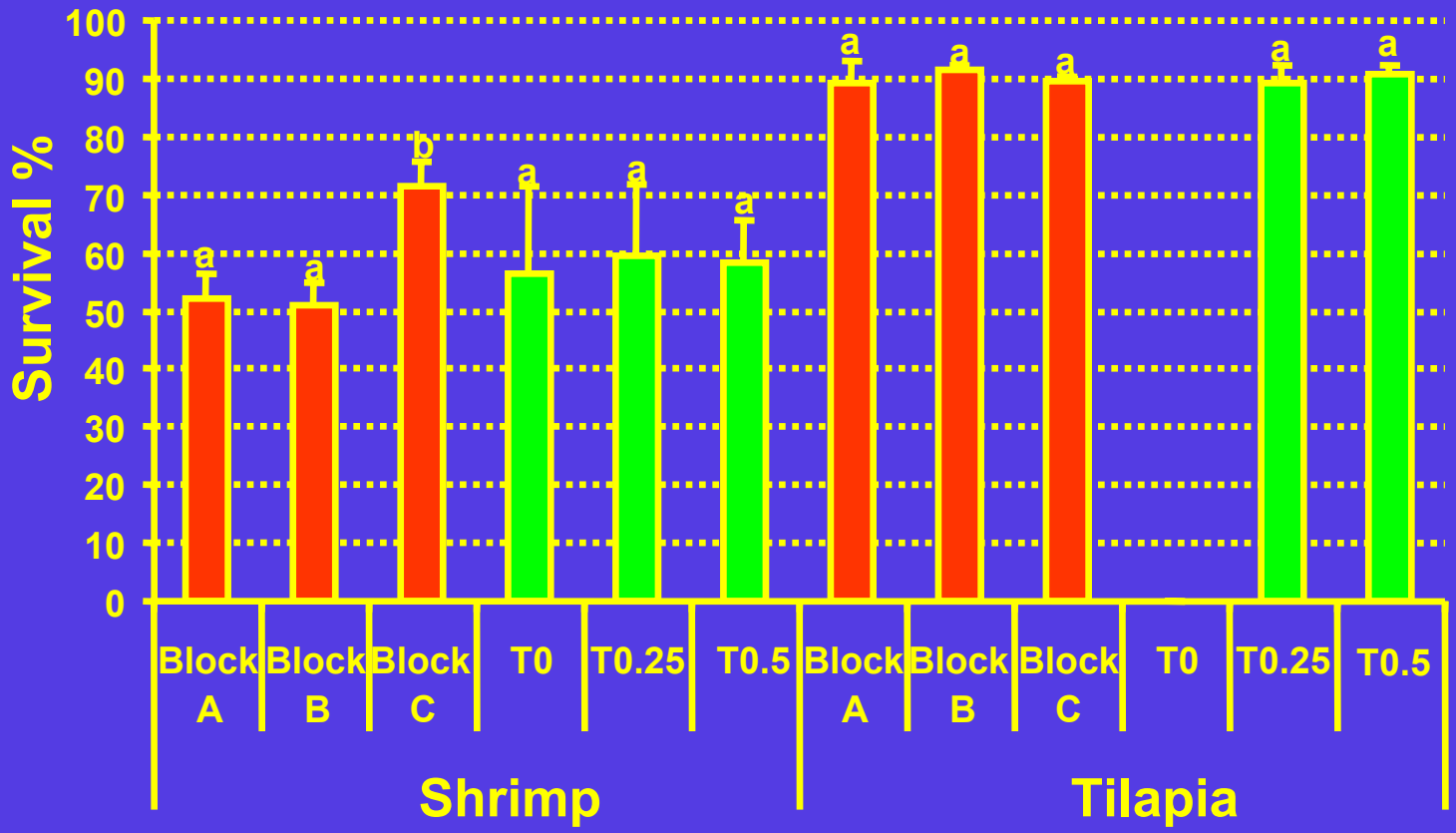
No significant differences were observed among treatments T0, T0.25 and T0.5

Results – Shrimp Growth.



Significant differences ($P<0.05$) were observed among blocks A, B and C.

Results – Survival.



There were no significant differences among tilapia survivals. There were no significant differences among shrimp survivals for treatments, T0, T0.25 and T0.5. There were significant differences ($p<0.05$) among shrimp survivals for blocks A, B and C.

Conclusions

- Stocking densities of 0, 0.25 and 0.5 fish/m^2 did not significantly affect growth or survival of juvenile shrimp and tilapia.

- Block or position in the pond did significantly affect ($p<0.05$) growth and survival of juvenile shrimp.

- These are encouraging results that suggest shrimp tilapia poly-culture has good potential for diversifying the Mexican shrimp culture industry and rehabilitating disused shrimp ponds.

Gracias CRSP

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