

# Uptake of Natural Food and Supplemental Feed by Cultured Nile Tilapia, *Oreochromis niloticus* (L.), in Laguna de Bay, Philippines



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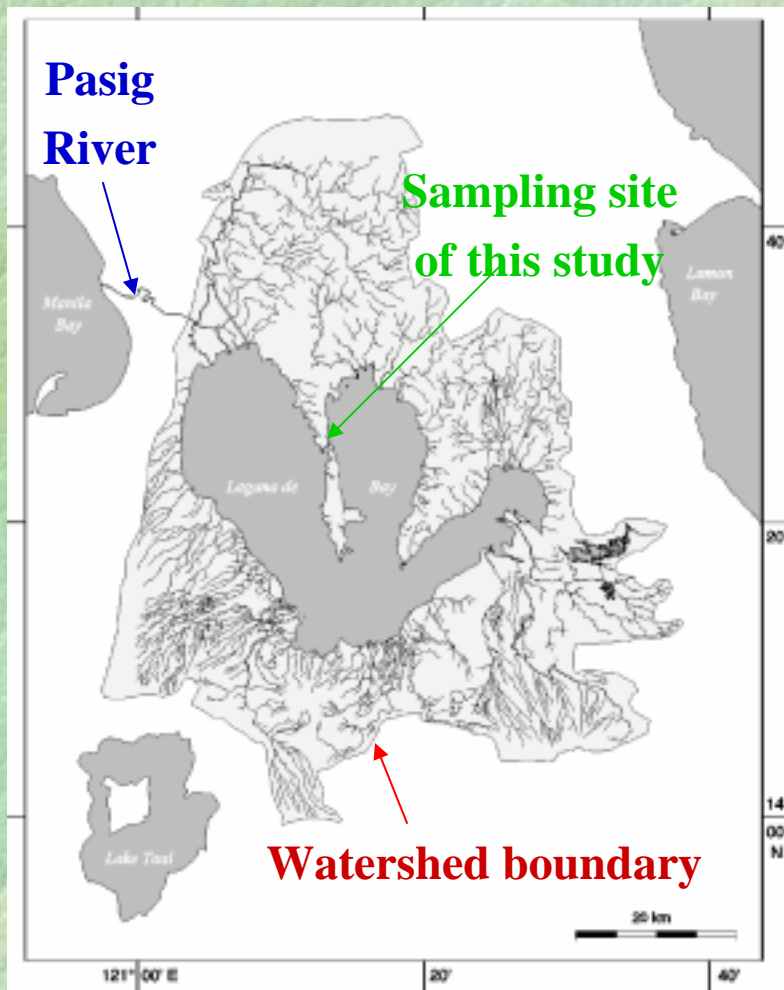
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# Laguna de Bay (Physical properties)



- 911km<sup>2</sup> but only 3m deep on average
- 22 inflows but only one outflow (Pasig River)
- Annual temperature 25-31°C
- Dissolved oxygen high due to wind mixing
- Water normally turbid (Secchi depth <30cm) due to resuspension of silty lake sediment

# Laguna de Bay from the air



Water normally very turbid.....



....due to erosion in the watershed



# Settlements confined to shoreline



Culture setups regularly destroyed  
by typhoons every few years



Aquaculture started in 1970 in large netpens (milkfish)...





...and later included small cage culture (tilapia and chinese carps)



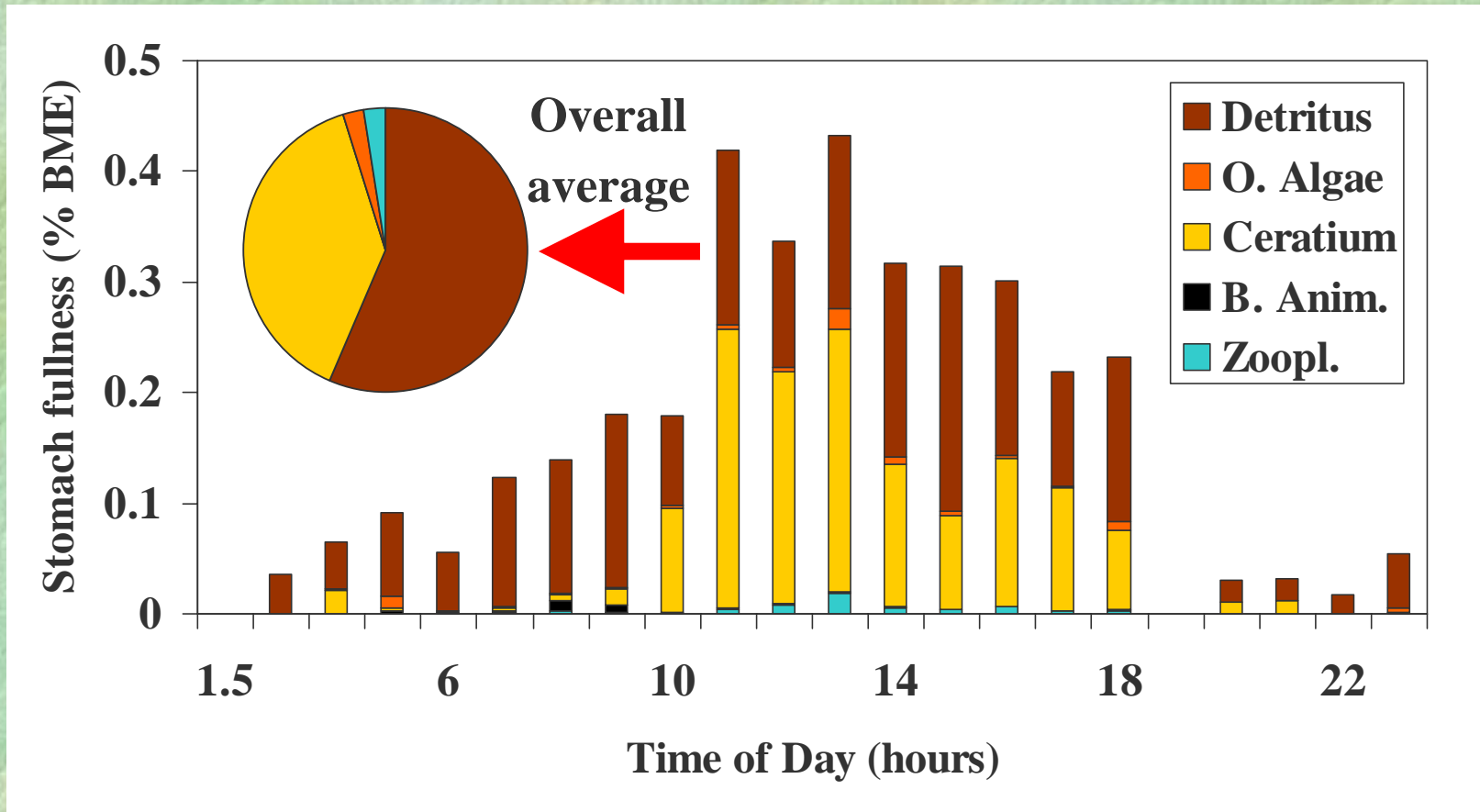
# Materials & Methods

- Five trials 1996-97, each on one fish cage
- Five fish sampled per hour over 24 hours (N=120)
- Stomach content composition quantified by visual estimation of slide coverage under microscope
- Daily rations calculated with fish feeding model MAXIMS (dry weight basis)

# Results (1) - Fish body data

| Date                                     | St. Lengths<br>(cm) | Total Weights<br>(g) |
|--|---------------------|----------------------|
| 19. March 1996                           | 10.0                | 41.0                 |
| 16. May 1996                             | 9.1                 | 30.5                 |
| 17. July 1996                            | 9.0                 | 32.5                 |
| 26. September 1996<br>with feed (8% BME) | 8.4                 | 25.1                 |
| no feed                                  | 8.6                 | 25.3                 |
| 14. January 1997<br>with feed (excess)   | 7.5                 | 15.4                 |
| no feed                                  | 7.5                 | 14.8                 |

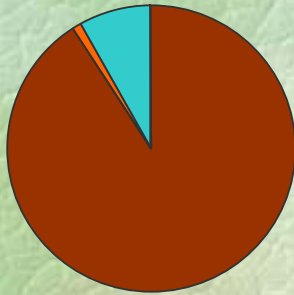
# Results (2) - Diet Composition Analysis



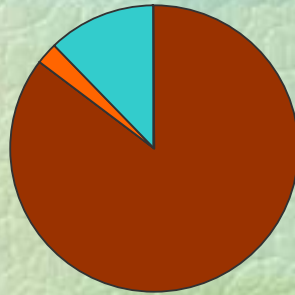
Data for July 1996

# Results (3) - Diet Composition

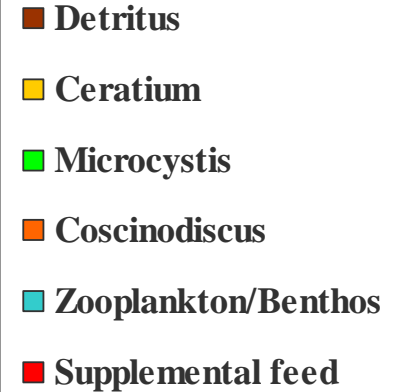
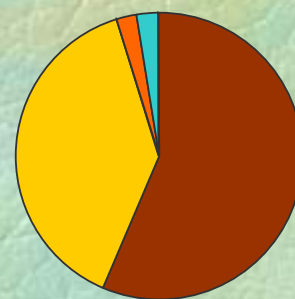
**March 1996**



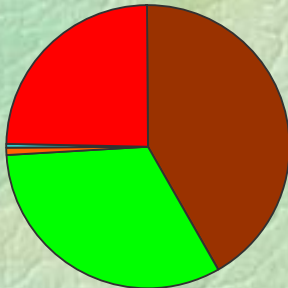
**May 1996**



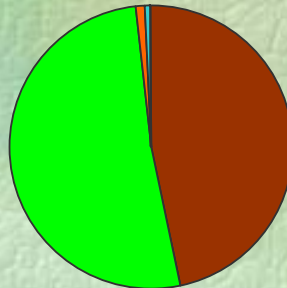
**July 1996**



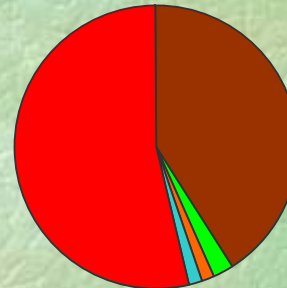
**Sept. 1996**  
**SF**



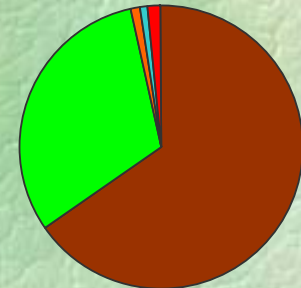
**Sept. 1996**  
**NF**



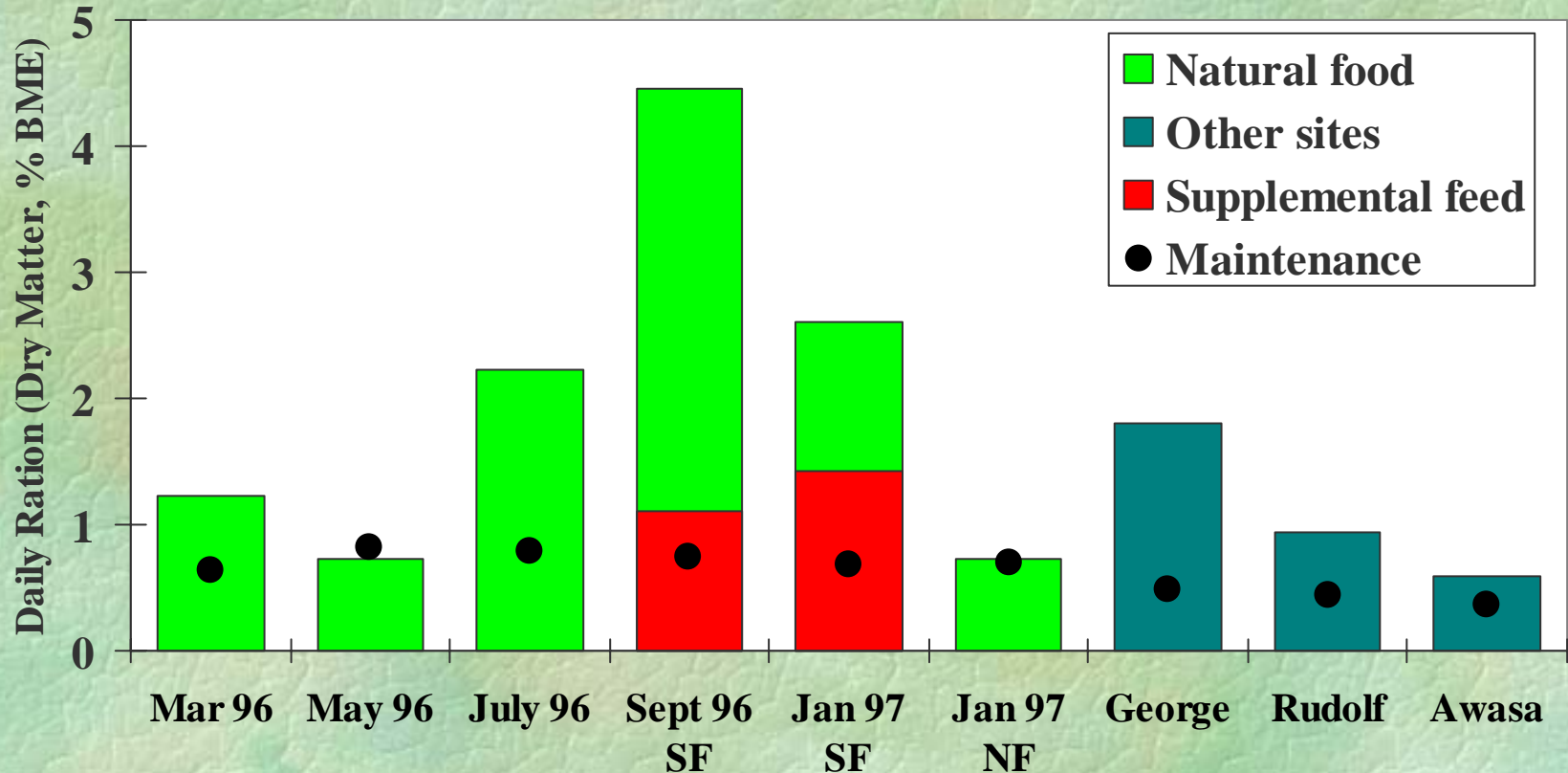
**Jan. 1997**  
**SF**



**Jan. 1997**  
**NF**



# Results (4) - consumption compared to maintenance & other localities



SF: supplemental feed given, NF: no feed

(Maintenance calculated from Richter et al., 2002, Aquacult. Int. 10: 1-9)

# Conclusions

- Food quality is a major limiting factor for unsupplemented fish
- Large amounts of supplemental feed are wasted, probably contributing to detritus
- When algal bloom occurs, supplemental feed not necessary

# Recommendations

- If supplementation must continue:
  - cut feed losses (less feed in more daily doses, use solid-bottomed cages)
  - investigate possibility of culturing more profitable species
- **Investigate sources of detritus, cut down on input and revert to extensive aquaculture**



# **Thank you!**

**(You may now wake up again!)**

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**Full version of thesis can be downloaded at**

**[http://opus-ho.uni-stuttgart.de/hop/  
volltexte/2003/35/index.html](http://opus-ho.uni-stuttgart.de/hop/volltexte/2003/35/index.html)**