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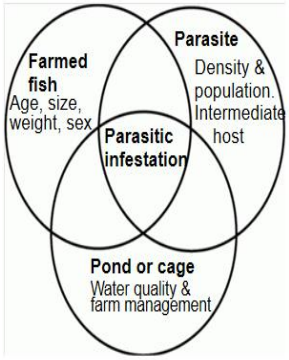
NARO

WORLD AQUACULTURE SINGAPORE 2026

COMPARATIVE STUDY OF THE OCCURRENCE AND DISTRIBUTION OF PARASITES IN POND AND CAGE-CULTURED NILE TILAPIA *Oreochromis niloticus* IN THE LAKE VICTORIA CRESCENT, UGANDA

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Background



- Despite biosecurity & control efforts, parasite burden has increased in the Crescent
- Notably, different culture systems provide different habitats & environmental conditions for parasites.
- Understanding these dynamics may provide better management strategies

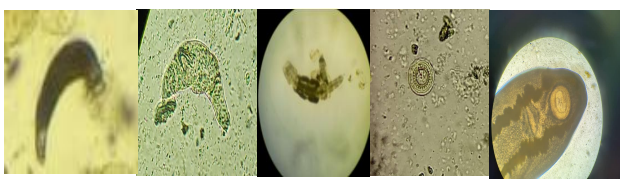
Materials and methods

- 18 Pond, 9 Cage (lake), 2 Cage grow-out (reservoir) & 3 Hatchery farms visited
- 640 *Nile tilapia* examined for ectoparasites & endoparasites
- Water quality → *VuSitu digital testing kit & Fresh Aquaculture Kit AQ-2.*
- Farm management → *Direct observation, questionnaires*

Statistical analysis

- Differences in P, Mi & Ma among the four culture systems (Pond; Cage (lake); Cage grow-out (reservoir); Hatchery) → *Kruskal-Wallis test*
- Relationship between parasitic infection and infestation & farm management practices → *GLM with zero-inflated Poisson or negative zero-inflated negative binomial distribution.*

Results and discussion



Gyrodactylus;Cichlidogyrus; Ergasilus;Trichodina; Clinostomum

Composition, infestation & infection of parasites

- 15 parasite genera; 6 protozoans, 2 monogeneans, 2 digeneans, 1 crustaceans, 3 cestode, & 1 acanthocephalan.
- Pond & Hatchery → 11 genera, Cage (lake) & Cage (reservoir) → ≤ 5 genera
- *Trichodina* & *Cichlidogyrus* spp in all systems
- *Trichodina* spp. → most prevalent & abundant)
- *Cichlidogyrus, Myxobolus & Ichthyobodo spp* in pond system → Zero-inflated Poisson distribution
- Other genera → Zero-inflated negative binomial distribution in both pond (80%) and cage (100%)

Parasite genera	Frequency distribution		Significant farm management practices associated with parasite abundance and the IRR (CI)	
	Pond culture systems (N=21) -Pond grow-out (n=18) -Hatchery (n=3)	Cage culture system (N=11) -Cage grow-out (lake) (n=9) -Cage grow-out (reservoir) (n=2)	Pond culture systems (N=21) -Pond grow-out (n=18) -Hatchery (n=3)	Cage culture system (N=11) -Cage grow-out (lake) (n=9) -Cage grow-out (reservoir) (n=2)
Trichodina	Zero-inflated negative binomial	Zero-inflated negative binomial	Fish seed source2, IRR = 0.41 (0.26-0.64), *P* = 8.44e-05	Stocking density2, IRR = 26.91 (8.47-85.50), *P* = 2.37e-08 Feeding and nutrition status4, IRR = 5.91 (1.86-18.82), *P* = 0.00262 Feeding and nutrition status5, IRR = 3.81 (1.20-12.14), *P*= 0.02370
Cichlidogyrus	Zero-inflated Poisson	Zero-inflated negative binomial	Stocking.density2, IRR = 2.24 (1.38 - 3.23), *P* = 0.000706 Feeding and nutrition status4, IRR = 2.05 (1.04-4.23), *P* = 0.037513	Stocking density2, IRR = 0.26 (0.12-0.53), *P* = 0.000214 Control of Wild fish entry1, IRR = 4.56 (2.05-10.15), *P* = 0.000207

Relationship between parasitic infection and infestation & farm management practices

- In pond systems, adequate stocking density & feeding associated with increase in *Cichlidogyrus* spp. abundance while sourcing of seed source associated with decrease in Trichodina spp abundance.
- For cage system, adequate stocking density & feeding associated with increase in *Trichodina* spp. abundance. This highlights the interaction of seasonality and farm management in the control of parasites.
- Wild fish entry associated with increase in *Cichlidogyrus* spp. abundance while optimal stocking density associated with decrease in *Cichlidogyrus* spp. abundance