FRESHWATER SYSTEMS · FISH HEALTH

Small Pelagic Fishery and Parasite Load in Lake Victoria

Assessing infection by Ligula intestinalis in the omena (Rastrineobola argentea) by-catch of the Winam Gulf, and its consequences for fish condition and reproduction.

REFERENCE	ISSUED	REGION
C82_4(2)	**June 2026**	**Dunga Beach, Winam Gulf**

FRESHWATER SYSTEMS

99
omena specimens examined for parasites

5%
overall infection prevalence

60%
drop in fecundity in infected females (1000 to 400 eggs)

35 mm
size above which most infections occurred

Background

Lake Victoria is Africa's largest freshwater lake and supports one of the most productive inland fisheries in the world, providing food, income, employment and transport to millions of people. The Kenyan section, particularly the Winam Gulf, faces growing ecological stress from eutrophication, pollution and urban runoff. Among the commercially important species is *Rastrineobola argentea* (omena), a small pelagic fish of major ecological and economic value that is also taken as by-catch in gillnet fisheries targeting Nile perch and Nile tilapia.

Omena is frequently infected by the tapeworm *Ligula intestinalis*, which impairs growth, reproduction, behaviour and survival. Understanding the occurrence of this parasite and its effects on fish populations is therefore important for fisheries management and for the conservation of the lake's ecosystem.

> **Objective:** to assess the length-weight relationship, length-frequency distribution, fecundity and Ligula intestinalis parasite load of omena taken as gillnet by-catch at Dunga, the innermost gulf sampling site.

Methods

Ninety-nine omena specimens were obtained from artisanal gillnet by-catch landings at Dunga Beach and transported to the laboratory for examination. Each fish was dissected to detect *Ligula intestinalis* in the body cavity, and biological parameters were recorded, including fish length and weight, sex, gonad condition, and parasite length and weight. Parasite prevalence and intensity were calculated using standard parasitological procedures, alongside length-weight, length-frequency and fecundity analyses.

Key Findings

Low prevalence, but a heavy reproductive cost

Of the 99 fish examined (42 males and 57 females), five were infected, giving an overall prevalence of 5%. The parasites were elongate and ribbon-like and lodged in the abdominal cavity, and most infected fish came from gillnet by-catch landings. Infected fish showed swollen abdomens, reduced body condition, lower

reproductive potential and altered swimming behaviour. Healthy females recorded fecundity values of up to about 1,000 eggs, whereas infected females recorded approximately 400, a clear reduction in reproductive performance.

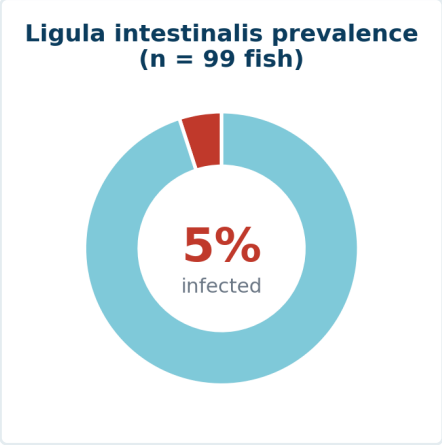


Figure 1. Overall Ligula intestinalis prevalence was 5% across the 99 specimens examined.

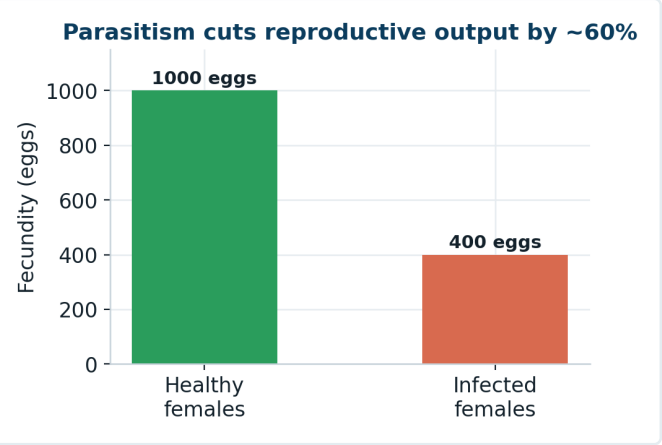


Figure 2. Healthy females carried up to about 1,000 eggs versus about 400 in infected females, a marked loss of reproductive output.

Larger fish are more often infected

Most infected fish exceeded 35 mm in length, while smaller fish were generally uninfected. This is consistent with larger fish consuming more copepods, the intermediate hosts of the parasite. Infected fish were frequently observed swimming near the surface, increasing their vulnerability to predatory birds that complete the parasite's life cycle. The study also suggests that environmental stress, eutrophication and changing conditions in the Winam Gulf may influence transmission dynamics.

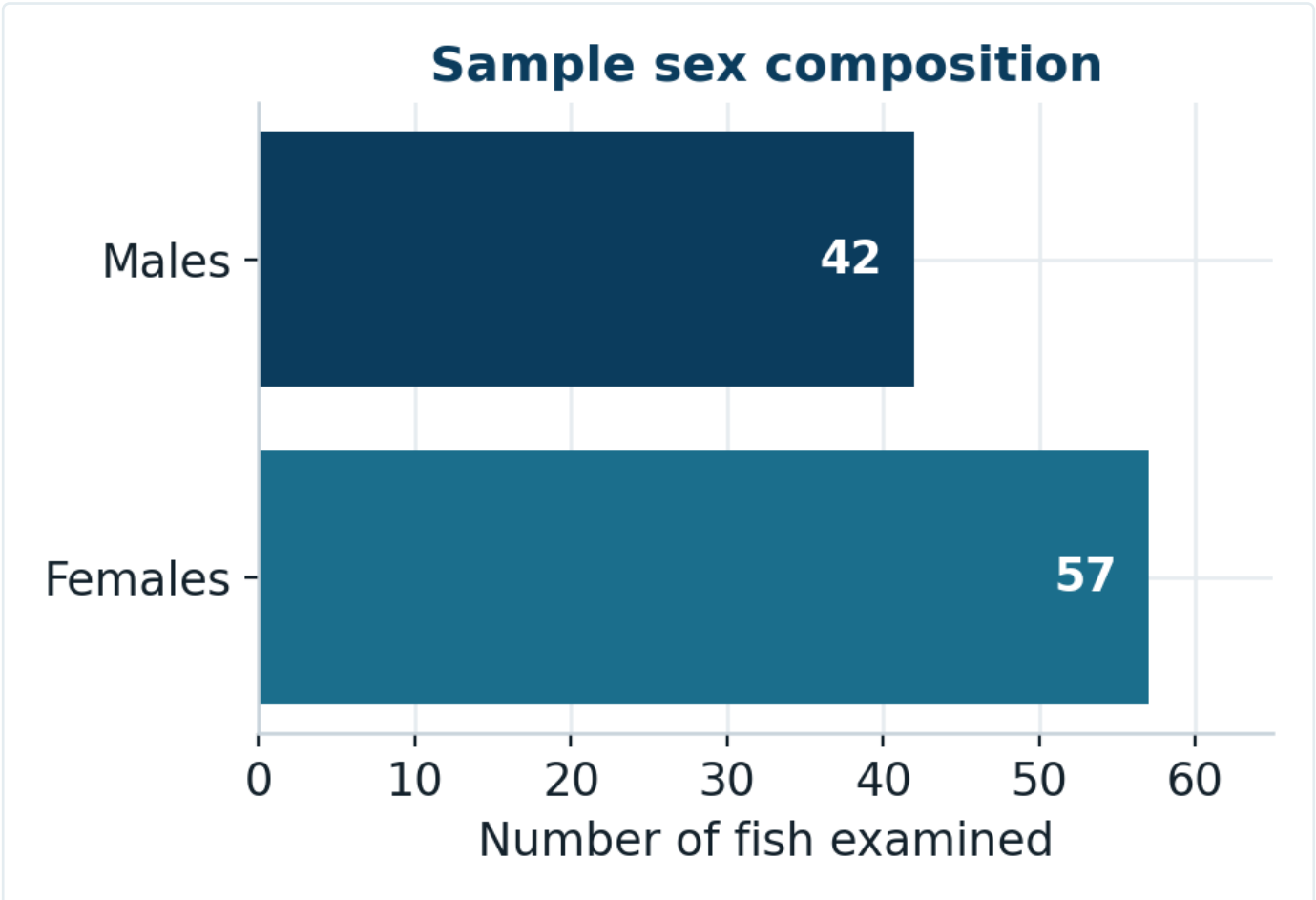


Figure 3. Sex composition of the examined sample (57 females and 42 males).

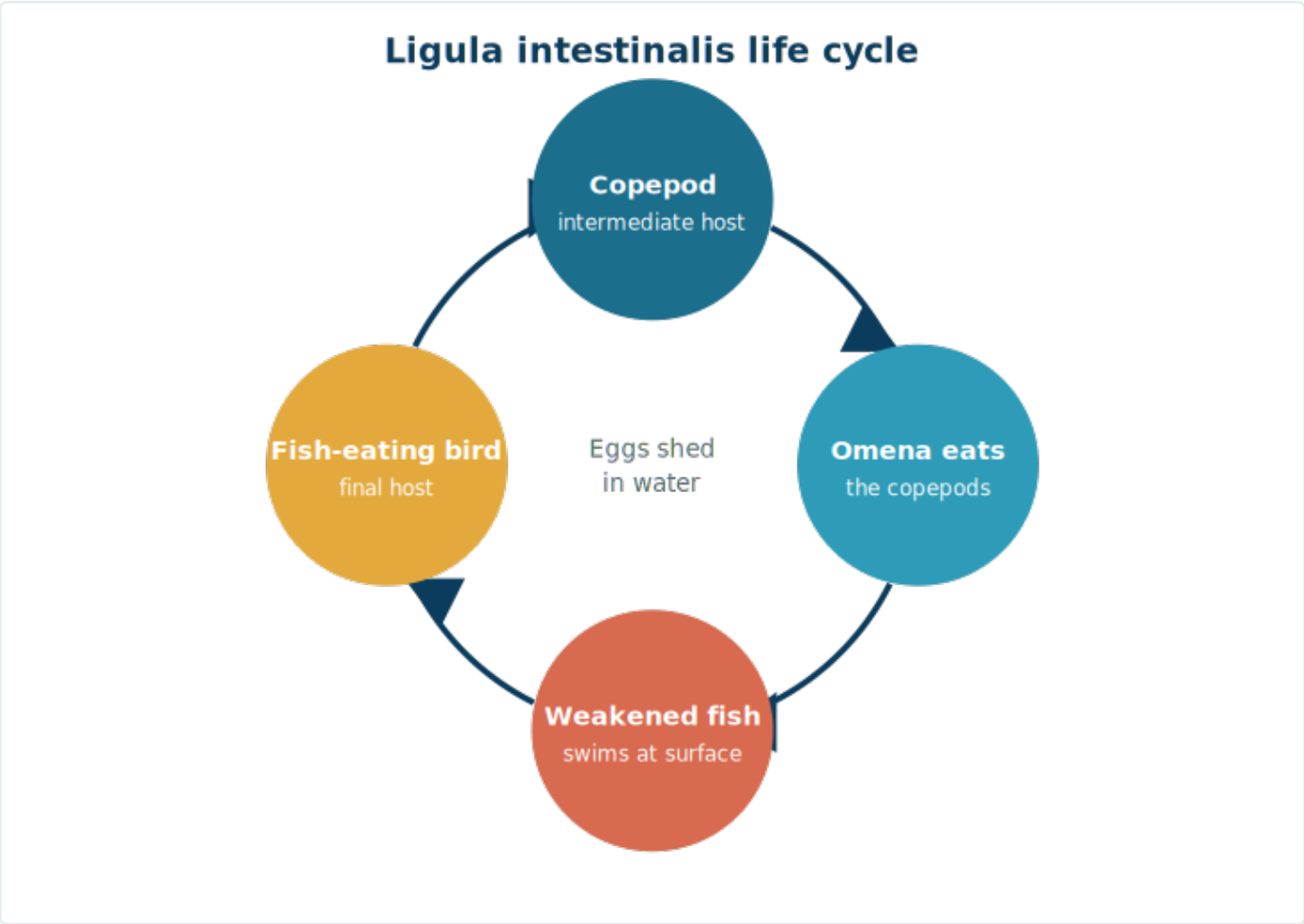


Figure 4. Transmission pathway of *Ligula intestinalis*: copepods are eaten by omena, infected fish weaken and rise to the surface, and fish-eating birds complete the cycle by shedding eggs back into the water.

Conclusions

- Although prevalence is currently low (5%), infection substantially reduces fecundity and body condition, with implications for recruitment.
- Infection is size-dependent, concentrated in larger fish, and tied to the copepod, fish and bird life cycle of the parasite.
- Eutrophication and environmental change in the Winam Gulf may alter transmission dynamics and warrant monitoring.

Recommendations

1. Incorporate routine fish-parasite and fish-health monitoring into Lake Victoria fisheries management programmes.
2. Strengthen efforts to reduce pollution, eutrophication and urban runoff in the Winam Gulf.
3. Integrate fish-health assessments into ecosystem-based fisheries management.
4. Support further research into seasonal parasite dynamics, environmental drivers and alternative transmission pathways.
5. Sensitise fishers and communities on the importance of fish health and environmental conservation.

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