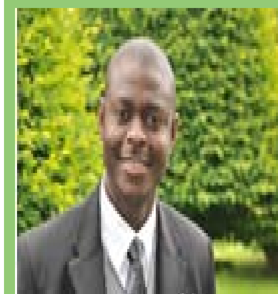
## Conclusion

The grazing potential of invertebrate species on epiphyton biomass with regards to submerged vegetation, varied from species to species.

Invertebrate grazing rates on epiphyton compared to the rate at which they fed on dead leaf alternative food differed significantly from species to species.

These facts were strongly supported by data obtained from this study.

**Acknowledgement**: My sincere gratitude to Anders Hargeby (my supervisor) who conceived the research idea and guided me through a successful research training under his careful supervision.



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# What is the functional role of plant-associated invertebrate diversity in submerged vegetation?

*Lymnaea columella*

*Asellus aquaticus*

*Gammarus pulex*

**By: John Onita**
**Supervisor: Anders Hargeby**

**Background:** Several studies have reported the fundamental importance of invertebrate species living in submerged vegetation in lakes in maintaining the health of these vegetations, but one thing that is not yet clear enough is, understanding the difference in the degree to which each plant associated macro invertebrate species play key roles in regulating the dynamics of micro algal biomass in fresh water vegetations.

**Hypothesis:** Mesograzer species under controlled laboratory conditions, will consume epiphyton biomass at the same grazing rates. Mesograzer species feeding rates on epiphyton biomass is proportional to the rate of feeding on dead leaves

**Methods:** *Lymneae columella; Asellus aquaticus and Gammarus pulex* used as representatives of invertebrate diversity to test study hypotheses. Sampling of test species at Lake Tåkern.
Epiphyton cultured in laboratory.Test organisms fed dead leaves in laboratory. Test organisms fed cultured epiphyton in laboratory.

**Data Analysis:**
F = [F.sub.1] ([F.sub.2] [+ or -] C) Where:
F = actual food consumption in each treatment
[F.sub.1] = amount of food offered
[F.sub.2] = remaining amount of food at the end of trials. C = change in control amount of food without grazer species.
One Way ANOVA

# Results

Invertebrate grazing potential on epiphyton biomass was calculated as a *function* of 3 parameters of measurement; *Actual food consumption (F); Food consumption at varying density (FC);* and *Weight-specific consumption (WSC);* while feeding effects on dead leaf alternative food source was calculated as a *function* of one parameter of measurement; *Consumption rate (CR).* A one-way analysis of variance (ANOVA) followed by a Tukey HSD Post Hoc test indicated highly significant differences among the three invertebrate species' abilities to graze on epiphyton biomass (figs. 1-3) and feed on dead leaf alternative food source (fig 4). Analysis of all 4 parameters of measurement showed significant effect of each species on both epiphyton and dead leaf biomass at P<0.0001 as food consumption among species increased with an increase in species density

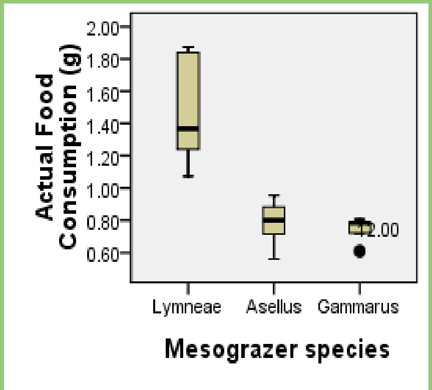


Figure I. Effects of invertebrate grazing on epiphyton biomass during a 4-day feeding trial (P<0.0001).

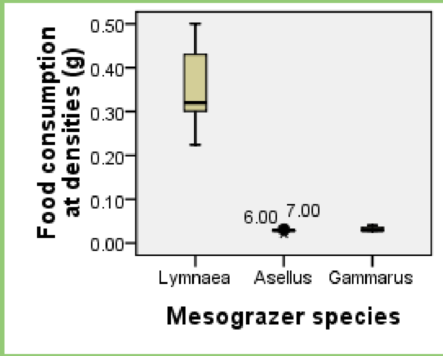


Figure 2 a. Effects of invertebrate grazing on epiphyton biomass at ***high density*** population during a 4-day feeding trial (P<0.0001).

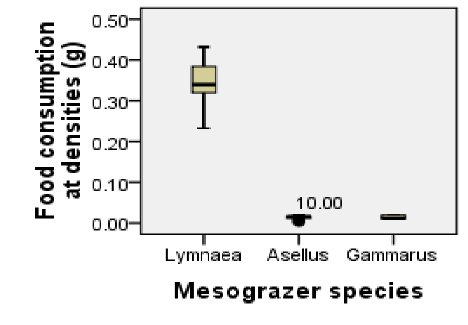


Figure 2 b. Effects of invertebrate grazing on epiphyton biomass at ***low density*** population during a 4-day feeding trial (P<0.0001).

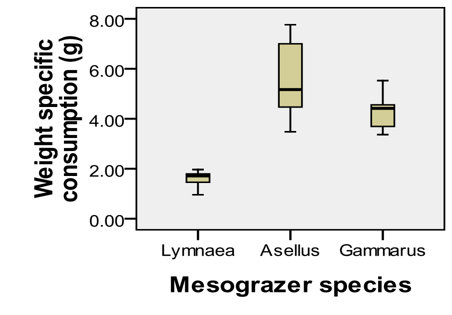


Figure 3. Effects of invertebrate grazing on epiphyton biomass during a 4-day feeding trial (P<0.0001).

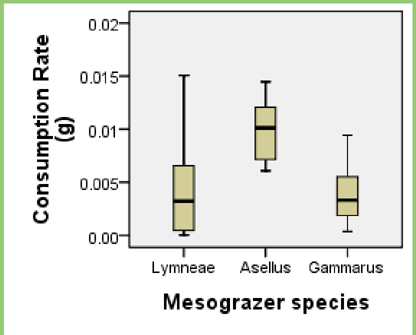


Figure 4. Effects of invertebrate feeding on ***dead leaves*** as alternative food source during a 3-day trial (P<0.0001).