

Apocyclops panamensis as live feed for Sander lucioperca larviculture

Laura Ballesteros-Redondo*, Harry W. Palm, Lukas Reiche and Adrian A. Bischoff

Introduction

- **Larviculture** is an important **bottleneck** in aquaculture.
- High mortality rates, variability in larval quality and quantity result in **unstable production**.
- **Live feed** use in larviculture is a solution to achieve higher survival and growth rates.
- *Artemia* sp. and *Brachionus* have been used in pikeperch (*Sander lucioperca*) larviculture (Policar et al. 2019).
- **Copepods** as a live feed alternative (Ajiboye et al. 2010).



Methods

- We analysed daily the **stomach contents**, survival rate and growth rate 3- 7 dph

Diet	Live feed organism	Amount of live feed*fish ⁻¹ *day ⁻¹	Larval stocking density
Bra-17	<i>Brachionus plicatilis</i>	340	50 larvae*l ⁻¹
Bra-34			100 larvae*l ⁻¹
Apo-17	<i>Apocyclops panamensis</i>		50 larvae*l ⁻¹
Apo-34			100 larvae*l ⁻¹

Results

- The highest **survival rate** was 56% in diet Bra-17 and Bra-34 and lower in Apo-17 (32%) and Apo-34 (50%) (Figure 1). No significant differences were found (ANOVA, p=0.07). **Growth** did not showed any significant difference between the diets (ANOVA, p=0.411).

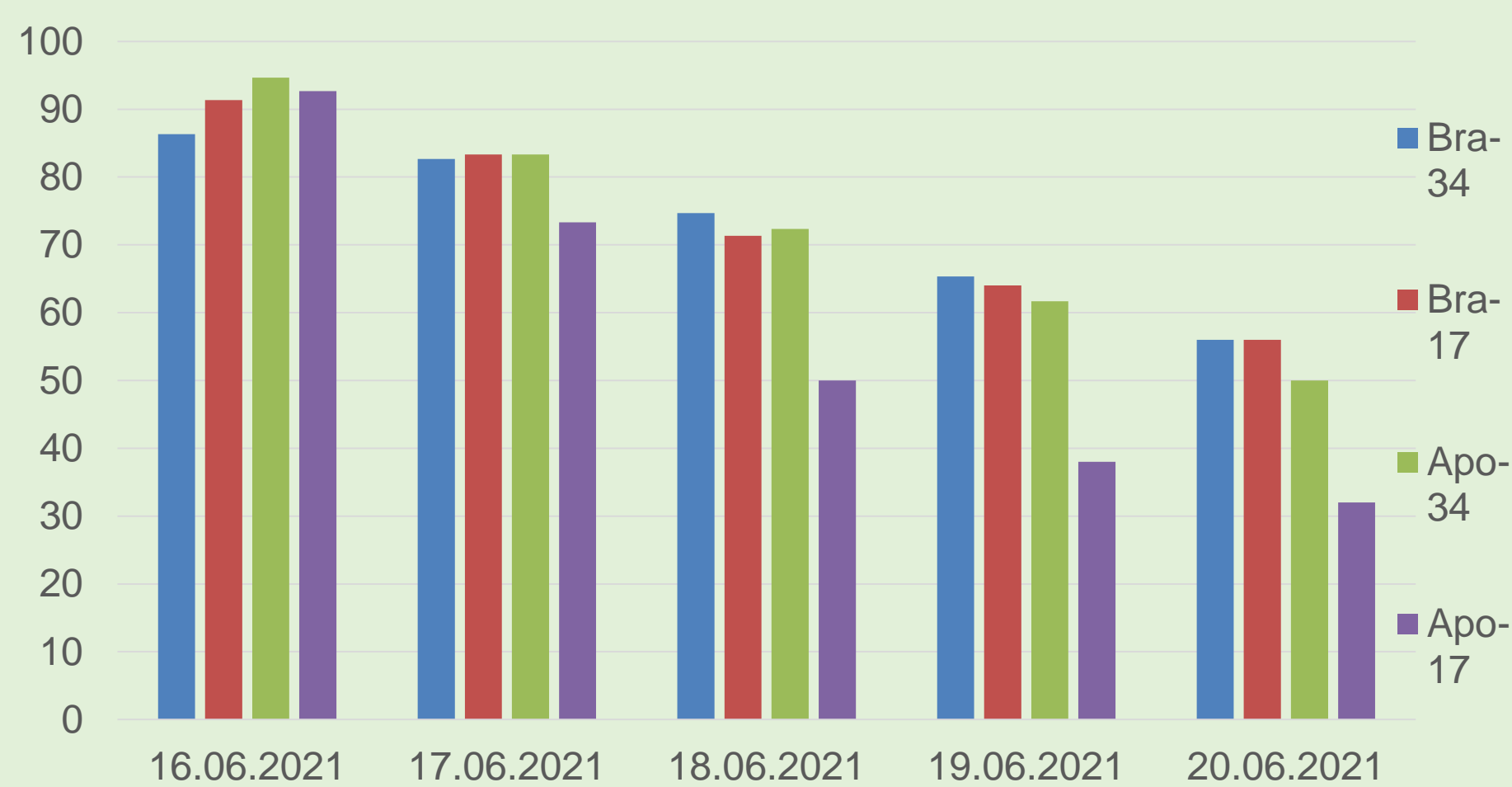


Figure 1. Survival rates from dph 3 until dph 7 for the 4 diets

- At **dph 7**, we observed feeding organisms **in the stomach** of all fish and in all diets, although we could not determined the amount for Bra-17 and Bra 34.

- For **pikeperch larvae fed with *A. panamensis***, we observed the **ingestion** of these **copepods** by *Sander lucioperca* (see Video) for first time



Video (to watch, scan QR code). Larvae after ingestion of one copepod which is still alive in the digestive system of the fish.

- ...but, 30 min maximal after intake, we observed the **excretion of the poorly digested copepods** (Figure 2).

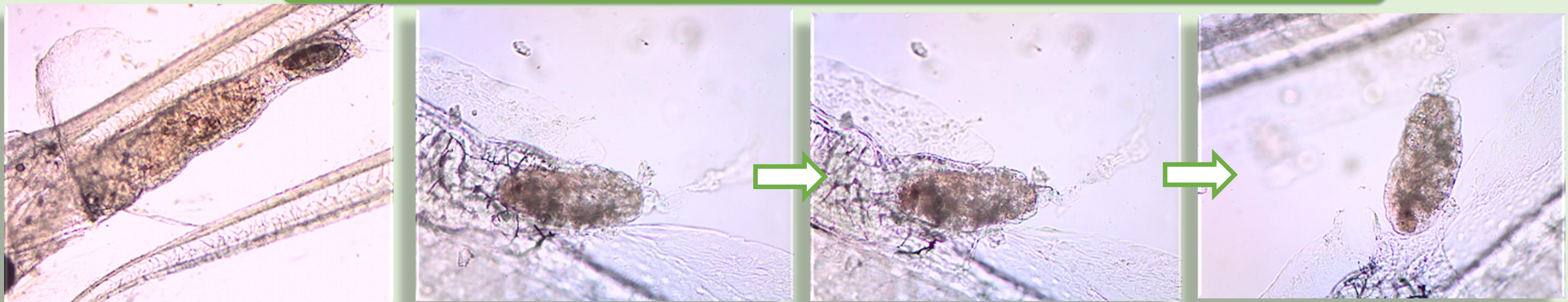


Figure 2. Serial photo shooting of one of the larvae defecating a copepod.

Discussion

- Our results showed ingestion of *A. panamensis* by larvae at dph 7, indicating appropriate live feed size but not digestibility

- Difficulty to count feed items inside the stomach of larvae fed with *B. plicatilis* might show that **the digestion was taking place**
- Diets with *B. plicatilis* showed **higher survival rates**

- **Suitability of *B. plicatilis*** as live feed better than *A. panamensis*. (*B. plicatilis* suggested as live feed by Yanes-Roca et al. 2018, Imentai et al. 2019, Imentai et al. 2020).

