

# Phenology and variation in reproductive effort in *Unio crassus*

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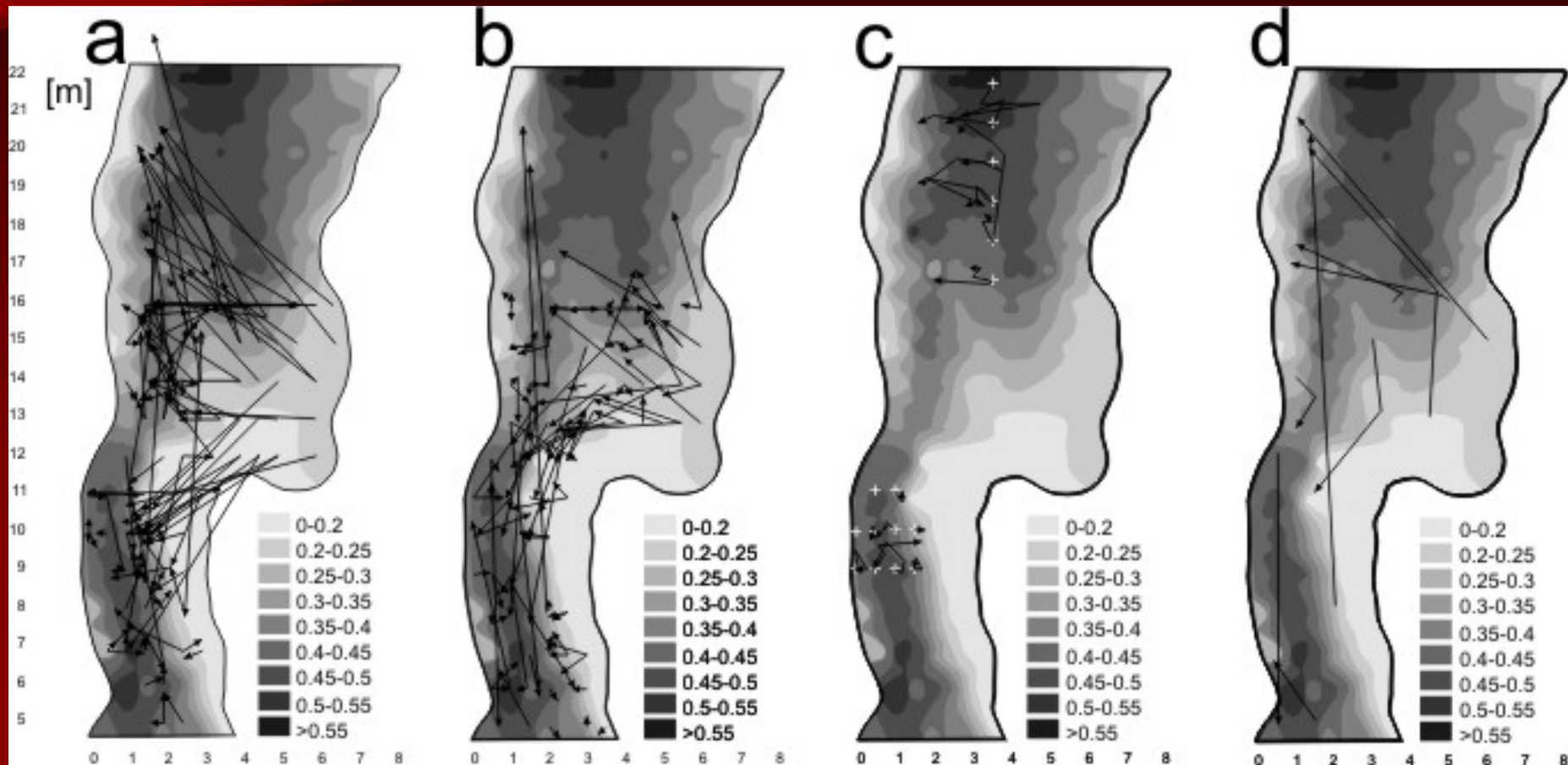
# Monitoring:

- Spatial distribution
- Number
- Mortality
- Reproduction

# Where are they?

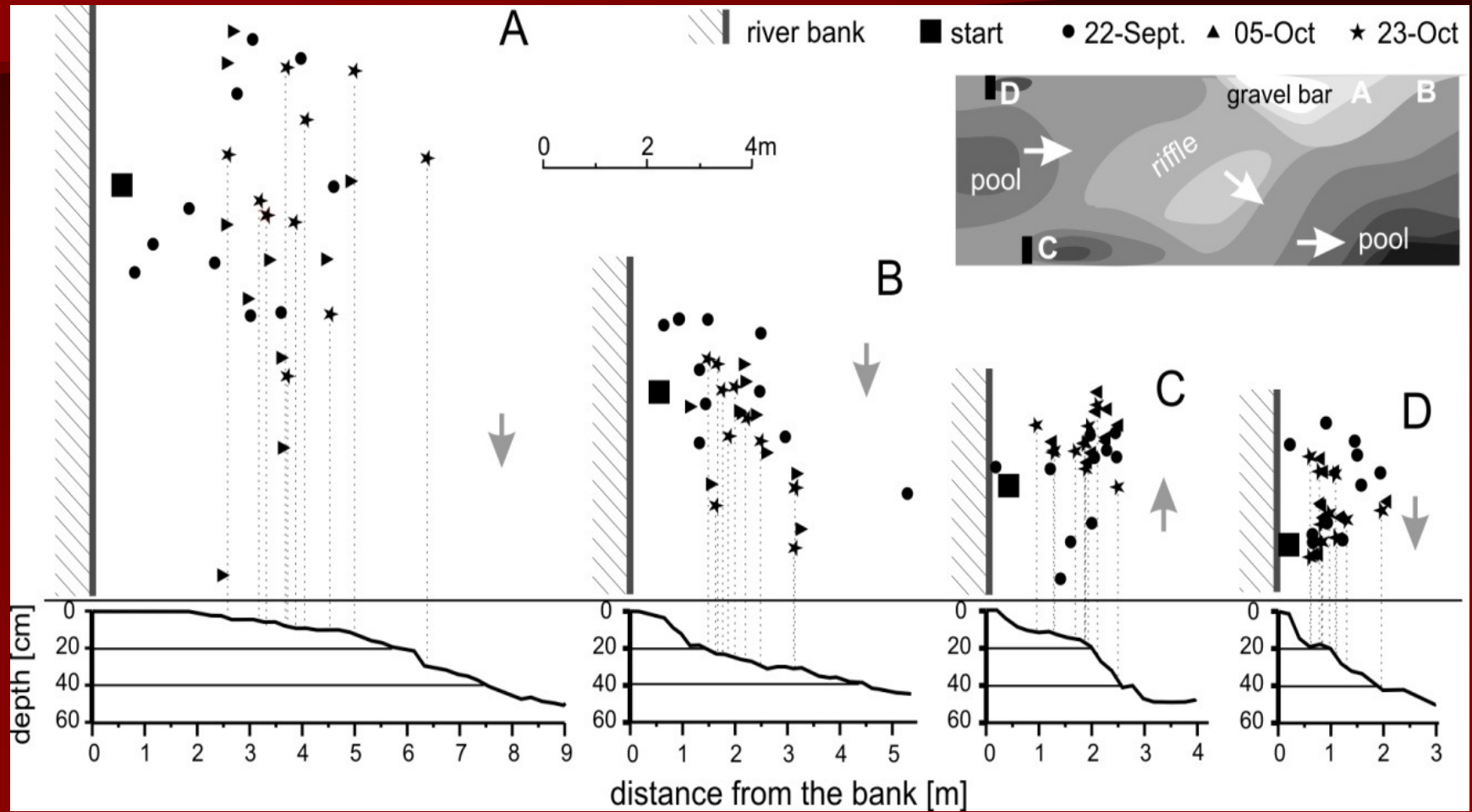


# Small stream



Clervaux 2010 and Journal of Conchology 40: 446-461, 2011

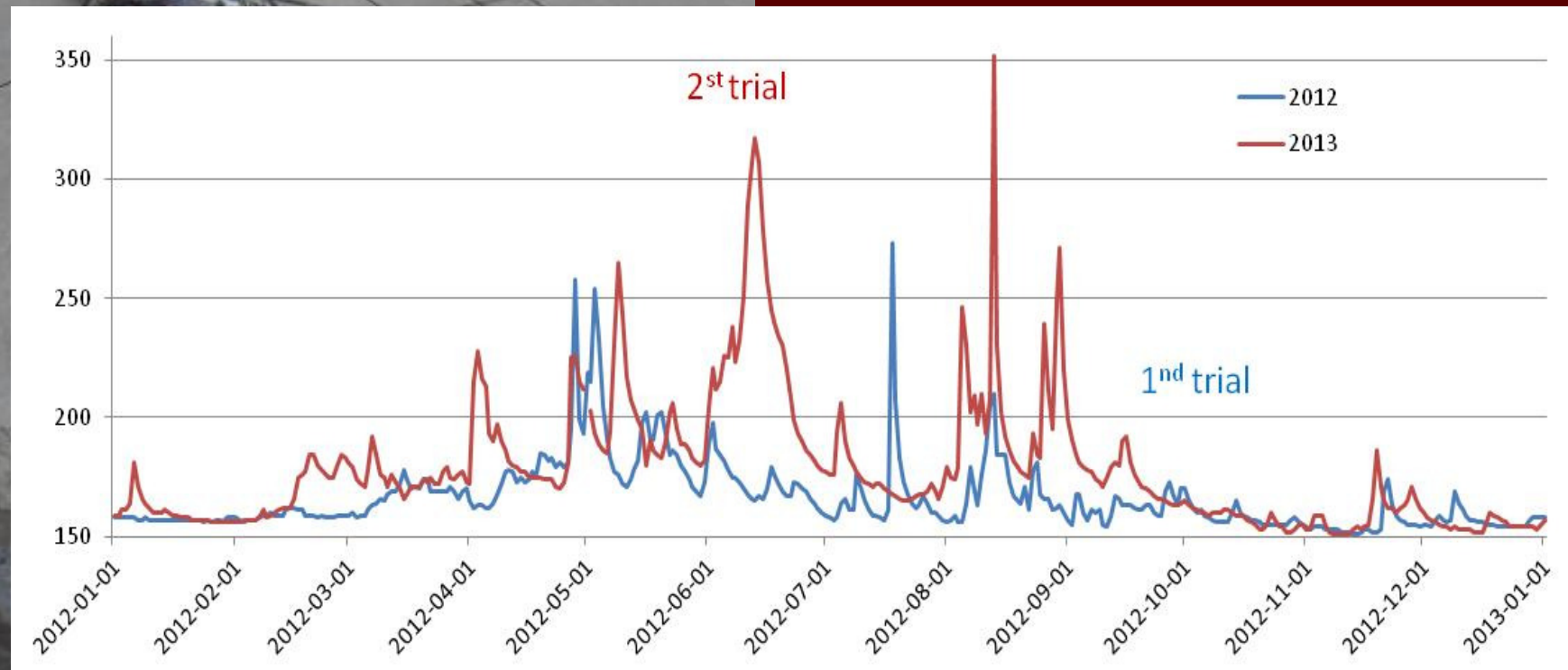
# Behaviour



# Behaviour

(Aquat. Conserv. ? 2019?)

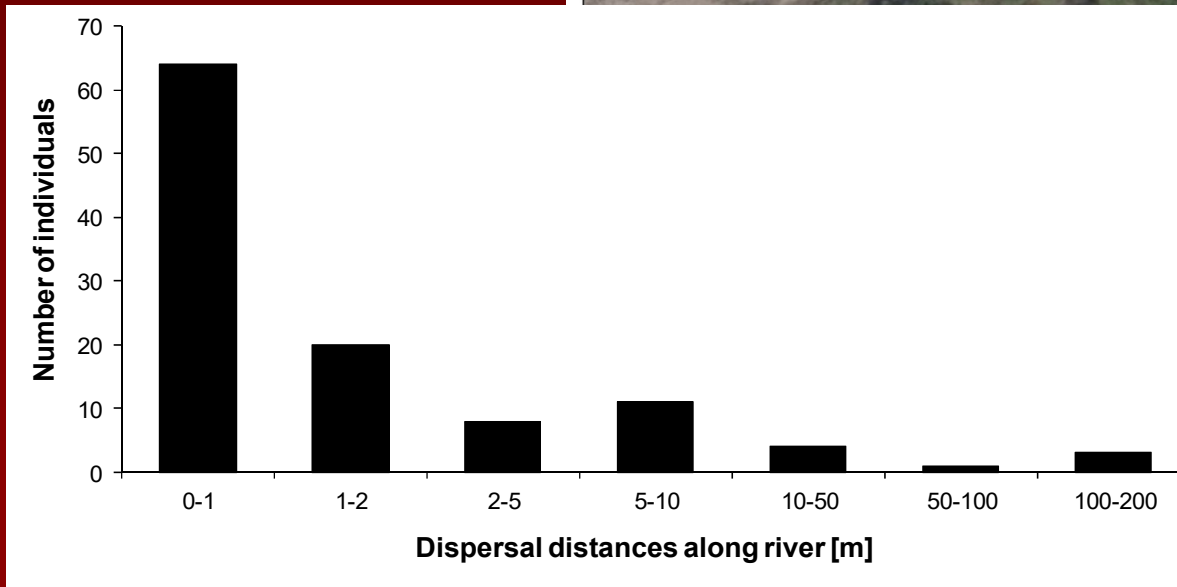
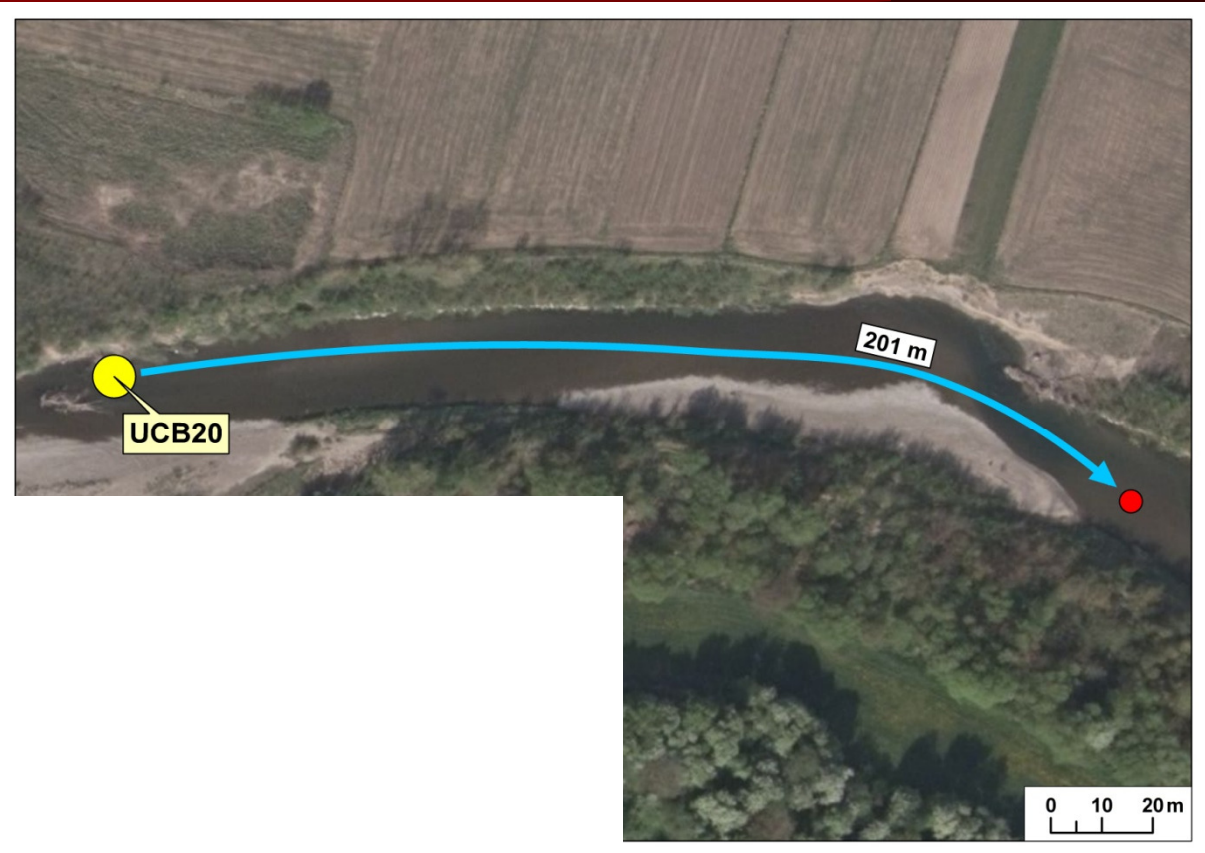
Daily river levels



# Mortality

- 1st trial – zero
- 2nd trial – 91 found again – 3 dead with transmitters (ca 3.3%)
  - Md per site = 9
  - 15% burrowed completely
  - 20% invisible (roots, boulders)
  - 19 (17%) not found again, although with transmitters

# Dislodging





# Dislodging

- regulated:

- $d_{max} = 48.6\text{m}$ , wild  $d_{max} = 1.8\text{m}$ ,  $p = 0.025$   
( $n = 11$ )

- destroyed:

- $d_{max} = 63\text{m}$ , stable:  $d_{max} = 2.58\text{m}$ ,  $p = 0.014$

- character:

- Lentic  $d_{max} = 2.5\text{m}$ , lotic ( $d_{max} = 76\text{m}$ ,  
 $p = 0.045$ ).

# Success in field

Science of Total Environ. 2018, v.624



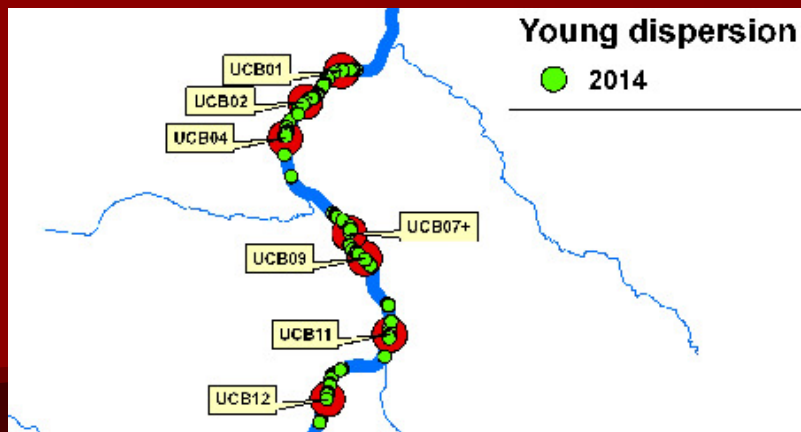


Young  
● 20

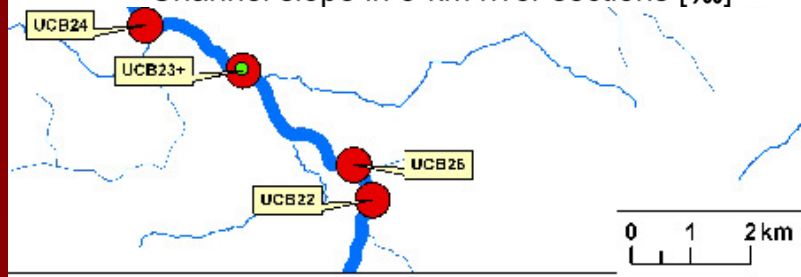
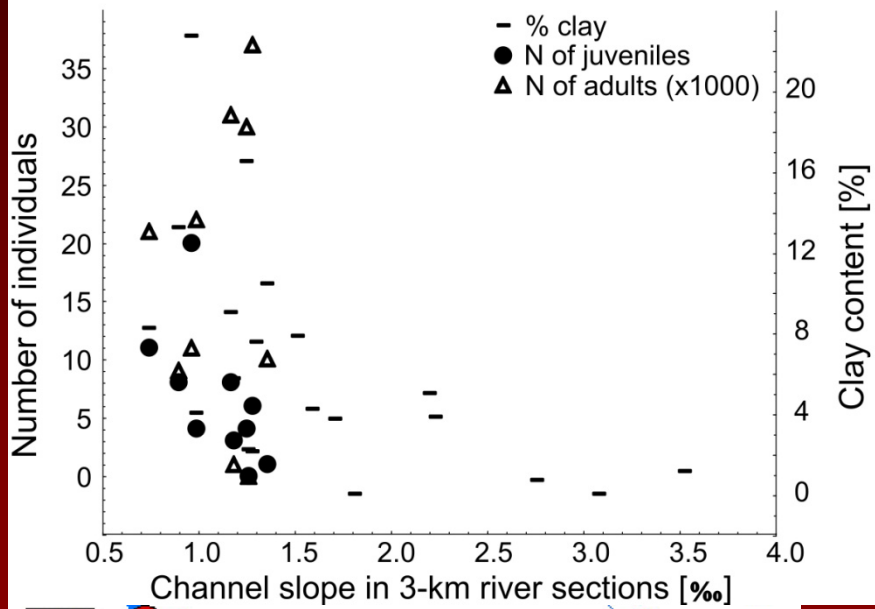
UCB01

UCB02

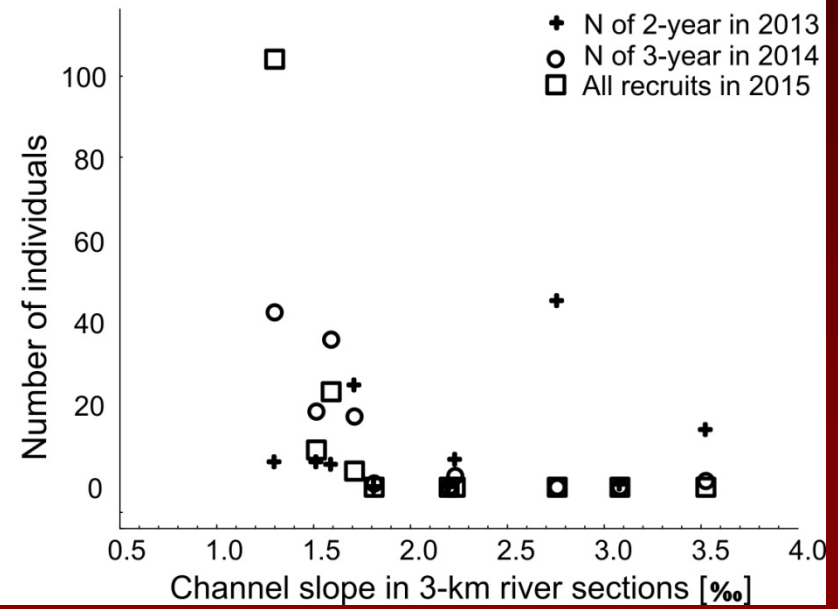
UCB04



**A Main population**



**B Re-introduced**



**EU investment boom = gravel fever...**



# Problem with reproduction



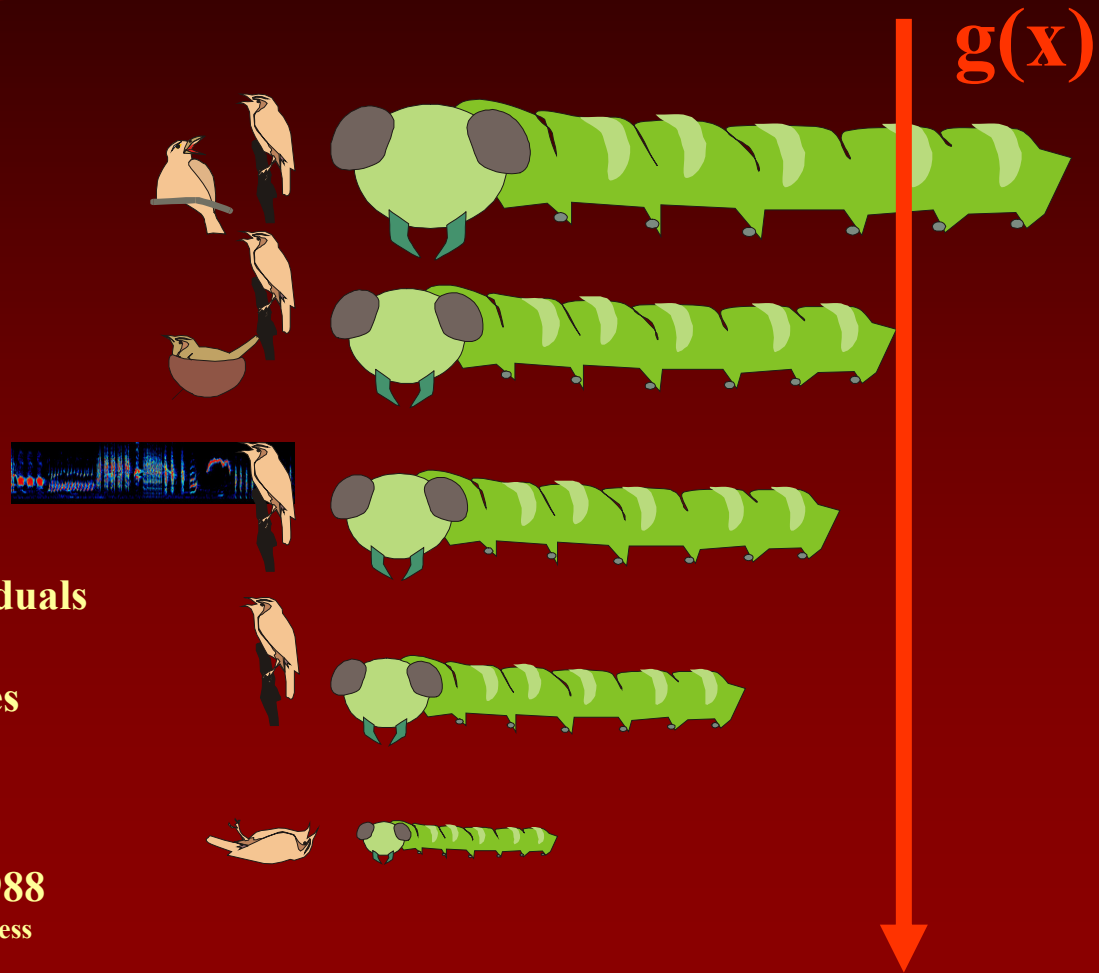
# Population growth and energy allocation of an individual

$$N_{(t+1)} = h \times \sum_{x=1}^K g(x)$$

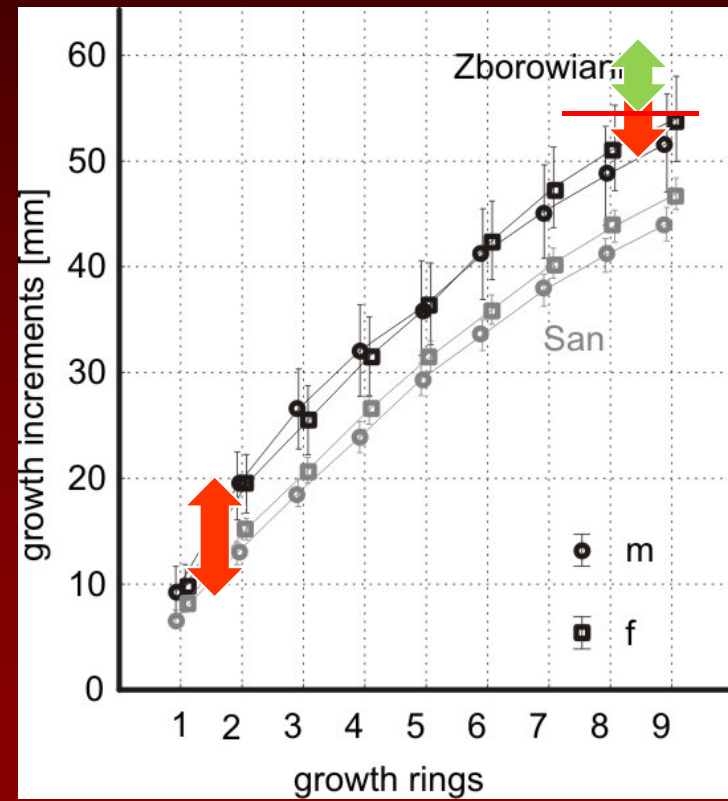
$N_{(t+1)}$  – the number of individuals in the next generation

$g(x)$  – sum of resources allotted to reproduction by  $K$  individuals

$h$  – efficiency of converting resources into offspring



# Allocation





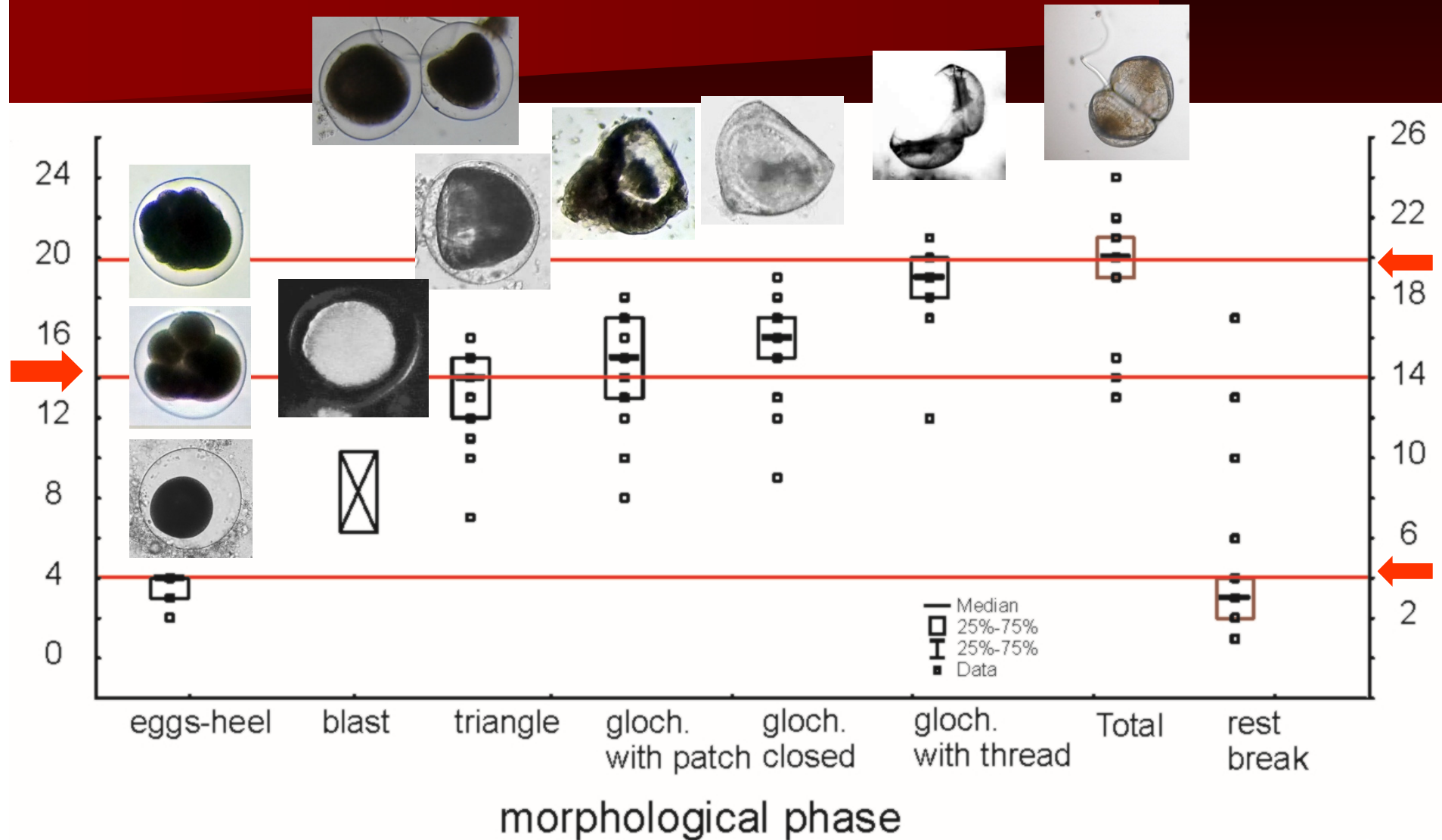
# Fish... and chips!

- $N_{t+1} = P$  (fish infestation)
- $N_{t+1} = P$  (fish infestation) \* N of glochidia

# Rozród



# Development rates

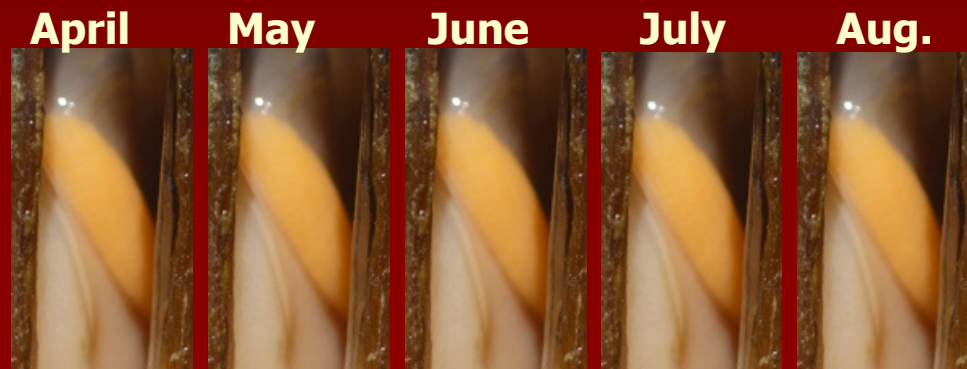


# Obvious problem

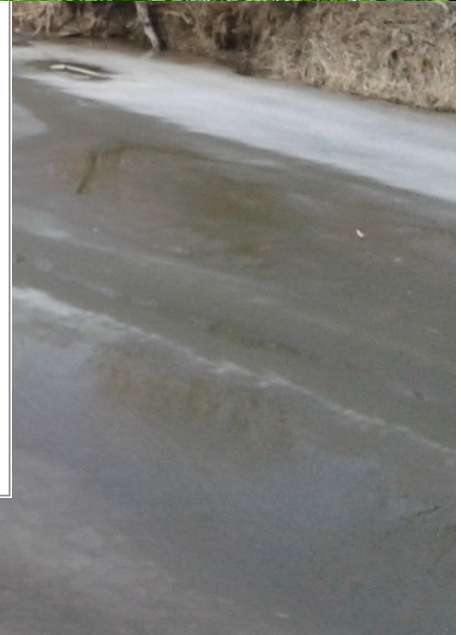
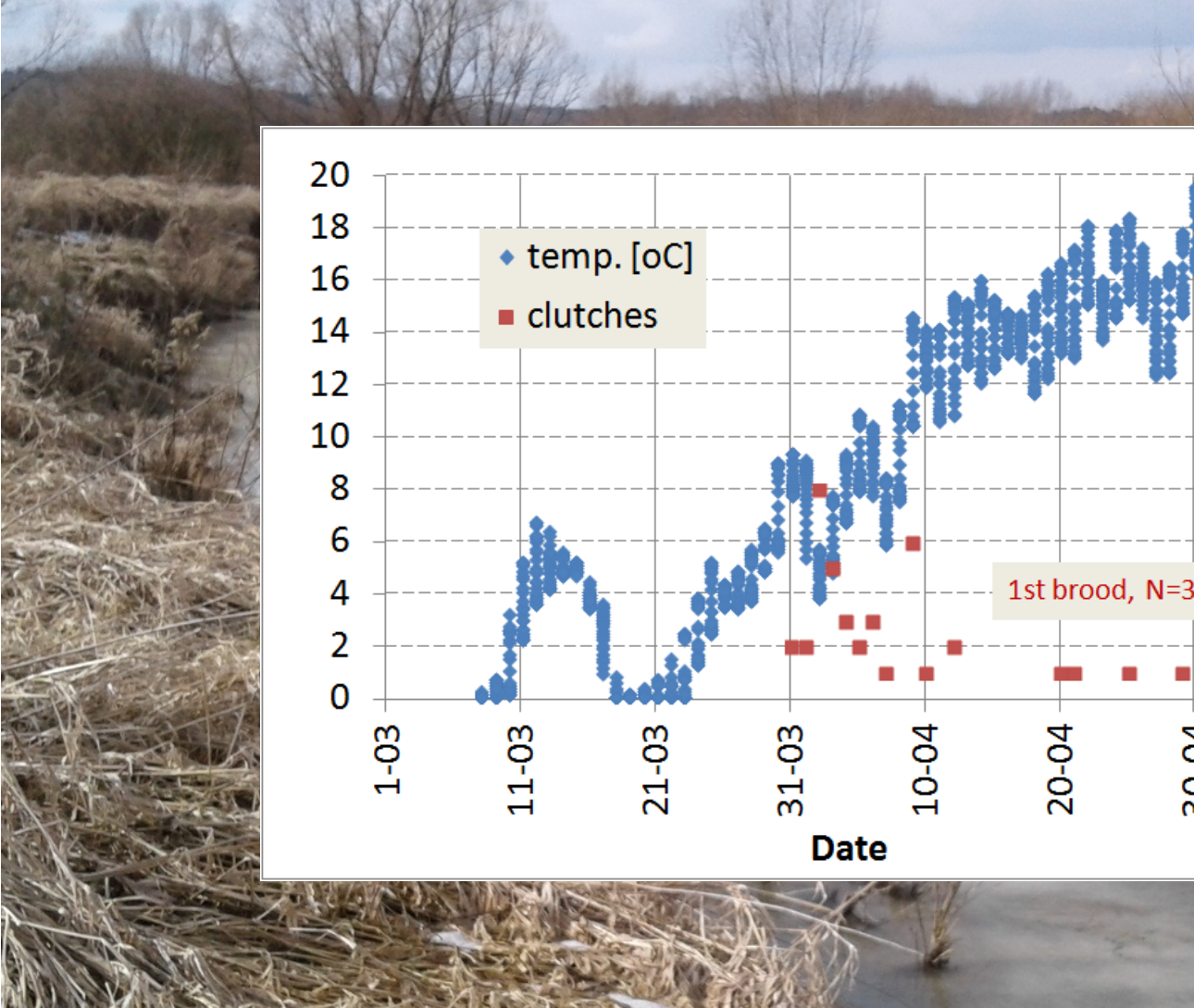
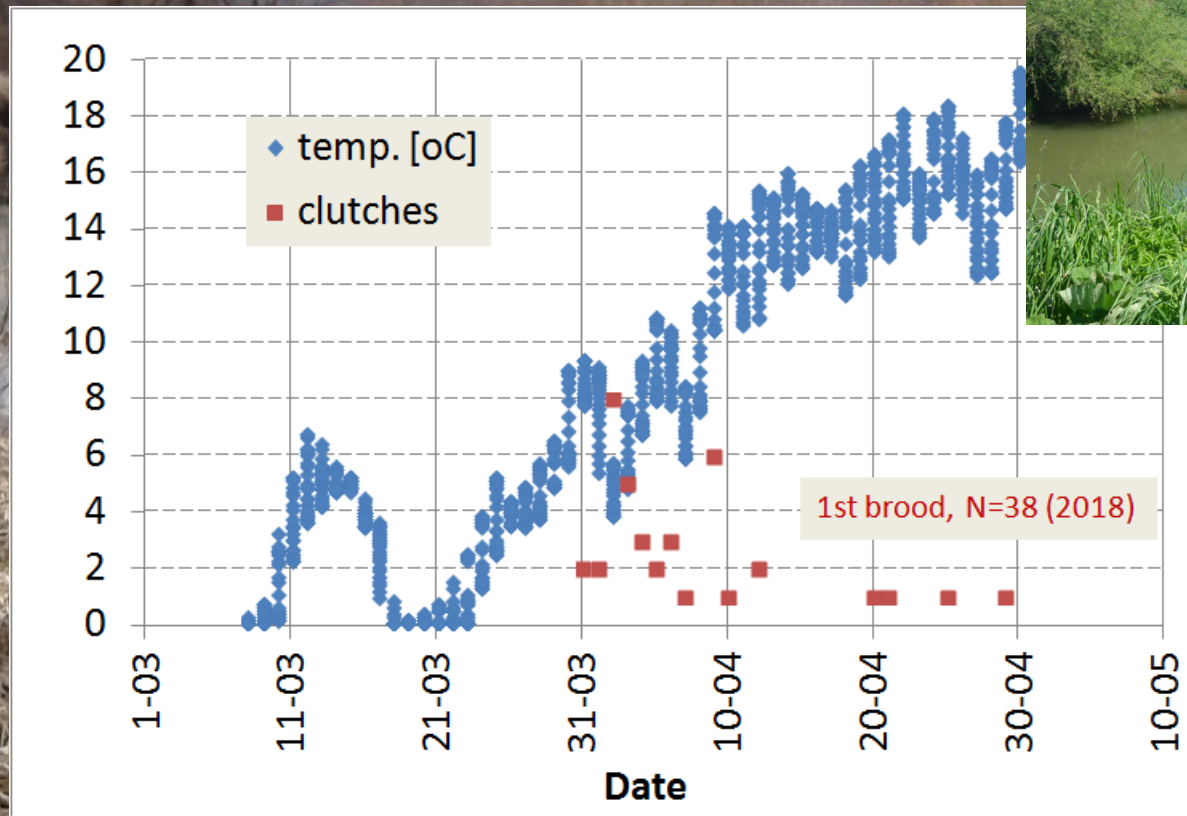
- Counting glochidia?



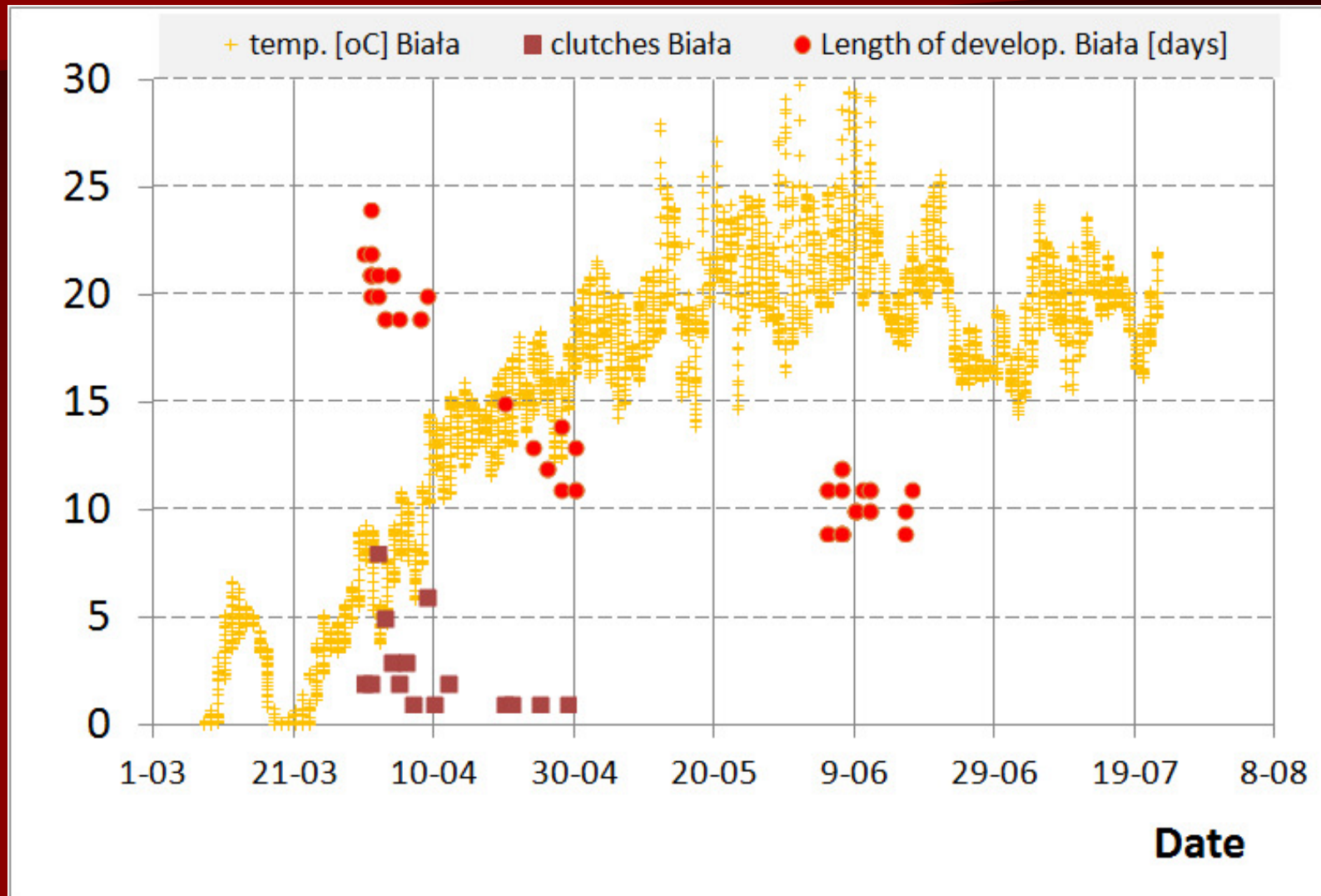
- Instead:
  - Time & how many broods?



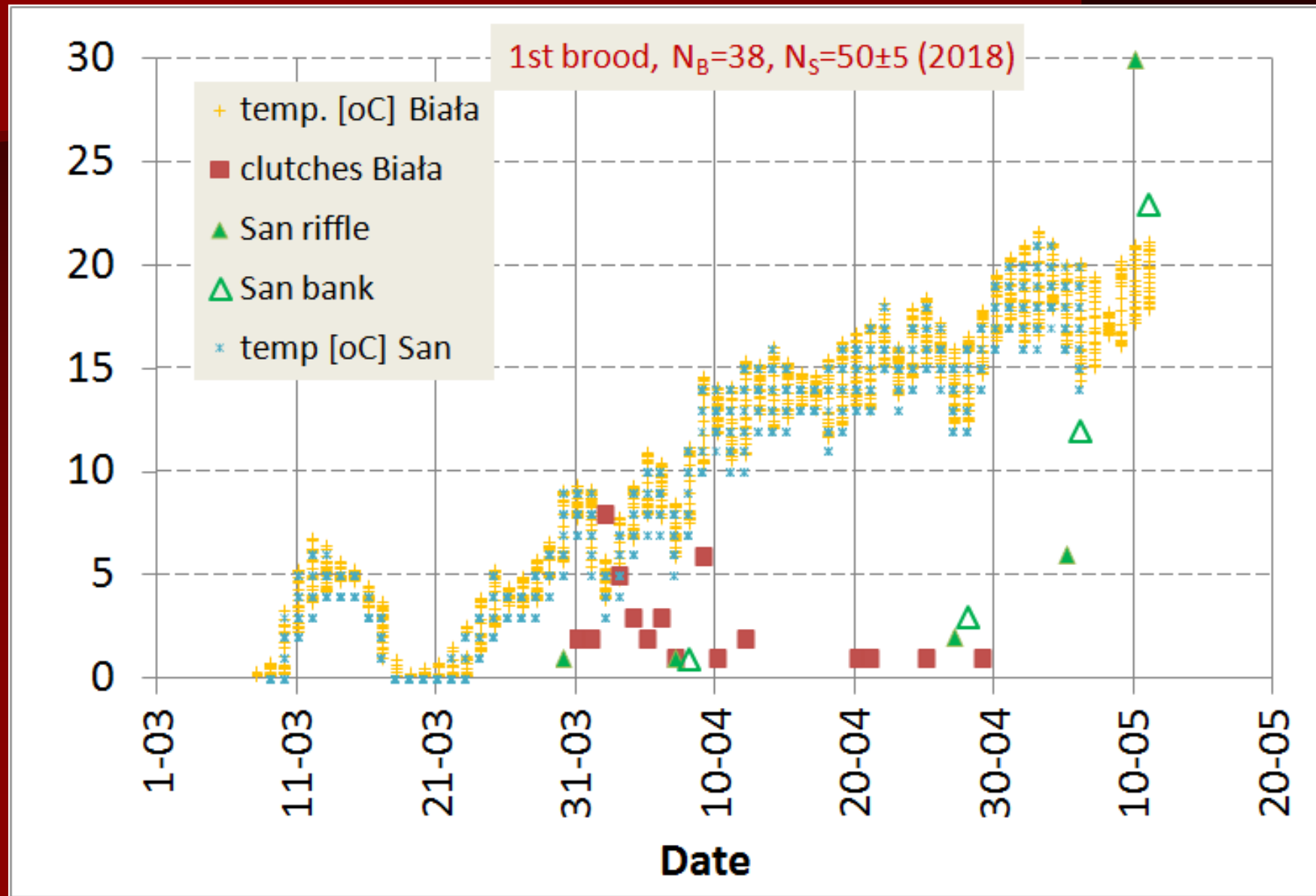
# The onset

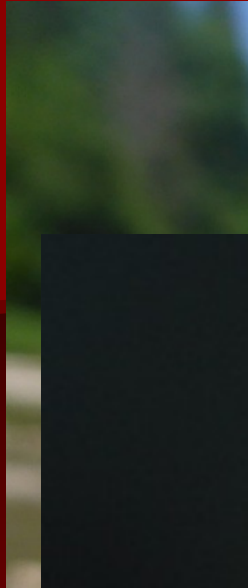


# Development and temperature



# The onset – the difference





**bulky**

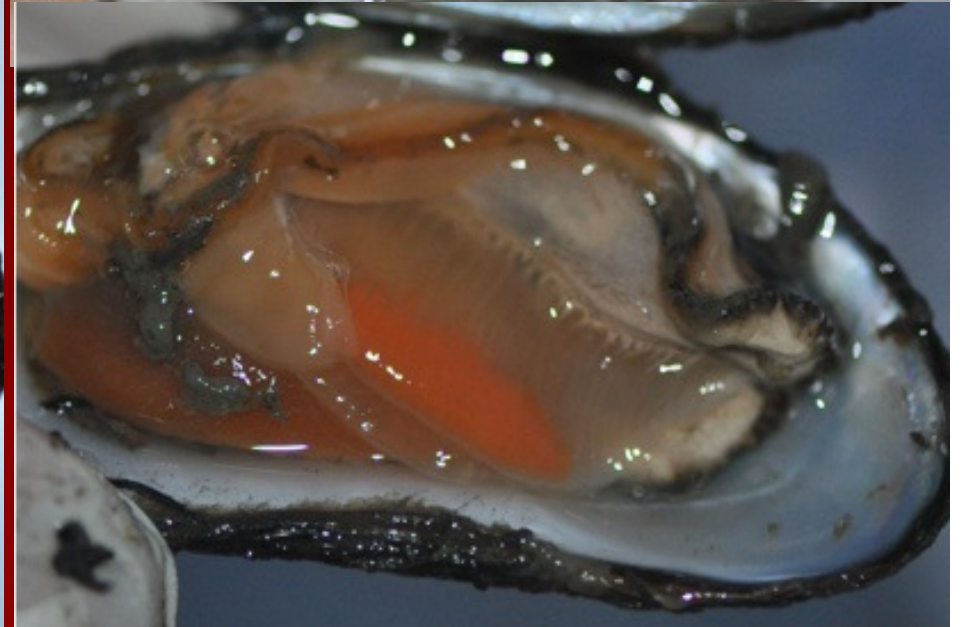


**thin**





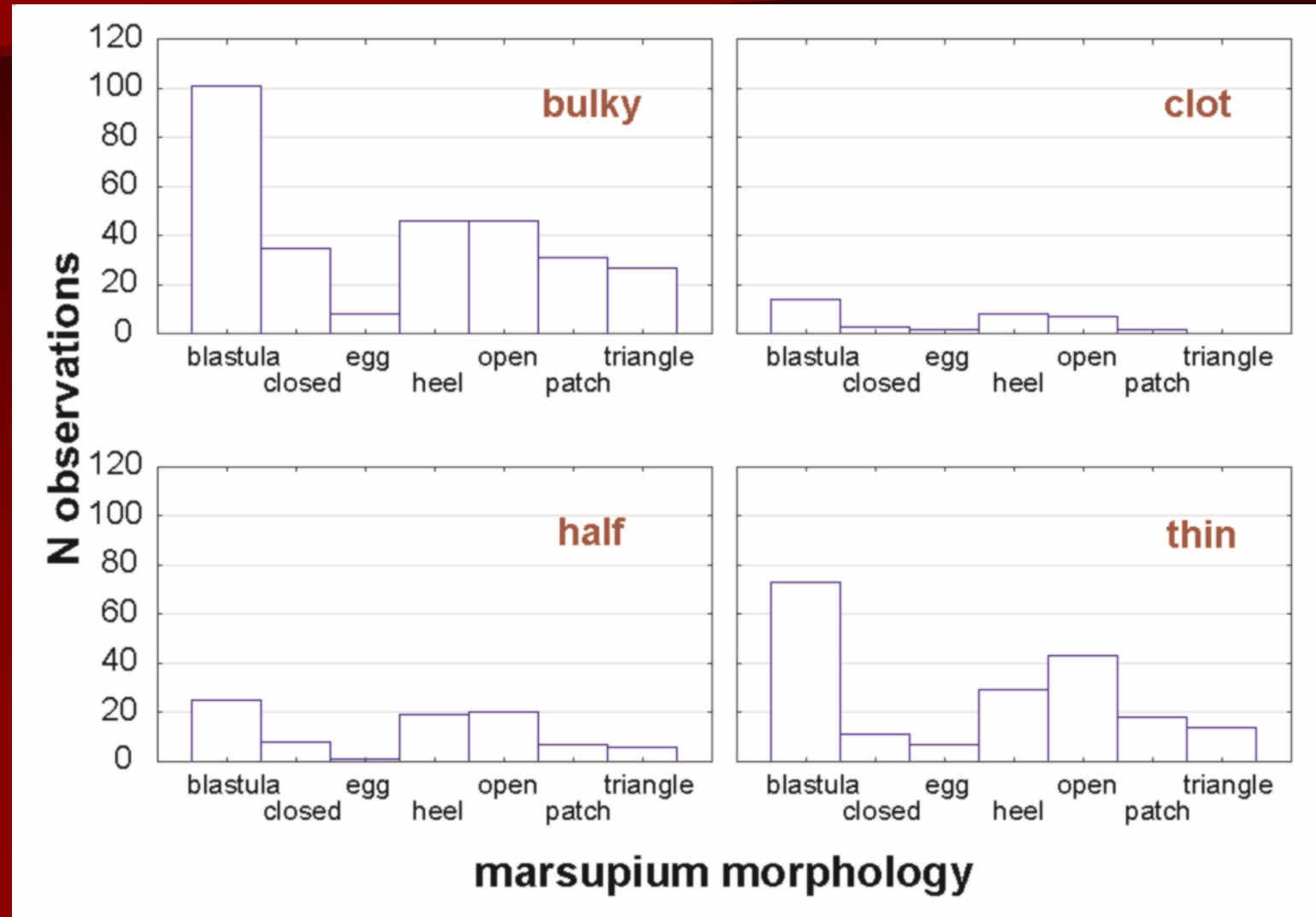
# Halfs...

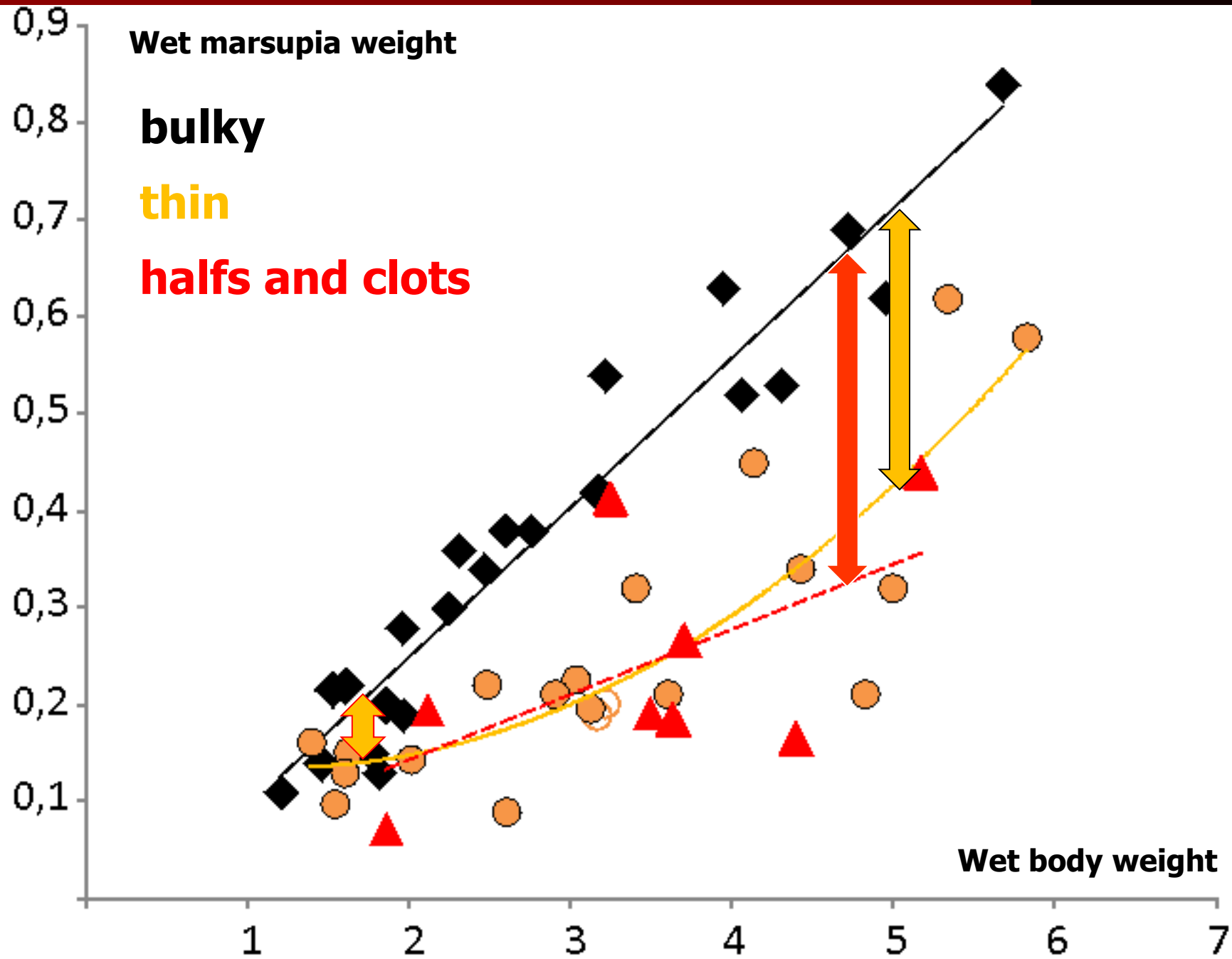


# Clots

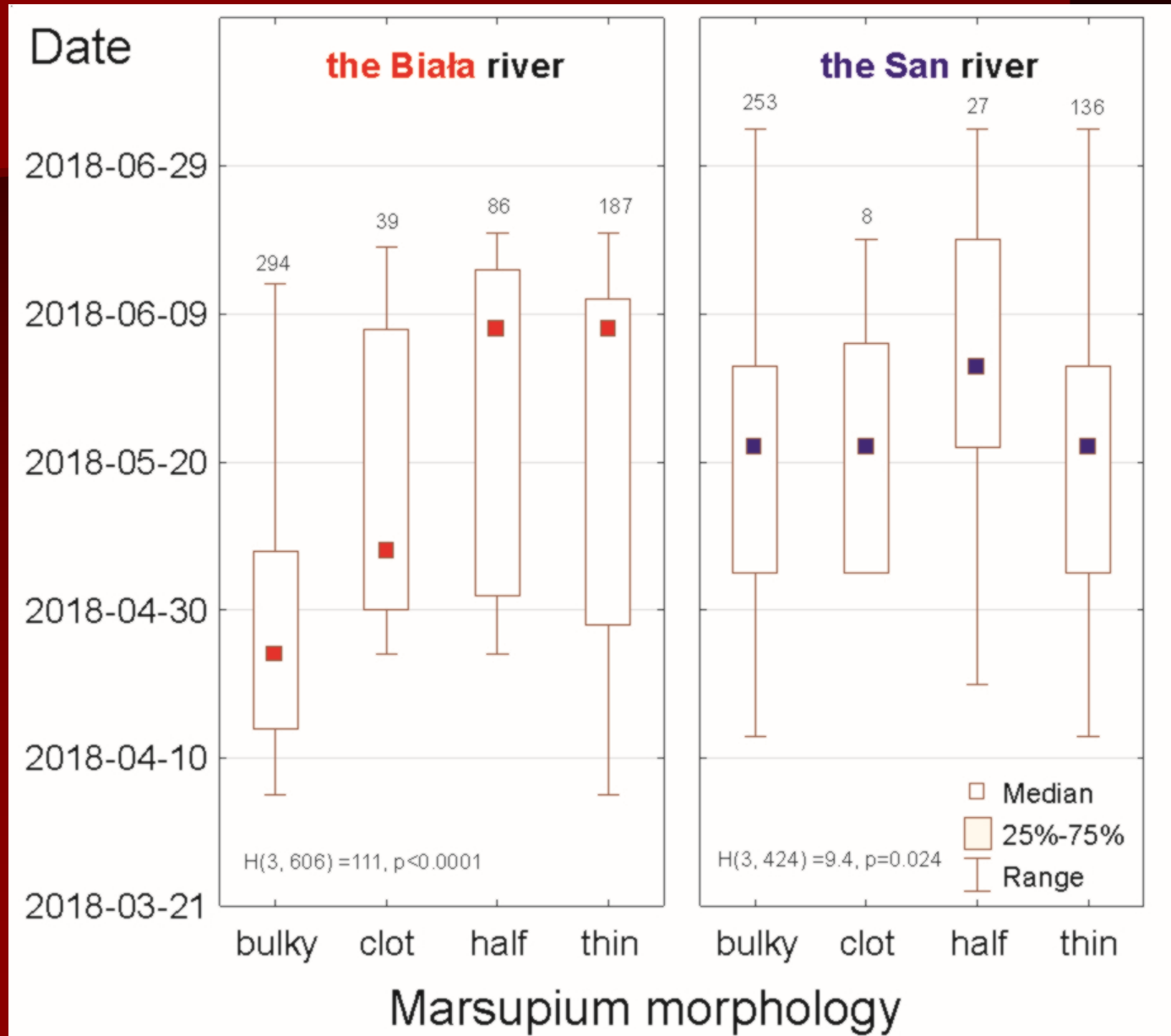


# Stadium of embryo vs morphology of marsupium

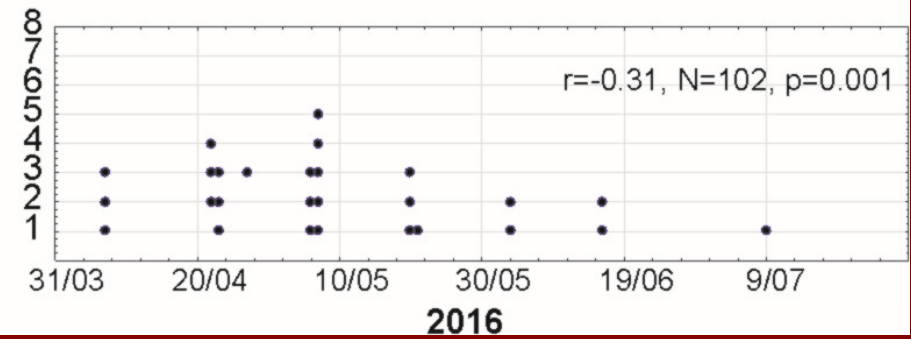
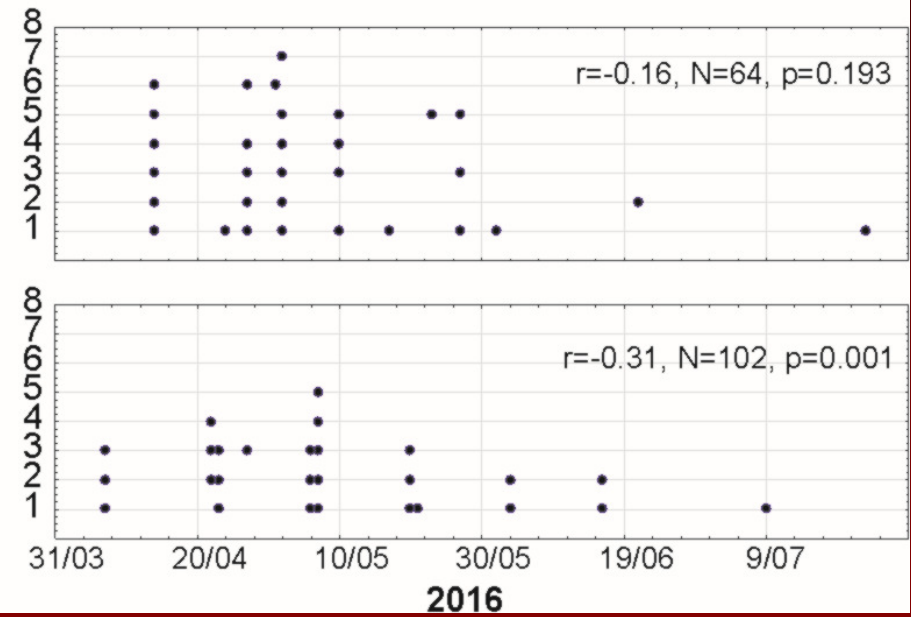
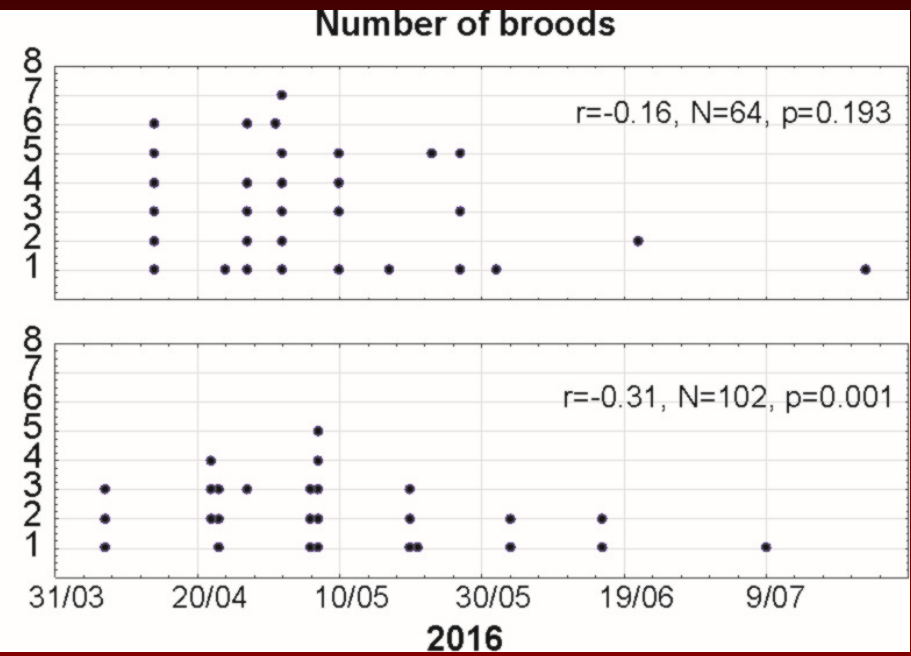
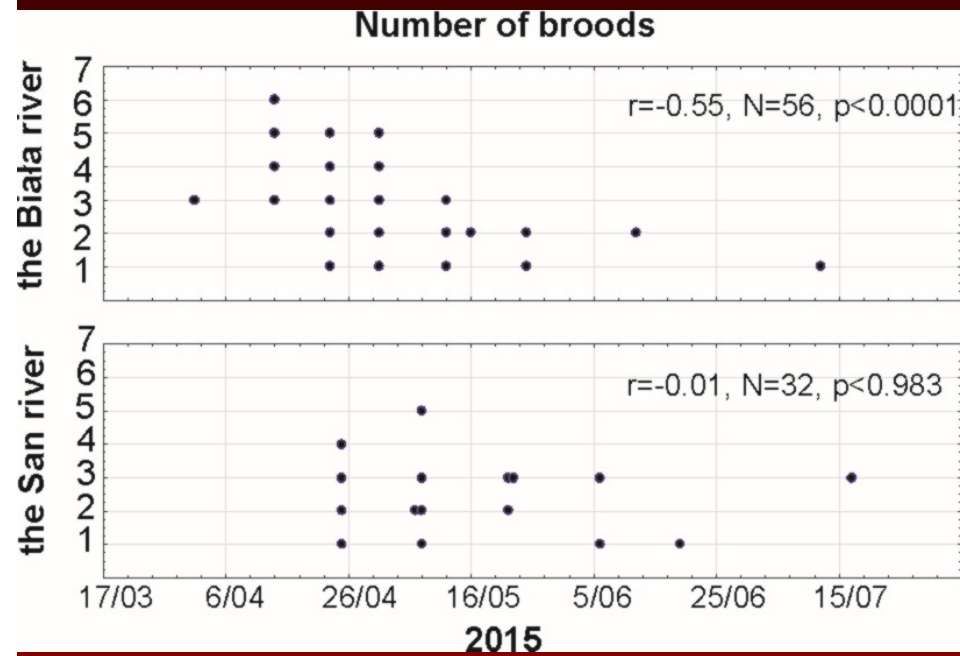




# Phenology vs reproductive effort



# Number of broods





**The team:**

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**Thank you !**