

DO THE SHAPE AND SIZE OF THE FORCIPULAR APPARATUS SIGNIFICANTLY DIFFER BETWEEN SEXES IN CENTIPEDE *LITHOBIUS MELANOPS* NEWPORT, 1845 (CHILOPODA: LITHOBIOMORPHA: LITHOBIIDAE)?

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Introduction and the aim of the study

- Intersexual differences in morphological traits have been investigated in many arthropods, since they might have an effect on adaptive values at the population level.
- In many studies, size and shape sexual dimorphism in morphological traits have often been analysed together.
- In the present study, the forcipular apparatus, which has a crucial role in survival (i.e. feeding and defense) in centipedes, was chosen as a suitable morphological structure for analysing size and shape sexual dimorphism.
- In this respect, we investigated size and shape intersexual differences in the parts of the forcipular segment (forcipular coxosternite + forcipules) in the centipede *Lithobius melanops* Newport, 1845, by using geometric morphometric approach.

Materials and Methods

- Both females and males of *L. melanops* (Figure 1), on matusus junior stage and matusus stage, were analysed.
- Sample site: Dobanovci, near Belgrade, Serbia.
- 30 landmarks on each morphological structure were digitized in TpsDig program (Figure 2).
- Centroid size, as the measure of size in geometric morphometrics, was calculated in CoordGen program.
- Principal Component Analysis (PCA) and Canonical Variate Analysis (CVA), for both symmetric and asymmetric components, were conducted in MorphoJ program.
- The existence of size sexual dimorphism in the forcipular apparatus was tested in R program.



Figure 1. Individual of *L. melanops* on matusus junior stage.

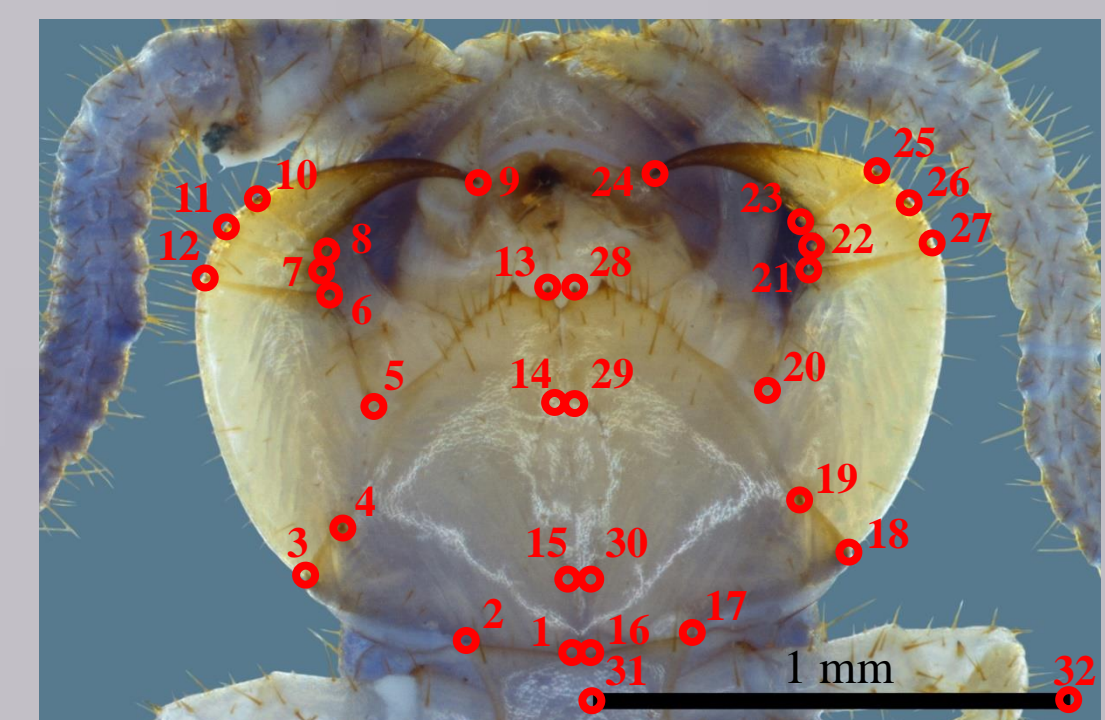


Figure 2. Landmark positions on the forcipular apparatus of *L. melanops*

Results and Discussion

- Results of ANOVA indicated no size sexual dimorphism in forcipular apparatus ($F_{1,44} = 2.05$; $p = 0.16$) (Figure 3).
- Similarly, the results of CVA on both symmetric and asymmetric components revealed no shape sexual dimorphism in aforementioned morphological structure ($p = 0.7422$; $p = 0.8311$; respectively) (Figure 4).



Figure 3. Intersexual differences in size of forcipular apparatus in *L. melanops*

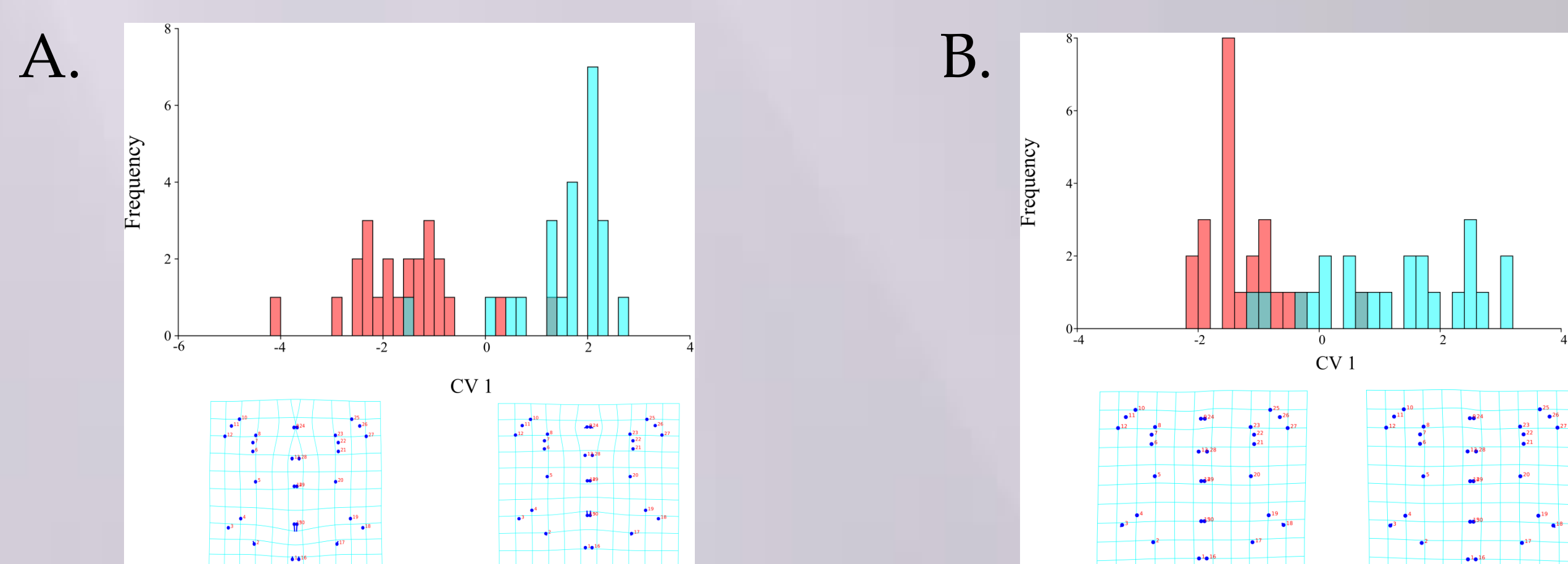


Figure 4. Intersexual differences in shape of forcipular apparatus in *L. melanops* evaluated by the CVA performed on: A. symmetric component, and B. asymmetric component. Females – red bars, males – blue bars.

Conclusions

- Results of the present study indicate that the forcipular apparatus, which is of crucial importance for feeding and defense, may be conserved during the evolution in *L. melanops*.
- In fact, any change in morphological structure with such important functions may lead to a decrease of the adaptive value and consequently diminish the probability that individuals will survive in variable environmental conditions.