ABSTRACT

Flower chafers are well-known beetles with apparent sexual dimorphism. Yet, in contrast to other groups of scarab beetles, only little attention has been paid to various aspects of this phenomenon. It concerns also sexual dimorphism in size, which is very common in animals. Although ultimate causes of sexual size dimorphism have been extensively studied, the developmental mechanisms are still only poorly understood. We investigated proximate causes of sexual size dimorphism in several differentially dimorphic flower chafer species. We found that in highly dimorphic species the dimorphism started to develop already in the first instar and tended to accumulate through successive larval development. In contrast, the sexes in species with a relatively low dimorphism diverged in size during only one instar. Moreover, we found variability not only in when the dimorphism arises during development, but also how: sex-related differences in both the instar duration and average growth rate were the proximate causes of sexual size dimorphism. In addition, we showed that the sexes may differ also in growth trajectory - males had relatively longer period of rapid growth than females, even in cases where the absolute development times were similar in both sexes.

Further, we focused on systematic survey of sexual size dimorphism in flower chafers. It seems that male-biased sexual size dimorphism is more common in Cetoniinae than in other insect groups (where the female-biased sexual size dimorphism predominantly occurs). Our results also indicate that this dimorphism in size can be associated with sexual differences in body shape. In addition, it seems probable that there exist differences in body size and shape between horned and hornless species.

As a part of the study of immature stages of Cetoniinae, we described larval morphology of 12 species from three tribes. Larvae of the tribe Taenioderini were described for the first time, and the newly described 8 species significantly contributed to our understanding of this group. This is because larval morphology proved to be a very useful for study of scarabaeoid phylogeny.