

78th Congress of the
Unione Zoologica Italiana

118th Congress of the
Société Zoologique de France

*Second Joint Meeting of Société Zoologique de France and
Unione Zoologica Italiana*

Torino, 18-23 September 2017

The evolution of animal diversity: a comparative approach

Abstract Book



Department of Life Sciences and Systems Biology - University of Torino

MALE GENITALIC ASYMMETRY: THE CASE OF *ONTHOPHAGUS PRAESTANS* PÉRINGUEY, 1901 (COLEOPTERA: SCARABAEIDAE)

The *Onthophagus* species are tunneling, and the males exert a guard behaviour of the female and ephemeral, limiting food sources (i.e., dung or carrion). Due to their behavioural simplicity, the genus has had a massive reproductive success. The speciose genus *Onthophagus* fit exactly the suggested scenario in studies of morphological traits involved in the insect mating system. The combination of such factors as the intense reproductive competition, limiting resources, and one-on-one contests of strength (i.e., duels) engrossed in the rapid evolution of exaggerated morphological weapons. In *Onthophagus*, the intensity of the male-male reproductive competition has led to the development of such weapons as long horns or laminae used to keep out the rival males from their territory by a face-to-face combat. Aspects related to the reproductive contest refer to evolution of extreme weaponry (secondary sexual traits), but also to striking changes in primary sexual traits, as could be the haphazardly appearance of genitalic asymmetry that can affect different parts of the genitalia. Studies on the evolution of asymmetry in male genitalia refer to many taxa, being the phenomenon widespread in insects. Its taxonomic distribution nevertheless suggests numerous events of parallel evolution, being independently developed in various un-related taxa. The phylogenetic patterns of symmetry/asymmetry of male genitalia are beginning to be elucidate, although a comprehensive knowledge of the phenomenon is far to be acquired. It was suggested that in insects the evolution to the male-dominated position during the copula have led to male genitalia asymmetry to accommodate the rotation and flexing of the abdominal tips (SCHILTHUIZEN et al, 2016). Additional explanations are surely required, and various alternative hypotheses are suggested to explain the asymmetry evolution, that can be viewed as a component of the more general rapid and divergent evolution of male genitalia. In *Onthophagus praestans* peculiar features of male genitalia and female pygidium were highlighted. In this species the vertex carina of males constitutes a small pointed tubercle which does not show any exaggerated development as in other *Onthophagus* species. Besides, also the pygidium can be regarded as a secondary sexual trait and in *O. praestans* its development is rather interesting: a markedly asymmetric paramers were paired to the presence of a single evident tooth on the inner lateral surface of female pygidium, allowing thus the two structures to be tightly joined together, making easier the coupling. This dramatic case of coevolution is not a common phenomenon, since in other known cases of asymmetry of paramers, as *O. savanicola* Cambefort, 1984, the female pygidium doesn't carry a toothed structure similar to the one of *O. praestans*.

claudia.palestrini@unito.it