

How does one sex grow larger than the other?

January 29 2007



Argiope aurantia spiders. Credit: photograph by Matthias W. Foellmer

Why are males larger than females in some animal species (such as most mammals), females larger than males in others (such as most insects), and why are the sexes alike in yet other species (such as several birds)? Further, how is such sexual size dimorphism achieved when it exists? If males and females grow at the same rate, then the larger sex has to extend its growth period. Alternatively, the larger sex can grow faster.

A group of 13 researchers from 10 countries investigated the latter

questions using comparative data on 155 species of insects and spiders (arthropods) from 7 major groups.

The results, published in the February issue of *The American Naturalist*, suggest that, generally, growth rate differences between the sexes are more important than growth period differences in mediating size dimorphism in arthropods.

Nevertheless, depending on the species group, males and females tend to have equal growth periods (beetles and water striders), males have longer growth periods than females (two groups of flies), or males have shorter growth periods than females (so-called protandry), albeit not quite in proportion to the size difference between the sexes (spiders, butterflies, and Hymenoptera, i.e. bees, ants, wasps, and alike).

As in most arthropod groups females are larger, they must therefore generally grow faster, an interesting pattern markedly different from primates and birds, which were also analyzed and in which differences in growth period between the sexes were generally more dominant. Three potential explanations for why female arthropods can grow faster than males are discussed.

The most intriguing of these explanations is that, although it is generally cheaper to produce (small) sperm than (large) eggs, it may be costlier to produce male gonads and genitalia than it is to produce female gonads and genitalia. As a result, males might need more time to mature at larger body sizes.

This world-wide collaboration developed because most people work and thus have data on only particular animal groups. Wolf Blanckenhorn of the Zoological Museum at the University of Zurich in Switzerland called together all these researchers to investigate this specific idea about the evolution of sexual size dimorphism that had occupied him for quite

some time.

Source: University of Chicago

Citation: How does one sex grow larger than the other? (2007, January 29) retrieved 28 April 2024 from <https://phys.org/news/2007-01-sex-larger.html>

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