How to Sex Every Reptile and Amphibian! Is Your Pet Male or Female?-Invertebrate Edition!

One of the most commonly asked questions, by both new and seasoned pet owners and reptile keepers alike, are the sex or gender of their pets. Unlike mammals, and even many other more familiar groups of animals in which their sexes are much more familiar to us, and can be much more readily distinguishable, reptiles and amphibians have vastly differing anatomies and physiologies, which oftentimes might make determining their sexes more challenging or difficult. Many can be sexually dimorphic in size between males and females, while others can be difficult to determine sex until their sub-adult or adult forms, being very difficult, if not impossible to determine in their younger forms, or as hatchlings or juveniles. Others yet can be parthenogenetic, consisting of primarily one sex, or even, in some cases, the ability to switch sexes depending on environmental and physiological conditions! Sometimes, the deposition of infertile eggs, ova, or other specific health and reproductive cues can also occasionally indirectly point to the likely sex of an animal as well.

While determining the sex of some animals can still be relatively easy once one learns what to look for and recognize, other methods should still be attempted only by veterinarians or other more experienced hobbyists or enthusiasts in order to prevent possible injury and undue stress to the animal. Many also display sexual behaviors characteristic of males or females, although there can often be overlap. Whether one is inquiring into the sex of their animal for the purposes of a new and exciting breeding project, or simply out of curiosity for one's own best knowledge and ability to provide the most tailored care and husbandry as possible, the following document shall be a great starting point for learning more about whether your pet is male, female, or in some cases, both!

Insects and Other Invertebrates:

-**Crickets and Grasshoppers**. In crickets, examine the length of the ovipositor, which is an egg laying appendage at the end of the abdomen which is much longer and more pronounced in females than males. Sexual dimorphism in size and differences in number abdominal segments can also be used to distinguish sexes, depending on the species. See following figure:

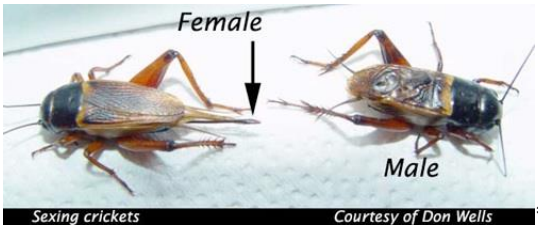

**Figure 1. Examining the ovipositor in male vs. female crickets. Credited to Don Wells.*

-**Walkingsticks and other Phasmids**. These insects can be difficult to sex, although they are believed to be temperature-sex dependent upon hatching from their eggs. They are normally either female, or parthenogenetic, and if males do appear, they are hermaphroditic, and not able to copulate successfully. They can also be sexually dimorphic in size.

**Figure 2. Example of the prominent sexual dimorphic characteristics of male (top) and female (bottom) Rhinoceros Beetles. Note the large "horn" in males.*

-Beetles. With well over 400,000 different species, determining the sex of your beetles can be varied and challenging. Some species, such as stag beetles (Lucanidae) and rhinoceros beetles (Dynastinae) are markedly sexually dimorphic in size, with males usually having much larger and more prominent horns or mandibles than females, used for combat with other male beetles. Some can be dimorphic in color and/or patterns between males and females. Others can be determined by the separation of their sternites, or widened plates on the underside of the abdomen, with little to no separation between the sternites in females.

-**Mantids**. Determining the sexes of mantids can depend quite a bit on the species. Many, however, are sexually dimorphic in size (females being larger and/or less slender than males), differences in the numbers of abdominal segments (typically five in males, and seven in females), or in some species, noticeably different colors or appearances between sexes, such as longer and thicker antennae in males, broader or narrower heads, thoraxes, or carapaces, and/or the length of the wings (with males having longer, or more well developed wings for flight than females). Females of some species also do not fly, or much more rarely do, than the males.

**Figure 3. Comparison of number of abdominal segments in male (left), and female (right) Mantids. Credited to Mantids & More.*

 *Figure 4. Example of drastic sexual dimorphism in size and appearance between male (top) and female (bottom) Orchid Mantis.*

-Terrestrial or Semi-Aquatic Crabs. Sexing techniques for terrestrial and/or semi-aquatic species of crabs can vary considerably depending on the species and genera. Many can be sexually dimorphic in size, or have sexually dimorphic secondary sex characteristics such as larger claws in males (sometimes with one claw noticeably enlarged, as with fiddler crabs), while male's abdomens can also be comparatively smaller or thinner than those of females. In others, such as hermit crabs, the presence of gonopores in females, located underneath the first segment of the hind pair of walking legs near the cephalothorax and abdomen primarily determines the sex. Crabs which use shells, however, should not be forced out in order to do so, or any other reason.

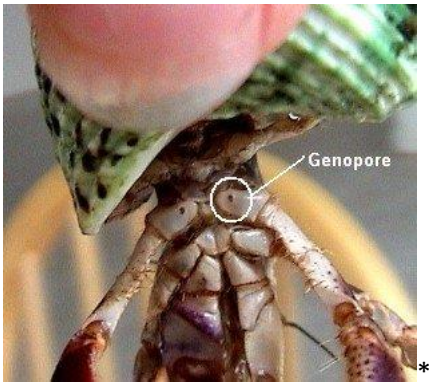

**Figure 5. Example and Location of the Genopores in Hermit Crabs*.

 *Figure 6. Noticeable sexual dimorphic differences between male (left) and female (right) Fiddler Crabs. Note the large, sexually dimorphic claw in males.*

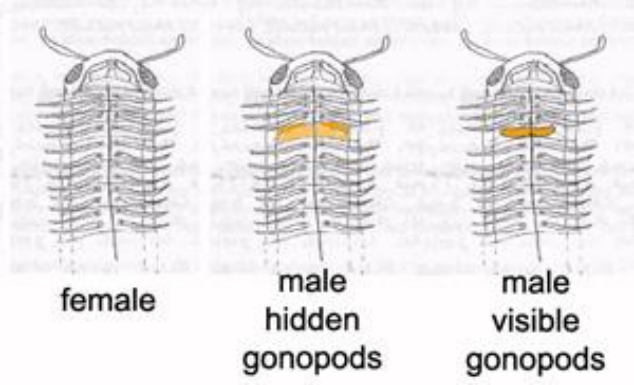

**Figure 7. Hidden and visible gonopods replacing one or more segments of legs on underside in male millipedes (center, and right), compared to females (left). Credited to Exotic.bg*

-Millipedes and Centipedes. Millipedes and centipedes can be difficult to sex unless a good look can be had at their ventral, or undersides. In some species, the seventh segments may be somewhat enlarged in males, while in others, examine where the gonads in males (which females lack) replace one or more segments of legs. In centipedes, examine the last several segments of the body, or the terminal legs and segments, which, for most species, are slightly thickened or enlarged in males than in females. Observing mating behaviors can also help determine the sex of a centipede. Centipedes may require anesthesia through CO2 in order to be able to be sexed, which should only be attempted by experienced individuals. "Popping", or everting the terminal reproductive organs, as described below for snakes, is also possible with centipedes.

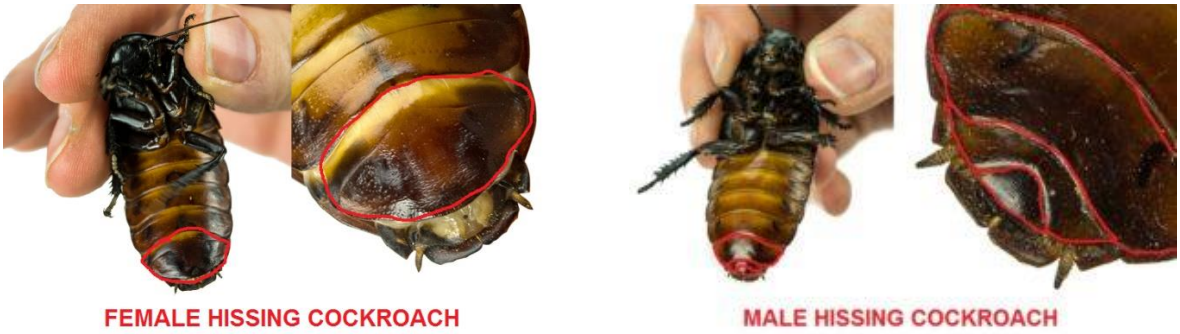

**Figure 8. The abdominal plates between female (left), and male (right) cockroaches. Credited to Josh's Frogs.*

-Cockroaches. Cockroaches, or "roaches" can be relatively easy to sex, depending on the species, and whether they are pet species or feeder species. Many can be sexually dimorphic in size, with females being larger than males. The simplest method is to examine the number of abdominal plates on the roach's underside, with males usually having three plates, while females usually have only a single plate. Some species, such as Madagascar hissing cockroaches, also have larger and more pronounced "knobs" or tubercles on the pro-thorax in males than on females.

Figure 9. Knobs, or tubercles on the pro-thorax of male (left), and female (right) Madagascar Hissing Cockroaches. Credited to Josh's Frogs.

-Assassin Bugs and Other "True" Bugs. Sexing of these bugs can be fairly simple, depending on the species. Look for the shape or tip of the underside of the abdomen, which are pointed and extend approximately 1 mm beyond the apex of the wings in females, or a blunter tip which does not extend beyond the wing apex in males.

Arachnids:

-Tarantulas and Other Spiders. Many species of tarantulas and other spiders can be sexually dimorphic in size, with females being much larger in size, and longer lived than males. Male tarantulas and other spiders can also have modified tibial hooks, or pedipalps on their legs used for mating and copulation. Sex can also sometimes be determined from the underside of molts or the abdomens, by determining the gaps between the booklungs (or other sexual organs), which are wider and not triangular in males, as they are in females. Finally, males can sometimes have larger or more additional spinnerets on the ends of the abdomen than do females.

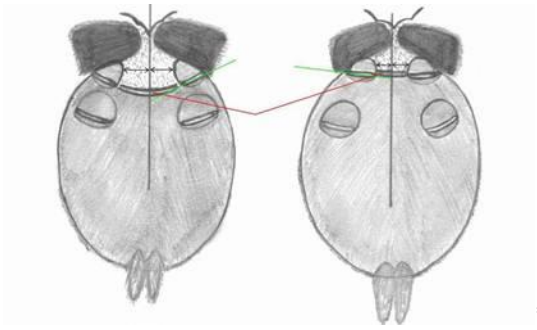
Figure 10. Abdominal views displaying the distance between booklungs in female (left), and male (right) Tarantulas. Credited to Mile High Bug Club.

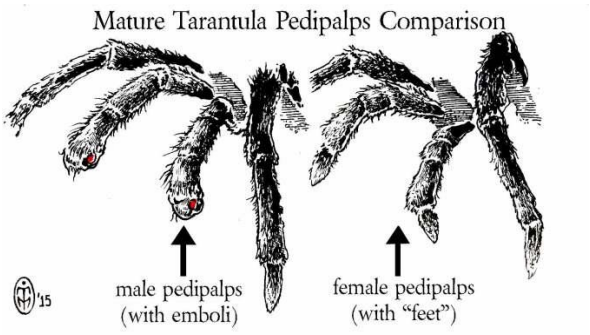

**Figure 11. Pedipalps comparison between male and female Tarantulas. Credited to Tom's Big Spiders Blog.*

-Scorpions and Other Arachnids. Many species of scorpions and other arachnids can be sexually dimorphic in size, with females being much larger in size, and potentially longer lived than males. Scorpions and other arachnids also have several other secondary anatomical differences as well, such as heavier or rougher chelae, or pedipalps, in males compared to females, a greater metasoma/telson to carapace ratio in males compared to females, and the most common means, larger or longer pectens on the underside of the carapace in males than females.

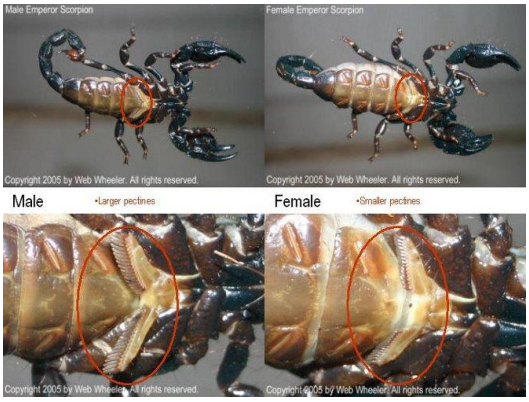

**Figure 12. Comparison of pectens on ventral side between male and female Scorpions. Credited to Web Wheeler.*

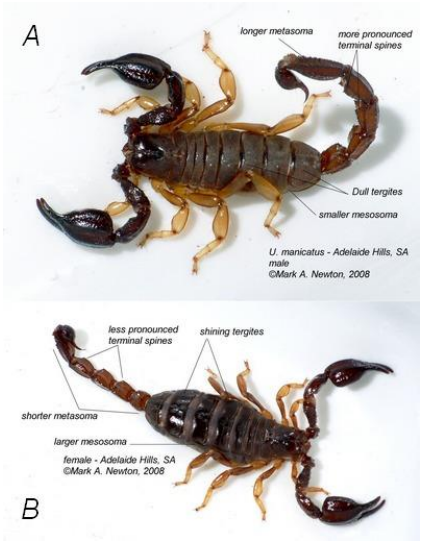

**Figure 13. Comparisons of the metastomas, mososomas, and*

tergites between male (A) and female (B) Scorpions. Credited to Mark A. Newton.