This was originally prepared to present to the El Camino Real Chapter of Texas Master Naturalists in July, 2021. I wanted to share my difficulties identifying wolf spiders on my property and the unexpected conclusions I eventually reached. Of course, everything that follows is subject to correction or reinterpretation, but I believe it is largely reasonable, and there will always be something new to learn regardless. Already I've had to describe a further developmental stage that occurs soon after the spiders reach adulthood.

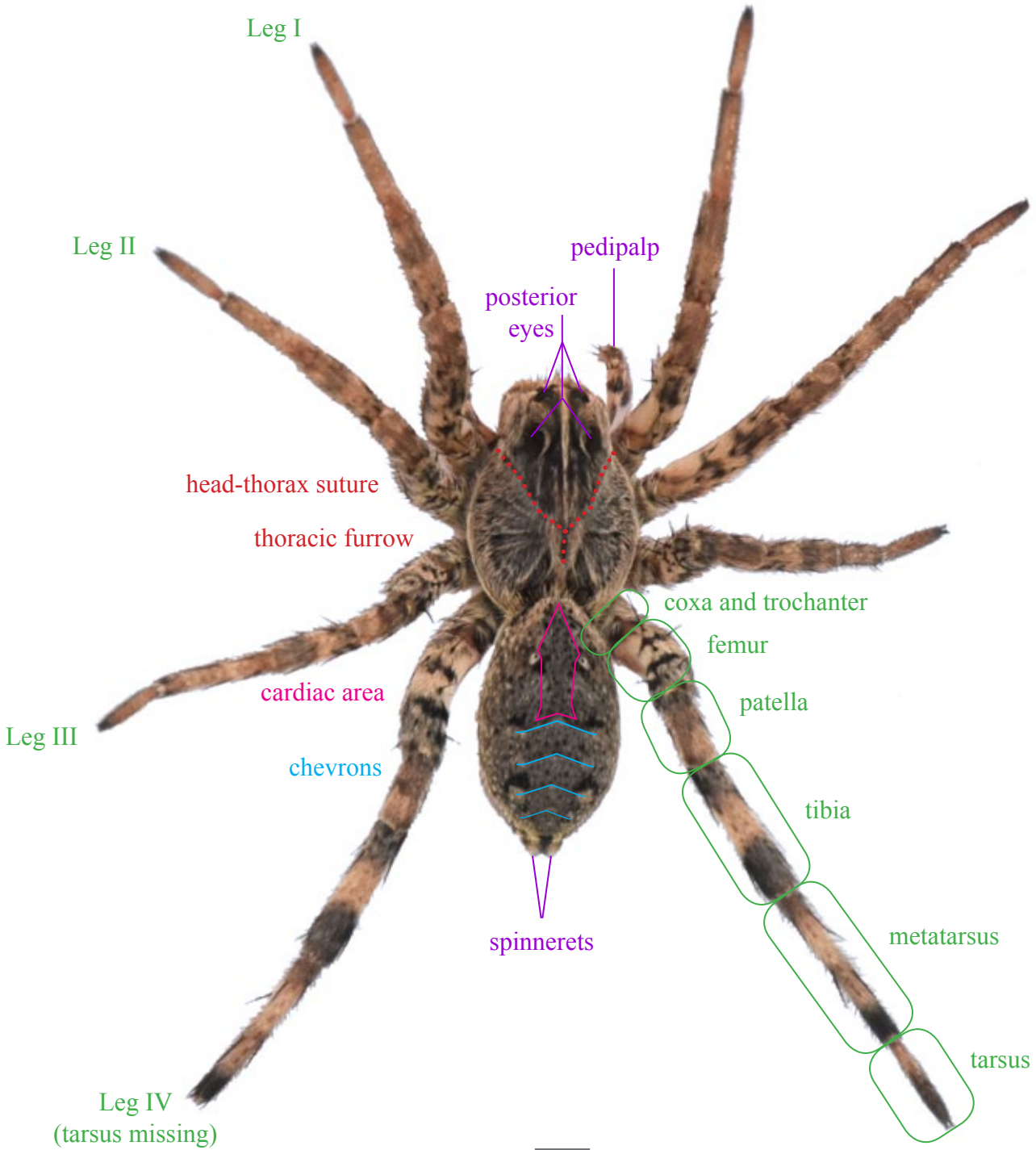
Eric Neubauer, updated August, 2021.

Hogna antelucana meets Hogna ‘incognita’

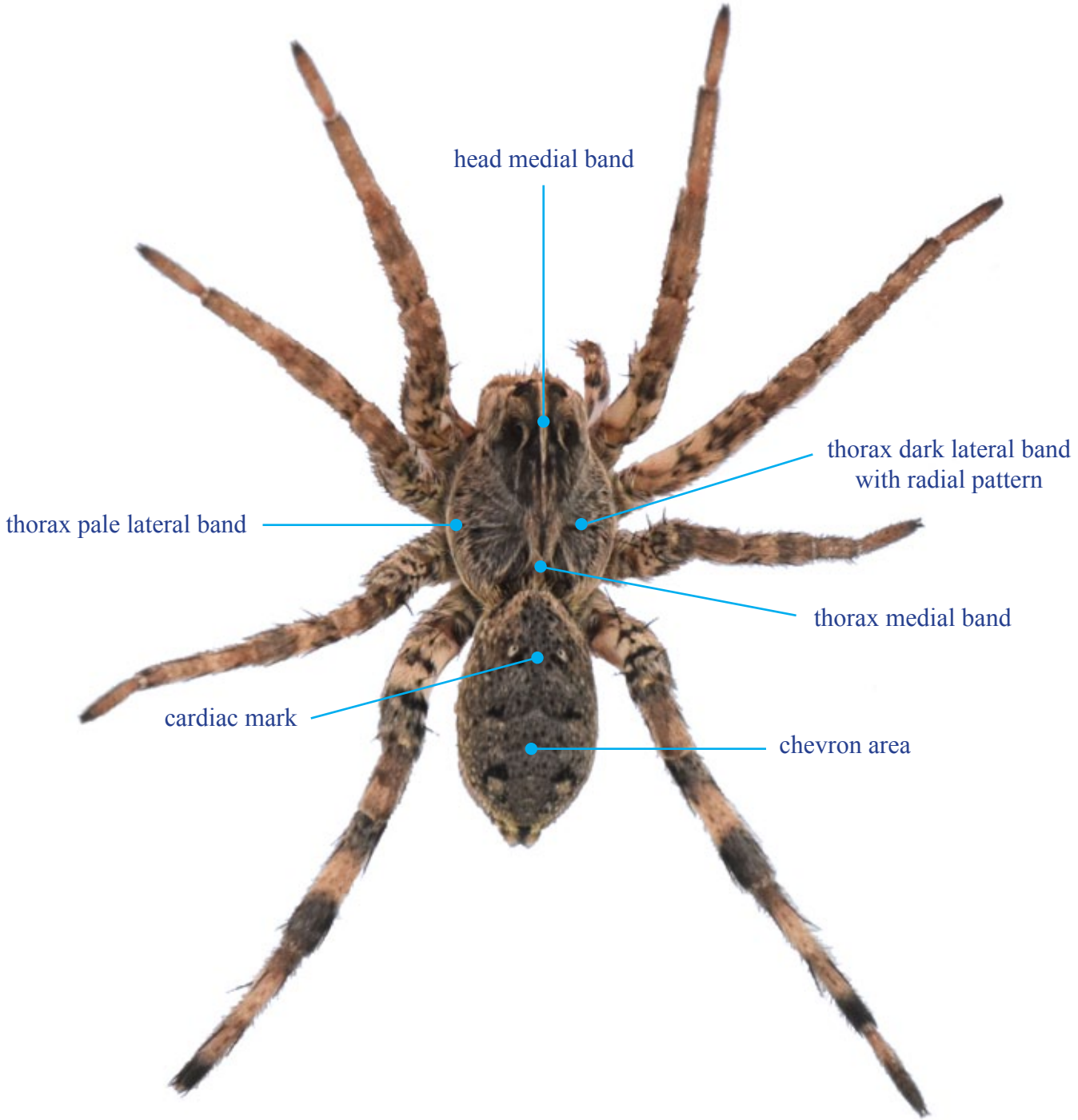
Hiding in plain sight: An overlooked species recognized at last.

Surely it was around when the first specimen of Hogna antelucana was collected in Austin, TX, and described in 1904. Observations of it from Austin are easy enough to find at iNaturalist today. Surely scientists collected specimens of it, but apparently preserved specimens couldn’t be distinguished from Hogna antelucana or some other species in the lab. I was fortunate that my property had both species in large numbers. After struggling to identify my spiders for months, I concluded that some didn’t look like the rest. I considered sexual dimorphism, but soon ruled that out and became convinced I had two species. I finally figured out which one was Hogna antelucana, but the other didn’t match any known species. I studied the juveniles of both species as they developed this spring and found dramatic differences to support my convictions, and learned how to identify juveniles of both species as easily as adults.

Anatomy terms used in descriptions



Areas of visual interest



H. antelucana adult identification

The head medial band becomes wider to the back. A single pair of lateral stripes stay fairly close to medial band.

The thorax medial band is slightly wider than the head medial band and contains a thin, dark "Y".

The radial pattern appears to contain several dark petals with pale edges.

The cardiac mark is darker than the surrounding area, and the rear third is flanked by two large pale areas.

The first 3 chevrons terminate in large, pale patches. The other chevrons terminate in much smaller pale patches.

H. ‘incognita’ adult identification

The head medial band is constant in width and becomes fainter toward the back. The outer of two pairs of lateral stripes, faint on this individual, goes out at a 45 degree angle before returning parallel to the head-thorax suture.

The thorax medial band forms a “V” shape. The straight outside edges form a 40 degree angle.

Parts of the radial pattern look like petals with one or more dark ribs. Two rather dark triangles flank the thorax medial band at the back.

The cardiac mark is nearly invisible except for some dark marks around the edges.

The first and third chevrons terminate in pale patches which are equally large although the contrast of the rear pair is greater. The second chevron ends in smaller pale patches with less contrast.

Which one is H. ‘incognita’?

Which one is H. ‘incognita’?

Which one is H. ‘incognita’?

Which one is H. ‘incognita’?

Which one is H. ‘incognita’?

Which one is H. ‘incognita’?

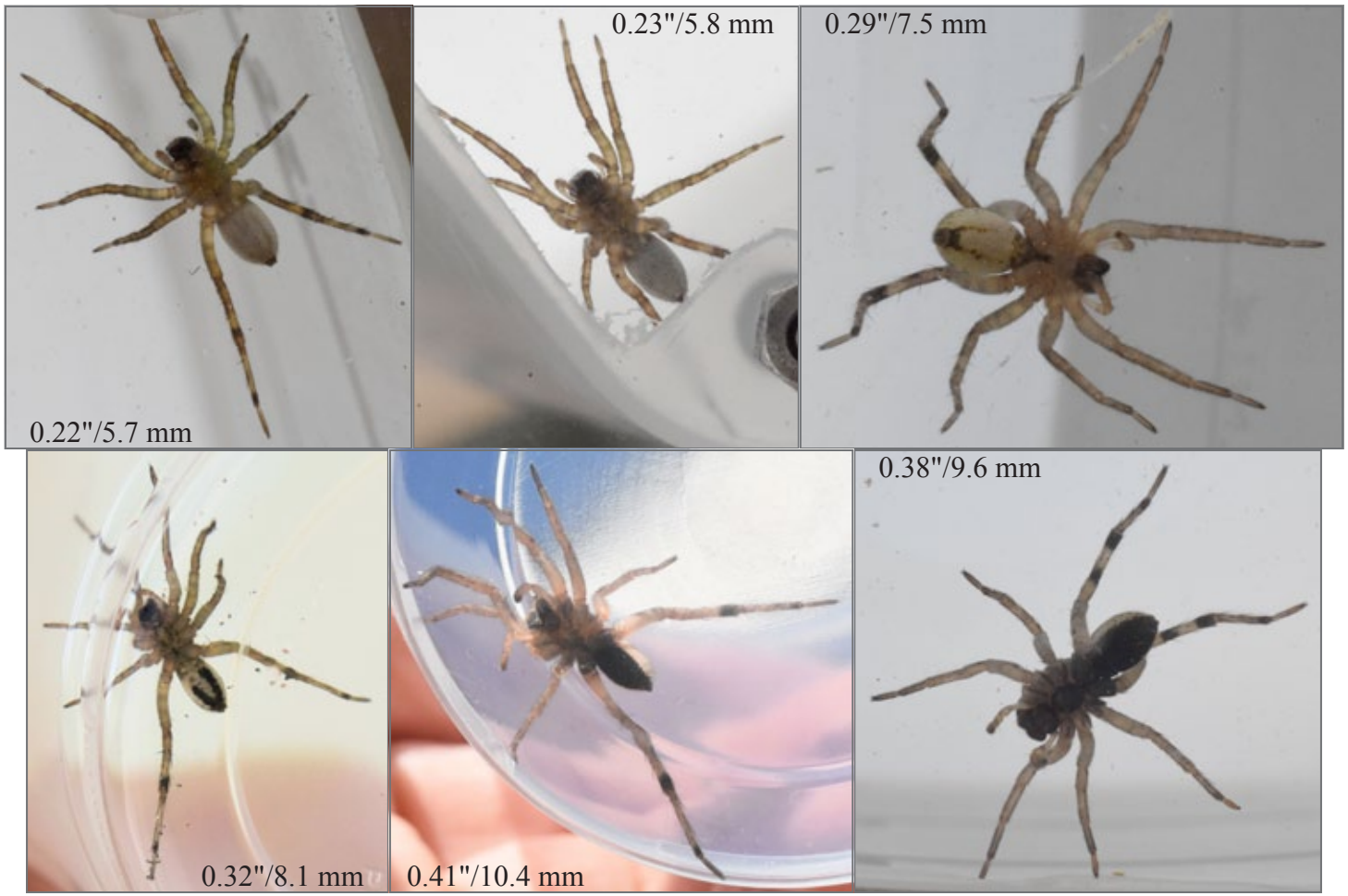
H. antelucana juvenile identification (dorsal)

The carapace medial band is initially quite wide and encloses a pair of short dark stripes. The edge of the band later separates as a stripe with a distinctive shape and may be broken in two.

The thorax pale lateral bands initially contain a series of three dark spots. A thin, dark submarginal stripe appears even with the outside edge of the spots. The dark markings eventually form a row of indistinct patches.

Very young juveniles have a grayness around the femora and the patellae. All legs are faintly banded at first, but this soon disappears on legs I and II, and then leg III. A few dark irregular blotches remain on the femora. On older juveniles, the only bands are on tibiae IV (1 or 2) and metatarsi IV (1), and encircle the leg. The one at the proximal end of the tibia is the last to appear. These bands are much darker ventrally.

H. antelucana juvenile identification (ventral)



Juveniles are very pale underneath, even white, throughout most of their development. As they approach adulthood, the bottom of the venter becomes entirely black starting at the spinnerets which are black, and moving forward along the edges at first. Eventually the sternum, and later the underside of the coxae, also become black. The sides of the abdomen remain pale into adulthood.

The legs of young juveniles are unmarked underneath except for faint bands at the distal ends of tibiae IV and metatarsus IV. As adulthood approaches these darken significantly on the ventral side, and a third band appears at the proximal end of tibia IV.

H. ‘incognita’ juvenile identification (dorsal)

The head medial band includes five pale stripes which form a lyre shape on younger juveniles. The thorax medial band is in a vee shape with a short pedicel. The top of the vee is flared out on young juveniles, but not on older juveniles.

Early juveniles have black-edged pale patches at the ends of the third abdominal chevron and are augmented by similar patches at the ends of the first chevron as the juvenile becomes older.

Young juveniles have distinctly banded legs. Legs I, II, and III are primarily banded on the dorsal side only. As juveniles mature, most of the banding disappears leaving only irregular blotches on top of the femora I, II, and III. Although some of the bands on leg IV fade way, four become wider and encircle leg IV right up to maturity.

H. ‘incognita’ juvenile identification (ventral)

Although juveniles probably start out pale, the venter and sternum turn mostly dark very early in their development. Darkening continues and spreads to include the underside of the coxae. The upper sides of the coxae and sides of the abdomen remain pale into adulthood.

The legs of young juveniles are faintly banded underneath. The bands gradually fade except on leg IV where they darken instead. Four bands remain as adulthood approaches and are located on the femur (distal end), tibia (both ends), and metatarsus (distal end).

Lessons learned

In order to satisfy amateur interest and make good use of internet resources like iNaturalist, identification keys using general views of wolf spiders are desperately needed. Most new species are discovered in the field because they look or behave differently. The primary purpose of laboratory examination is to confirm or question an identification and to provide perspective. Genetic testing is viewed as the ultimate authority.

General views from various angles are important, and certain details may be needed depending on the specific species. A direct dorsal view is a good starting place. Getting the spider to run into an open container helps control the situation, and the spider can be released afterwards unharmed. Juveniles and some species are small enough to make a macro lens a good idea.

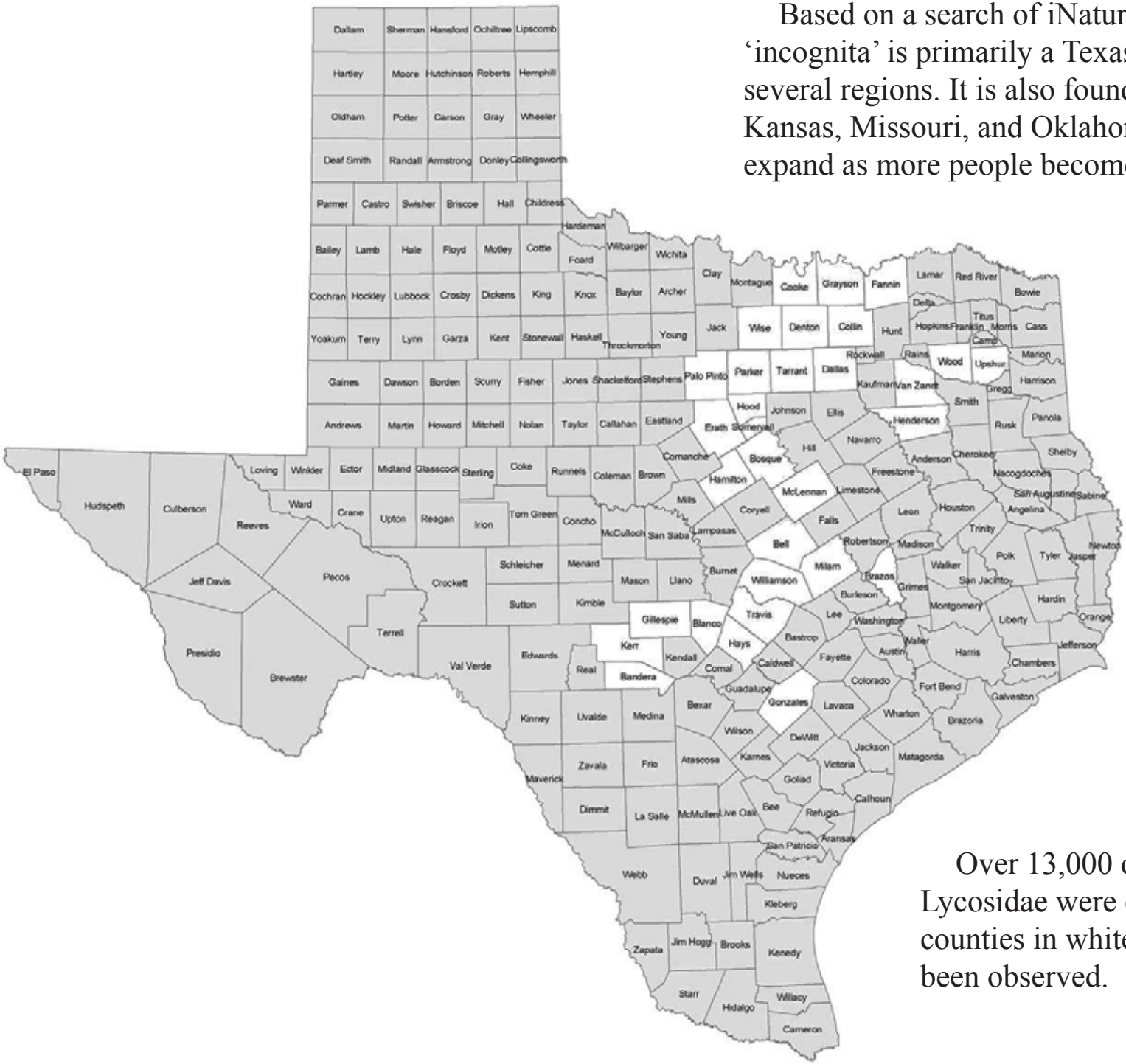
Species need to be studied as populations to develop a knowledge of individual variation and to associate males with females particularly when there is a lot of sexual dimorphism. The scientific literature often says one sex or the other is indistinguishable from related species. I don't necessarily believe that, but unless multiple members the unidentifiable sex are associated with the sex that can be identified, nothing will improve.

Juveniles are worth paying attention to. They are distinctive, numerous, and forecast what adults may appear later. In the case of antelucana versus. incognita, juveniles provided some of the strongest evidence of them being different species.

Most iNaturalist observations in Texas come from a small number of counties. County level distribution maps would be a big help with identifications, but there are insufficient rural data to make complete maps. Hogna antelucana can probably be found all over Texas, yet over half the observations are from high population areas along the I-35 corridor. There are no observations at all in over half the counties. Oddly enough, a third are from rural Milam County but that would be entirely my own fault and a statistical aberration.

H. ‘incognita’ range

Based on a search of iNaturalist observations, H. ‘incognita’ is primarily a Texas species found across several regions. It is also found in Arkansas, Louisiana, Kansas, Missouri, and Oklahoma. The range is likely to expand as more people become aware of it.



Over 13,000 observations of Texas Lycosidae were examined to show the counties in white where H. incognita has been observed.

Amy Kemper's big surprise

Above: When Amy uploaded an observation of a male spider from Tulsa County, OK, I commented that it looked a lot like Hogna 'incognita'. She kept the spider and it soon disappeared into a burrow. *Right:* When it emerged in early July, it had moulted and no longer looked like 'incognita' understandably causing me great consternation.

Eric Neubauer's big surpise

On July 12, I flushed a wolf spider, apparently a male, while pulling out Johnsongrass. It didn't look like anything I'd previously found on my property in Milam County, TX, but it did look a lot like Amy's spider did after moulting.

Conclusion: It was just an older Hogna 'incognita'. I had missed the later adult form because at this age they apparently became exclusively nocturnal and very furtive. That also explained why they had seemingly disappeared about this time last year.

I should add that the previous year I had observed a female with an egg sac in the pre-moult form, so there appear to be stages within adulthood.

Before and After in Texas

Unlike Amy's observation, these aren't the same individual, but they will do. Despite the many obvious differences, a couple of reliable characteristics remain the same.

- The outer stripe of the medial band on the head keeps the same shape and location and is noticeably different from antelucana, baltimoriana, and possibly another undescribed species down around San Antonio.
- The pale patches at the ends of the first three chevrons retain their relative shapes, specifically medium, small and large. These are large, large, and large on antelucana.