Figure 1. The rearing container.

A serendipitous rearing of *Belvosia argentifrons* Aldrich (Diptera: Tachinidae)

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In late September of 2020, a student brought me a huge caterpillar to show to my entomology class (Fig. 2a). I recognized it as the larva of the imperial moth, *Eacles imperialis* (Drury, 1773), a species of Saturniidae that is widely distributed in the eastern United States. He had found it in a bucket of water near the Northern Kentucky University Research and Education Field Station (REFS) located near Melbourne, Kentucky on the banks of the Ohio River (39°02′14″N 84°22′21″W, Fig. 2b). The area is covered with a fairly thick floodplain hardwood forest. Thinking that the caterpillar was dead, he placed it in a refrigerator for a day before dropping it off to me while I was teaching my class. After holding the caterpillar for a few minutes, the warmth of my hand brought it back to life, to the amazement of my class.

I have raised imperial moths for fun over the years, but the caterpillars were always bright green. This was the first time that I had seen one of the brown morphs of the caterpillars. Apparently, they come in a variety of colors from green to brown to burgundy. There was no obvious indication that the caterpillar was parasitized. I decided to raise the caterpillar and see if the brown caterpillar produced a different patterned adult than the green caterpillars I have raised in the past. I placed it in a large peanut butter jar (3 lb or 1.36 kg, Fig. 1) with dirt on the bottom and some dead leaves. I loosely placed the lid on the jar, which was a mistake. The caterpillar climbed up, pushed the lid off the jar and escaped into our dining room during the first night. My wife was very unhappy, but I found our little house guest, returned it to the jar and promised to not let it escape again. Within a couple of days, it had burrowed under the loose soil to pupate.

I placed the jar on a shelf in my garage in Cincinnati, OH so that it would stay near the temperature of the outdoors, but not too cold on the really cold winter days. I had hoped that it would emerge when other members of its species emerged to give it a chance to reproduce. The winter passed and no moth appeared. I thought that the moth had died but I did not throw the rearing container away. Then on 20 June 2021, I walked by the jar and movement caught my eye. It was not the imperial moth I expected. A large tachinid was sitting inside (Fig. 3a)!

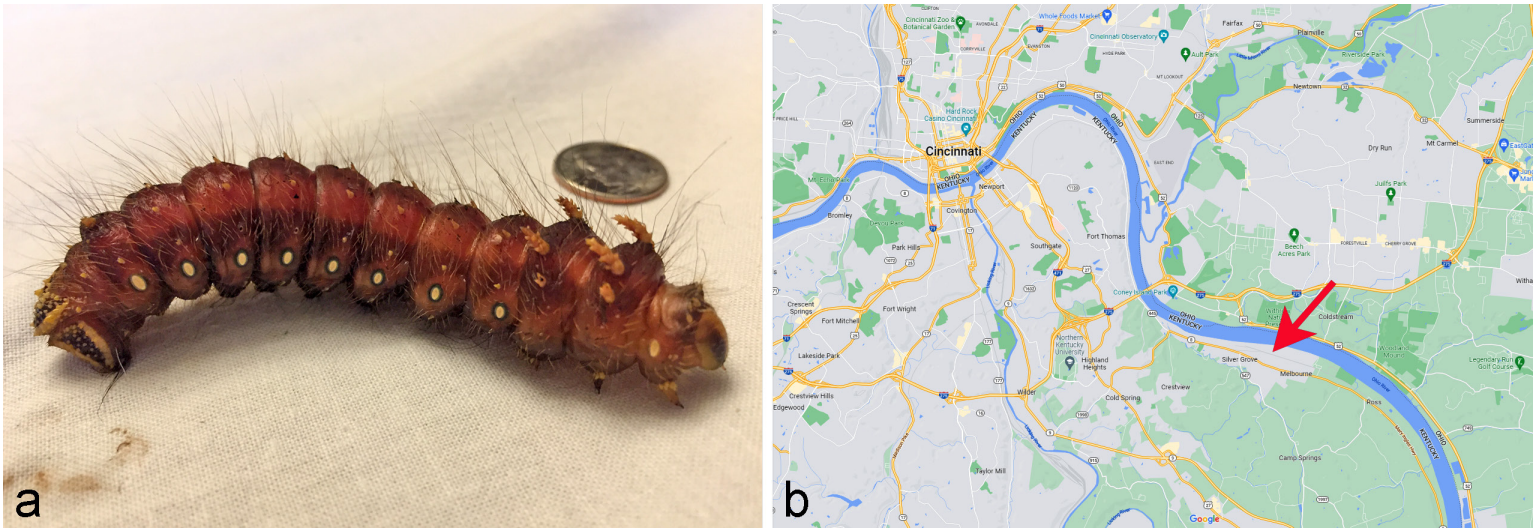

Figure 2. **a**. Parasitized imperial moth caterpillar with American quarter for scale. **b**. Google Maps© view of where caterpillar was collected (arrow) near Melbourne, Kentucky, USA.

When I emptied the jar, I found that five big *Belvosia* had emerged! I dissected the imperial moth pupa and found the five tachinid puparial casings (one in Fig. 4g–h) along with five more puparia that had not matured. I put the remaining puparia in a dry container just in case they were still alive, but I didn't have high hopes. All puparia were located in the thorax/head area of the pupa in a single mass. The flies all emerged from one hole on the side of the head area of the moth pupa (Fig. 3b–d). While the thorax was filled with puparia in a very thick matrix, the abdomen was empty of flies and was filled with fairly liquid and gooey abdominal remains. Within two days, three more adults emerged from the leftover puparia, although one was deformed (remaining teneral with wings that did not spread and the ptilinum expanded). The deformed one came out first. I thought maybe the other puparia needed a little more moisture, so I put them on a damp paper towel. Shortly after, there were two new (and perfectly formed) flies in the box. This serendipitous rearing yielded a total of 10 puparia. Eight flies emerged as adults and two did not. There were five males and three females (one shown in Fig. 4a–f).

I identified the adult flies as *Belvosia argentifrons* Aldrich using the key provided in Aldrich's (1928) revision. What started out as a half-hearted rearing of a moth turned into an unexpected adventure in fly rearing. This appears to be a new host record for this beautiful fly. There is one previous record of it being reared from a regal moth, *Citheronia regalis* (Fabricius) (Saturniidae), in Florida (Peigler 1996).

References

Aldrich, J.M. (1928) A revision of the American parasitic flies belonging to the genus *Belvosia*. *Proceedings of the United States National Museum*, 73 (No. 2729) [1929], 1–45.

Peigler, R.S. (1996) Catalog of parasitoids of Saturniidae of the world. *Journal of Research on the Lepidoptera*, 33 [1994]: 1–121.

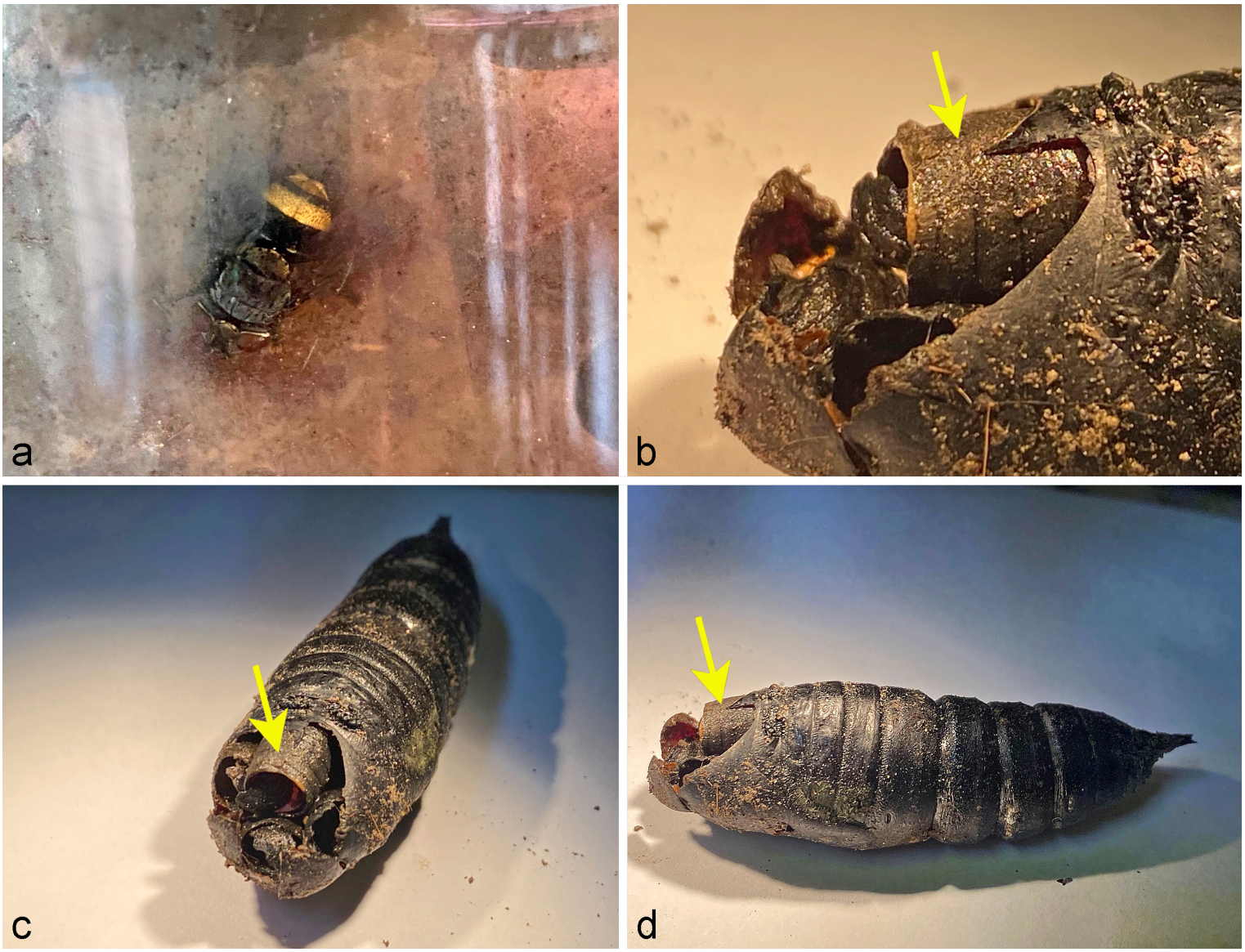

Figure 3. **a**. An adult *Belvosia* on a leaf inside the rearing container. **b–d**. Imperial moth pupa with an empty *Belvosia* puparium (arrow) visible at the front end.

Figure 4. One of the *Belvosia argentifrons* females and a puparium. **a**. Left lateral view of head and thorax. **b**. Left lateral view of thorax and abdomen. **c**. Frontal view of head. **d**. Dorsal view of head and thorax. **e–f**. Dorsal views of abdomen showing distinctive golden banding. **g**. Posterior view of puparium. **h**. Anterior view of puparium.