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Advocating For The Reclassification Of The *Eutreptosoma* Species Complex

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Abstract

After having received multiple sample specimens of occlupanids for our collection, five specimens did not resemble, in body morphology, that of any previously described species or subspecies according to HORG[1]. At first, we assumed upon initial review, that they were new subspecies of *Eutreptosoma arcuatis*, a Toxodentid species. Our collection so far includes all three described *E. arcuatis* subspecies: *agriscuta, citrops,* and *immanidiscus.* If these five specimens were indeed new *E. arcuatis* subspecies, that would be a significant discovery, however, upon further review of the specimens, we have decided to propose a new species be described in the genus *Eutreptosoma*. Additionally, one specimen in particular had specific oral groove morphology which made potential classification a more difficult process, leading us to decide that it should potentially be classified in a family separate from Toxodentidae.

1. Background

On Wednesday, September 10th, We received a package from a corporate facility in Minnesota. This package contained an envelope which had in it a diversity of occlupanids. Along with that folder this package contained a bag containing several more unique specimens that differ from any specimens described by HORG. Among that bag we found 3 subspecies of *Eutreptosoma arcuatis*; *E. arcuatis* subspecies: *agriscuta, citrops,* and *immanidiscus*. Our Specimens of *E. arcuatis citrops, and immanidiscus* vary from that of the HORG holotype and appear to represent different color morphs. The biggest find from this package were 5 new specimens that do not appear in the HORG database. At first glance one might think they simply represent new subspecies of *Eutreptosoma arcuatis* but we would

like to propose that they be separated into 3 new species, which contains 4 new subspecies. This paper will go into depth about the morphology of these new species, our research into these species and our proposed reclassification of the existing taxonomy.

2. Morphological Review

Regarding specimens #1 - #4, their morphology is also highly distinct, though their oral grooves are more confidently identifiable as that of *E. arcuatis* relation. Slight differences do exist in the features of the oral grooves between each other and between the specimens and the other *E. arcuatis* subspecies, and discourse over whether those minor differences warrant them being described as separate species rather than as subspecies is another goal of our research currently. Specimen #1 has a body form strikingly similar to the genus *Toroidopanis*, an Acutignathid[2]. The similarity derives from its wavy outer edge resembling the form of a curly bracket ({}), though enough differences with just the body shape and size alone exist to not connect this specimen to that family, let alone the oral groove. Specimen #2 has a body form resembling that of a heart-symbol (♡), which tapers at the distal end of the body. Specimen #3 has a body form resembling a clove of garlic, with the base of the clove at the distal end of the body. We believe that #3, similarly to *E. arcuatis citrops*, is displaying an advanced form of mimicry, strongly resembling the appearance and form of its host which it parasitizes. Finally, specimen #4 has the body form of a pink ribbon, most commonly associated with breast cancer awareness, which the markings on the specimen confirm. The angular "X" shape is very unique and striking for an occlupanid, possibly meant as a visual warning to ward off predators with its aggressive appearance.

Specimen #5 is a very curious individual, given its striking similarity to *E. arcuatis immanidiscus*, though what sets it apart fundamentally is the shape of its oral groove. While *immanidiscus* is undoubtedly a Toxodentid given the shape of its oral groove, #5 is not. Specifically, the distal (or second) oral furrow (we will call this the 'pallette') of the oral groove is wider and flatter, and forms more prominent lateral chambers behind the dental processes. The proximal (or first) oral furrows (we will call this the 'cheeks' of the oral groove) are more hemispherical than in Toxodentids, which have 'cheek' shapes more like that of the basal lobes of a *spade* (♤), angling downwards and beyond the oral hooks, while sloping inwards at the base of the dental process. As seen in fig. 2, the oral groove of #5 is comparatively very distinct from that of *immanidiscus*. Furthermore, the oral groove morphology is quite curious in its asymmetry, something unheard of in occlupanid oral grooves. The sinistal cheek clearly protrudes further and more prominently than the dextral cheek. Either resulting from a mutation in this particular specimen, or is a morphological feature of its species as a whole, further research into this asymmetry is definitely warranted regarding #5.

When pursuing a possible classification for #5 based on oral groove morphology, the only similar described group to exhibit similarly hemispherical oral cheeks and widened pallette is Mycognathidae[3]. This similarity is very rough, however, and the possibility of describing a new species of Mycognathid would be groundbreaking, as the family is described currently by only one species, known by only a singular specimen. In the realm of Mycognathids, research is very limited, and thus new knowledge regarding the family is highly valuable.

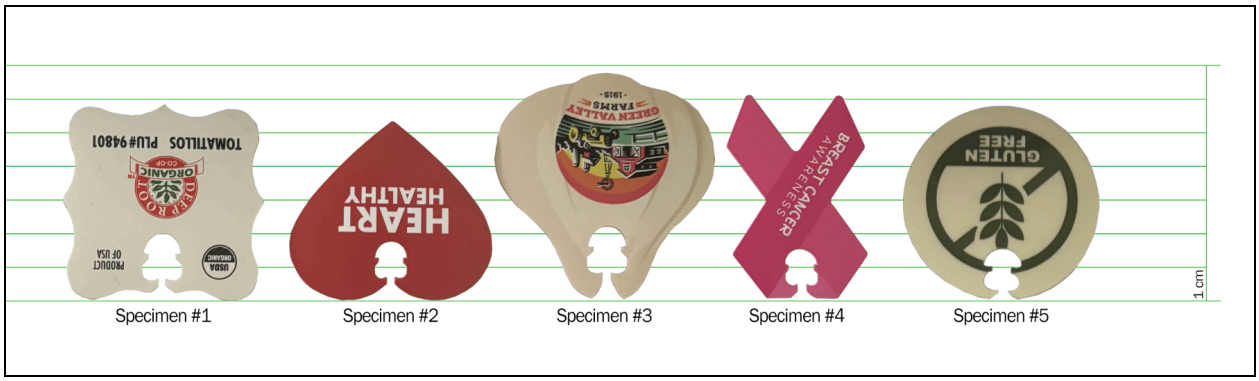

Fig. 1

Fig. 2

3. Taxonomic Considerations

When considering new taxonomy for the specimens, as well as *E. arcuatis* in general, we have decided that *Eutreptosoma* as a genus should really be broken into two species rather than one. Currently, the only member of the genus is *E. arcuatis*, but having all of the specimens side-by-side, excluding specimen #5, they all share one of two common morphologies: oral groove size. For those specimens which have a larger oral groove, all of nearly identical dimensions to each other's, they will remain as members of the species *E. arcuatis*. For those with smaller oral grooves, we recommend their classification as members of the new species *E. arcuatiparvorvis*, latin for roughly "small mouthed bow-shape". Within this species, we have identified four subspecies: *E. arcuatiparvorvis immanidiscus* and *E. arcuatiparvorvis agriscuta* are two currently classified as subspecies of *E. arcuatis*, but better fit in the new species based on oral groove size. Furthermore, specimen #2 will be named *E. arcuatiparvorvis cordatum*, from the latin "heart-shaped", and specimen #4 will be named *E. arcuatiparvorvis vittansum*, latin for roughly "ribbon loop". The other subspecies currently identified, *E. arcuatis citrops*, will remain as a subspecies of *E. arcuatis*, and will be joined by two new subspecies: specimen #1, which will be named *E. arcuatis crispusartus*, latin for roughly "curly frame", and specimen #3, which will be named *E. arcuatis allioformis*, latin for "garlic-shaped". In all, the new classification of genus *Eutreptosoma* can be described as shown in fig. 3.

Outside of genus *Eutreptosoma* is specimen #5, which we have decided does not belong to the family Toxodentidae based on its oral groove. As we mentioned in Morphology, #5's oral groove most

closely places it into the family Mycognathidae[3], a single-species, single-specimen family. Currently described in the family is *Lanciprendo rectangulus*, whose second oral furrow is much larger in size, especially in width, than its first oral furrows. While #5 also exhibits the same mushroom-like oral groove shape, the width of the first and second oral furrows are roughly equal, leading us to equate its shape to that of a King Bolete fungus[4], recognizable by its very wide stem. We recommend that specimen #5 be classified within, or is considered for relation to, the family Mycognathidae, and have decided for it a genus, *Boletoris* (latin for roughly "bolete mouth"), and its species name to be *orbiculosis* (latin roughly for "circular body"). The name thus reads as *Boletoris orbiculosis*.

Fig. 3

4. Conclusion

According to our review of the 5 new specimens we've acquired, we identified the need to redefine the *Eutreptosoma* genus, breaking *E. arcuatis* into two new species, and classifying a further 4 members of the genus as subspecies. Having defined the new species, *E. arcuatiparvorvis*, as well as a potential new member of the family Mycognathidae, the following species and subspecies are, as we hope to have accurately concluded, *E. arcuatiparvorvis immanidiscus, E. arcuatiparvorvis agriscuta, E. arcuatiparvorvis vittansum, E. arcuatiparvorvis cordatum, E. arcuatis crispusartus, E. arcuatis citrops, E. arcuatis allioformis,* and *Boletoris orbiculosis*. Notwithstanding other previous names created for the same specimens we have decided above, we believe that further review of our research presented here could greatly benefit the recorded understanding of the highly unique and fascinating *Eutreptosoma* species complex.

5. Acknowledgements

We at GRASTORC would like to thank M. Rutledge for allowing us to describe and publish on species that they originally discovered in January of 2024.

6. References

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