Small Bones, Big Questions: *Sex Estimation in Juvenile Skeletons*

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BACKGROUND:

- Along with age-at-death, biological affinity and stature, sex estimation is of paramount importance when assessing the biological profile of an unknown individual.
- Sex estimation methods within juveniles are well researched, but the accuracies are low as the sexually dimorphic features are not well defined prior to adolescence.
- **This study examines the accuracy and replicability of the juvenile sex estimation method utilizing the auricular surface (figure 1 and 2) proposed by Luna et al. (2017), which reports accuracy rates above 76%, to determine whether similar results can be consistently reproduced by independent experts.**

MATERIALS AND METHODS:

- Eight individuals of known sex (3 females, 5 males) and age-at-death (birth to 6 years) from the identified Lisbon Skeletal Collection (Portugal).
- Three morphological traits were evaluated (Figure 3):
  1. Overall Morphology (OM): shape of the structure (female: inverted L; male: V)
  2. MRS: superior retroauricular margin (female: rounded; male: angular)
  3. Inflection (IN): edge definition (female: distinct; male: indistinct)
- Replicability was tested through assigning individuals to the morphological characteristics and comparing the results of test 1 and 2.

RESULTS:

- Low accuracy and replicability (Table 1)
- Not replicable because the accuracy varies from 12% to 35% between the two tests.
- The morphological methods proposed by Luna et al. (2017) have low replicability and low accuracies.

DISCUSSION:

- Testing sex estimation methods on different ages and populations are important since sexual dimorphism has global variation due to factors like nutrition, environment, and growth patterns.
- Replicability of methods is important for maintaining accuracy when methods are retested and used in the field

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The studied juvenile sex estimation method has **low replicability.**

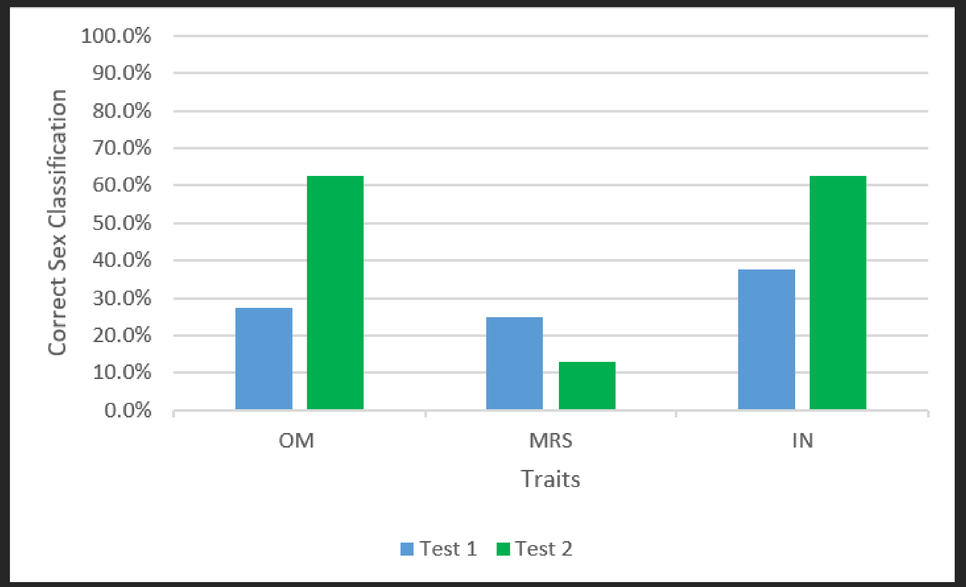

Table 1: Replicability of results. OM is overall morphology, MRS is Morphology of the Retroauricular End of the Superior Demiface, and IN is the inflection point

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Figure 1: Human pelvic girdle with the right and left auricular surfaces highlighted in red (from Wikimedia, 2015).

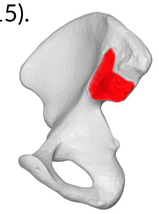

Figure 2: Human right os coxa with auricular surface highlighted in red (from Wikimedia, 2015).

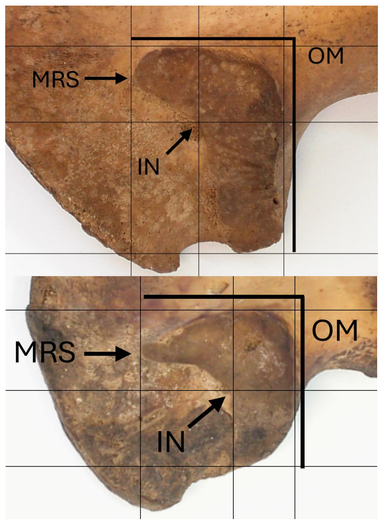

Figure 3: Female (top) and male (bottom) auricular surfaces illustrating the morphological traits under analysis.

REFERENCES

Luna, L. H., C. M. Aranda, and A. L. Santos. 2017. "New Method for Sex Prediction Using the Human Non-Adult Auricular Surface of the Ilium in the Collection of Identified Skeletons of the University of Coimbra." *International Journal of Osteoarchaeology* 27(5):898–911. doi:10.1002/oa.2604.
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