

INTRODUCTION

The standard Decomposition Scoring Systems (DSS) were created from studies predominantly conducted on individuals with pale skin, but they have not been applied in studies with predominately darker skin tone victims. This leaves a gap in knowledge on whether these DSS are suitable for darker skin tone bodies. To reduce this gap in knowledge, the effects of water conditions on the rate of decomposition have to be investigated. Also, in aquatic decomposition, DSS have been created to measure the extent of decomposition in human cadavers but barely any other study has tried to apply these scoring systems on small mammal human analogues.

AIMS

1. To investigate the effect of the water type such as seawater, freshwater, lakes, canals and ponds on the rate of decomposition.
2. To investigate the impact of water conditions like temperature, level of acidity and alkalinity, hardness and water depth on the decomposition rate.
3. To validate whether the Heaton *et al.* (2010) and van Daalen *et al.* (2017) aquatic decomposition scoring systems can be suitably applied to drowning cases from Africa or darker skin tone victims.
4. To determine if the DSS can be adapted (a-TADS scoring system) and be suitable for scoring the extent of decomposition in mice.

Due to the COVID outbreak, little work was done in the laboratory. Therefore, this poster focuses on only the fourth aim. A pilot study was conducted to test if the a-TADS system will be suitable for assessing the extent of decomposition in small mammal human analogues like mice.

METHODS

Materials

- ❖ 8 dead, frozen mice
- ❖ 3 10L boxes: Boxes 1 & 2 had 3 mice, while Box 3 had only 2 mice.
- ❖ Fishing weights: to keep each mouse fully immersed in the water
- ❖ Temperature data loggers

Measuring Decomposition

A mouse was removed from each box on days 5, 10 and 15 of submersion. Physical changes in the head (FADS), trunk (BADs) and limbs (LADS) of the mice were observed and scored. The a-TADS system used to score the level of decomposition in each mouse was adapted from the Heaton *et al.* (2010) and van Daalen *et al.* (2017) studies.

Accumulated Degree Days (ADD)

The ADD for the sampling days were calculated by adding up the average daily water temperatures for the days that made up the respective PMSI

RESULTS

Total Aquatic Decomposition Scores

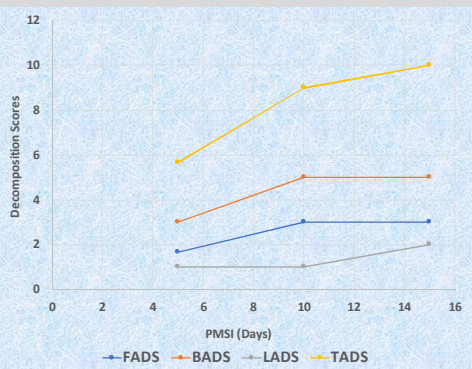


Figure 1: Average FADS, BADs, LADS & TADS for each sampling day.

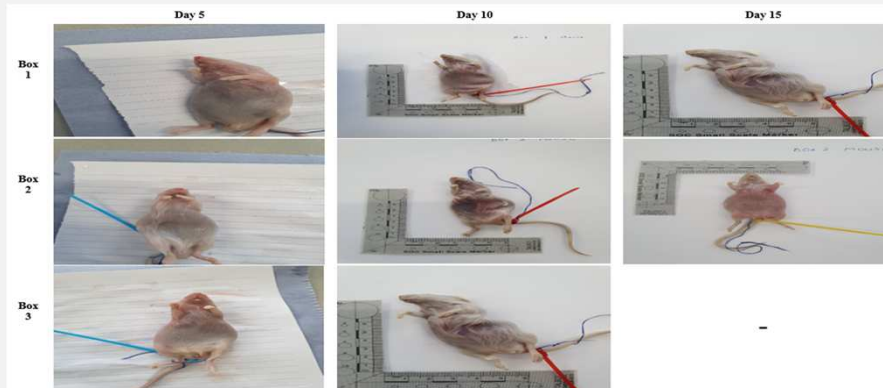


Figure 2: Pictures of the mice on PMSI Days 5, 10 and 15.

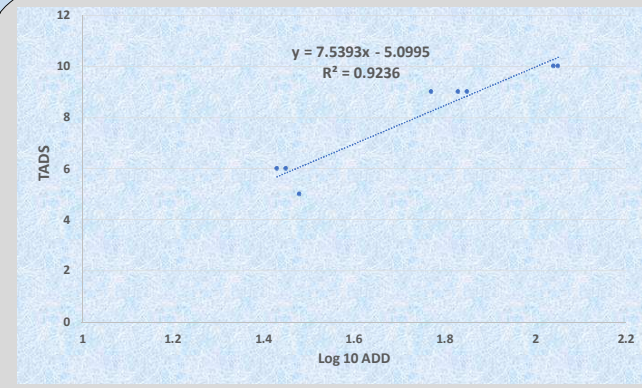


Figure 3: Graphical Illustration of the TADS against the Logarithmic ADD values.

DISCUSSION & CONCLUSION

It was easy to observe and score the physical changes of decomposition in the mice by following the descriptions laid down by the a-TADS scoring system. Therefore, it can be concluded that the a-TADS scoring system is suitable for measuring the extent of decomposition in small mammals (mice) used as human analogues.

REFERENCES

- Heaton, V., Lugden, A., Moffatt, C., & Simmons, T. (2010). Predicting the Postmortem Submersion Interval for Human Remains Recovered from U.K. Waterways. *Journal of Forensic Sciences*, 55(2), 302-307.
- van Daalen, M., de Kat, D., Oude Groenewegh, B., de laanuw, R., Houtman, J., Ooster, R., & M Duijts-Heesters, W. (2017). An Aquatic Decomposition Scoring Method to Potentially Predict the Post-mortem Submersion Interval of Bodies Recovered from the North Sea. *Journal of Forensic Sciences*, 62(2), 369-373.