



Decay of Skeletal Muscle Within Different Substrates

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Introduction

After a body is located, the first steps is to identify the remains and determine the circumstances of the death. The substrate in which the body is located will affect the rate of decomposition (Tibbet et al. 2004) and help determine the amount of time the body has been in that location. Tibbet el al. 2004 also reported that moisture is an important factor in decomposition rates because it increases microbial activity and therefore increases decomposition rate. The hypothesis of this decomposition study is that skeletal muscle of pig, *Sus scrofa domesticus*, in freshwater will have faster decomposition rates measured by significantly lower weights compared to other common Florida substrates, including brackish water, saltwater, Myakka soil, calcium carbonate sand, silica sand, asphalt, and the control (glass).

Materials and Methods

Thirty-two cubes of 2.5 g of *Sus scrofa domesticus* pork loin skeletal muscle were divided into 32 250-mL beakers. Four beakers were filled with each of the following treatments:

- 25 mL freshwater (0 ppt)
- 25 mL brackish water (15 ppt)
- 25 mL saltwater (35 ppt)
- 25 mL calcium carbonate sand
- 25 mL silica sand
- 25 mL Myakka soil
- 25 mL asphalt
- 25 mL glass (control)

Each sample of skeletal muscle was removed from the substrate and weighed daily for two weeks. At the end of two weeks, each sample of skeletal muscle was dried at 60 °C for 24 hours.

Weight of Decayed Skeletal Muscle

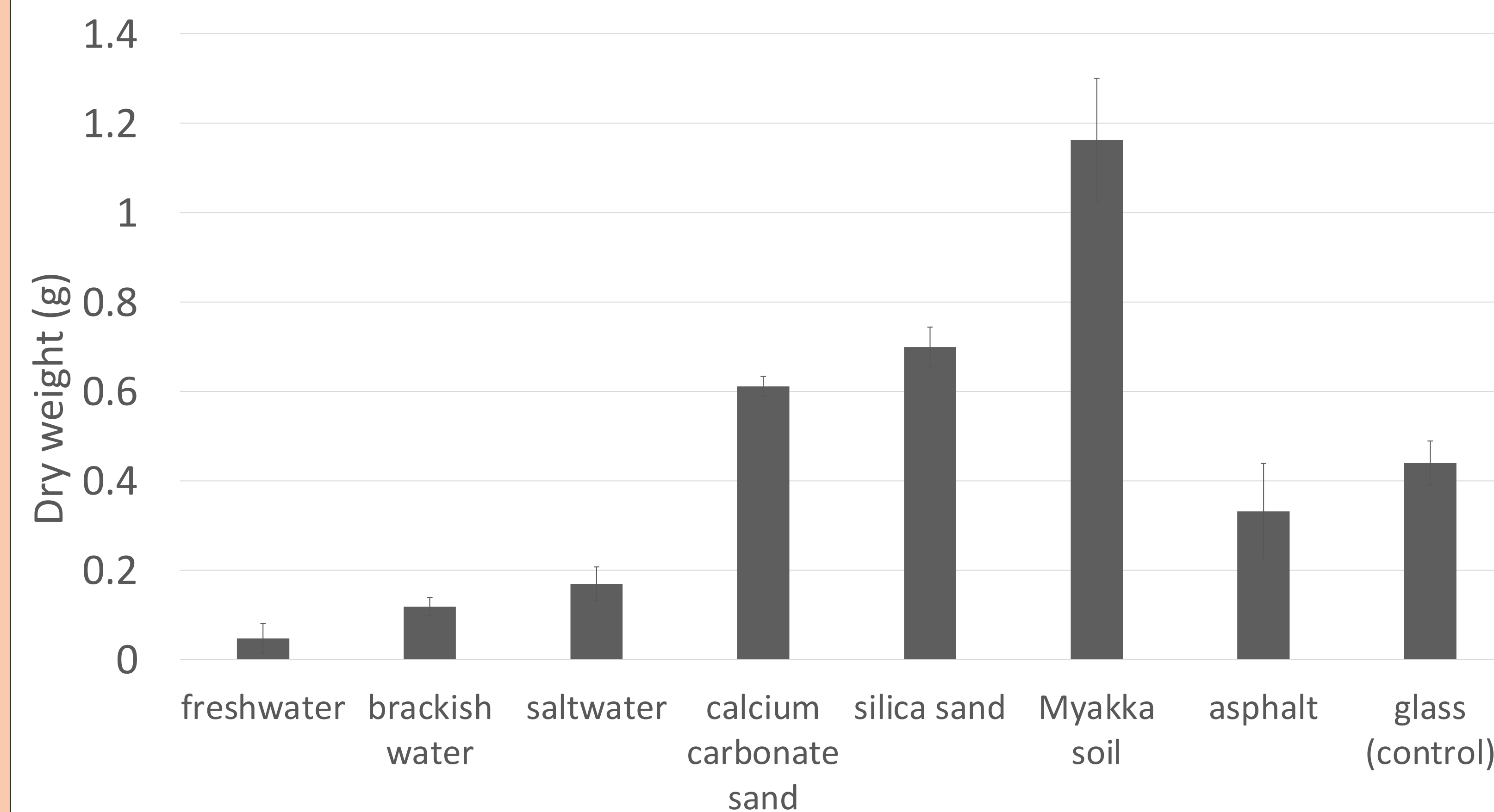


Figure 1. Dry weight (g) of skeletal muscle pork samples after 1 week of decay within different substrates (n=4, $\bar{x} \pm SD$).

Discussion

The data supports the hypothesis of this decomposition study that skeletal muscle of the pig, *Sus scrofa domesticus*, decomposing in freshwater has significantly lower weights compared to other common Florida substrates. Tibbet et al. (2004) concluded in their study that temperature influenced the samples which is something that, in the future, could be consider when retesting. The impact of this research shows that different substrates affect the rate of decomposition of skeletal muscle. Future iterations of this research may determine what component of Myakka soil was absorbed into the soil, possibly heavy metals, because the samples had significantly higher weights compared to the samples placed in other substrates.



Results

There were significant differences between the dry weights (g) of skeletal muscle samples after 1 week of decay within different substrates (1-way ANOVA $F_{7,24}=114.21$, $p<0.05$). The skeletal muscle samples in Myakka soil had significantly heavier dry weights than samples in other substrates and skeletal muscle samples in water substrates (freshwater, brackish water, and saltwater) had significantly lower dry weights than other substrates.



Literature Cited

Tibbett, M., Carter, D. O., Haslam, T., Major, R., & Haslam, R. (2004). A laboratory incubation method for determining the rate of microbiological degradation of skeletal muscle tissue in soil. *Journal of Forensic Science*, 49(3), JFS2003247-6.