What are the properties of insect lac and pine pitch and how do they compare? The use of adhesives for hafting tools and other purposes was used worldwide. Pine pitch was considered the primary adhesive used until a recent analysis showed insect lac to have been used by Hohokam, Mogollon, and Ancestral Puebloan people (Pool, Bulaia, 2016). Comparing the properties of pine pitch and insect lac shows how these adhesives could have been favored for different applications. Two tests were done to compare the two adhesives’ properties focusing on weathering effects and hafting strength.

Method for Making Pine Pitch

1. Deer droppings collected from a site near the start of the hunting process.
2. The resin was boiled until it was a viscous, tree gum.
3. Once the pine resin was boiled, it was mixed with bark and debris removed.
4. The pine pitch mixture was layered onto a stick making a “pitch stick” to store finished product for later use.

The strength test was done with a freshly hafted biface that was pulled off the haft along the notch using a ratcheting system to measure the pounds of force it took for the adhesive to fail.

Results + Observations

- Wood foreshafts were originally to be used but created a variable as it broke before the insect lac’s strength would fail.
- A metal railroad spike was used in place of wood. The pine pitch could stick well but the insect lac had trouble gripping onto the metal and stuck more to the bifaces as shown by the two tests with lower weight.
- The method for testing strength was successful but needed refinement to keep the scale and hafts stable for proper weight readings.

Questions

- What are the properties of insect lac and pine pitch and how do they compare?
- How do these adhesives factor into the archaeological record?

Problems Encountered

- Force to pull bifaces off its notch was higher than expected. Estimations prior to tests were 5 to 10 pounds.
- Lac was found to have the same strength as the pine pitch recipe used at haft with lac used at least 1 tea gram of lac than pine pitch.
- Although insect lac is harder to source in the present it requires less processing than pine pitch since only a heat source is needed to use lac for hafting.
- Lac may not be able to be heated multiple times causing it to become brittle.
- When heated lac retains heat longer than pine pitch and acts like rubber cement as it is a polymer.
- Pine pitch is more pliable and melts unlike lac which can hold up to being set in the sun better.
- Pine pitch to deteriorated at a faster rate than lac which was more resistant to the elements. Pine pitch recipe that was used for strength tests had deteriorated the most.

Future Work

- More tests should be done with different recipes of pine pitch as time and resources allowed for minimal tests. Develop a more reliable way to measure the strength of adhesives and its other properties.
- As well as looking into a wider range for the use of these adhesives in the archaeological record.

Reference + Acknowledgments


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