**The influence of lithification on Cenozoic marine biodiversity trends by Austin J. W. Hendy**

This article takes a look at the effect the degree of lithification of the sediments in a stratum can have on the diversity of fossils found. It was found that unlithified sediments yielded significantly higher abundance of genera than lithified sediments at the same sampling intensity. It was also noted that there are more occurrences in unlithified sediments likely due to the fact that it is much easier to separate the fossils from the matrix due to the fact that it is loose compared to lithified or cemented matrix. He also compared the size of taxa found in unlithified, poorly lithified, and lithified sediments and found that unlithified sediments yielded higher concentrations of small taxa than either poorly lithified or lithified sediments. These differences may be mostly concerned with the fossil extraction process. To obtain fossils from lithified sediments, large rocks must be broken, or slabs split to find the fossils contained within. For unlithified sediments, one may need to use a sieve and water to separate out the fossils from the matrix which can yield a better representation of the fossils present. Small fossils may also be destroyed in the process of trying to expose them in lithified sediments.

I like that this article considered one of the fundamental aspects of paleontology (the process of actually gathering the fossils) to describe trends in diversity observed in the fossil record. It seems so obvious now that the way fossils are collected or the matrix they are preserved in can have a massive impact on what actually gets collected and catalogued. The results seem to be very clear. This is also empirical evidence for why the fossil record is biased toward larger bodied taxa. The statistics for his tests came out very cleanly with p-values all less than 0.01.

There were several grammatical errors in the paper that really bothered because I am a bit of a stickler for that kind of thing. Many of these errors were so blatantly obvious that they should have been caught in the review, and they were distracting. I also feel like this study could be expanded. I am not sure whether or not the paleobiology database contains the proper information for this study, but if it does not it should. I also do not care for the arbitrary assignment of size to the taxa, although I do not know what could be done in place of that.

Figure 1 simply seems to be showing that the global diversity seems to correlate well with the percentage of collections found in unlithified and poorly lithified strata. This is also corroborated by the data from the New Zealand site that is presented in Figure 2. We can see from the first graph that hardness of the stratum is negatively correlated with the number of genera present. The second graph gives a more detailed view of which types of strata contain what abundances of genera. Table 1 shows the data well, but I feel like it should have been left in the supplementary documents just because there is not much there that was not already mentioned in the paper. Figures 3 and 4 show that there are a larger number of genera represented by a similar number of specimens in the unlithified strata as opposed to lithified strata, again, reiterating the main point of this paper. Although, I am not quite sure why there are two graphs. I think the only difference is that Figure 4 deals strictly with samples dominated by *Tawera.* I think Figure 5 was my favorite because we can clearly see the bias toward larger body size especially in the lithified collections. We can even see that the large-bodied taxa were better represented in the unlithified collections as well. Table 2 is similar to Table 1, and again, I feel like it could have been left in the supplementary documents, but I do think it is useful to the readers who are more interested in this subject to be able to see the results of his statistical tests all in one location.