

Diterpenic resins have been previously shown to have a common peak at around 395cm^{-1} (Prati, et al., 2011), which is present in sandarac, copal, and colophony. In the samples analyzed in this study, the literature peak positions for these mixtures, both copal and sandarac also have the characteristic peaks of polymerized communic acid at around 260cm^{-1} and 520cm^{-1} . In the samples that were analysed by far-IR, these peaks (260cm^{-1} and 520cm^{-1}) were also identified in colophony, however, in comparison to the literature peak distribution, the colophony sample analysis showed a larger range of distributed peaks, with major components corresponding to the literature values (Prati, et al., 2011). The data in the table identifies a higher number of peaks found in the samples in this study in comparison to the peaks identified in previous studies by (Prati, et al., 2011), which can be explained through variability between sources, as additives may interfere with the positioning of the peaks due to the transitions in the molecular structures of the exudate and could have overruling peaks due to inorganic additives as this is highly active in the far-IR region.

Dammar and sandarac both showed a peak at around 580cm^{-1} which is characteristic of triterpene compounds (Prati, et al., 2011), which showed similarities to the literature peak distribution for these for dammar but not for sandarac, however some of the characteristic peaks of dammar, which are shown in the literature, were not present in the analysis of the analyzed sample.

The analysis of the sample of mastic produced a spectrum containing a range of peaks with quite low changes in absorbance, which was vastly differing from the spectra found in literature (Prati, et al., 2011). This result could indicate that there is a smaller amount of organic compounds that give rise to vibrations that have observable absorptions in the far-infrared area and the speaks that are observed are background fluctuations. The mid-infrared is observed to have a dissimilar peak distribution in comparison to the literature, could be due to the product, which was purchased from an Art Supply retailer (Paint Box), being a larger percentage not the resin but something else, like filler compounds, making it an impure compound. To get a clearer indication, future experiments can analyze materials that are already in the literature, as process and handling and changes in production could influence the purity of material.

The mid-IR, however, correlated to literature spectra (Prati, et al., 2011). These results could be representative of the variance in chemical composition of artists' material, being sourced from different manufacturers. In general, artists would have sourced their material from different manufactures depending on viability of cost, availability, and preference and in analysis of artefacts this would have to be taken into consideration.

Prati, S., Sciutto, G., Mazzeo, R., Torri, C., Fabbri, D., 2011. Application of ATR-far-infrared spectroscopy to the analysis of natural resins, *Analytical and Bioanalytical Chemistry* 399, 3081-3091.