

THE CHEMISTRY OF MUMMIFICATION

Dressing up as a mummy for Halloween is easy; actually becoming one is a little more complicated. This graphic looks at the chemistry behind embalming.

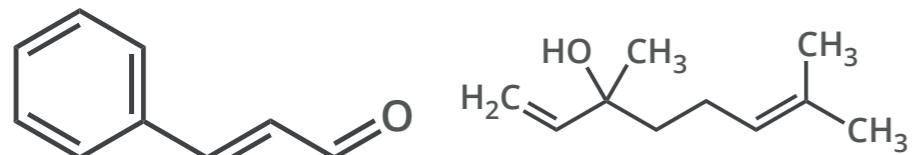
DRYING THE BODY



SODIUM CARBONATE SODIUM BICARBONATE SODIUM CHLORIDE SODIUM SULFATE

After the organs were removed, the empty cavities were stuffed with natron, a naturally occurring mixture of sodium carbonate and sodium bicarbonate, and small quantities of sodium chloride and sodium sulfate. This caused rapid desiccation of the body and saponification of fats, preventing decomposition.

FILLING BODY CAVITIES



CINNAMALDEHYDE

Present in cinnamon and cassia

LINALOOL

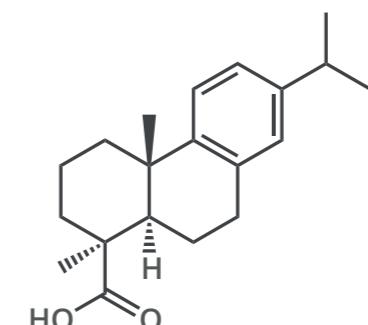
Present in cassia and mastic

After drying the body could be stuffed with a range of materials before embalming. Along with sawdust and linen, these included myrrh, cinnamon, frankincense, cassia, mastic resin, and even onions! Some of these substances contained compounds with antimicrobial activity that could aid the preservation of the body.



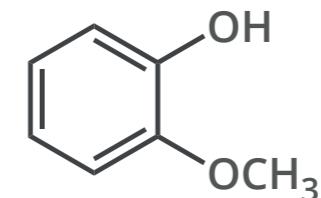
EMBALMING MATERIALS

Mummies were bandaged with linen, and after every layer oils, resins and balms were applied. Compounds found in mummy wrappings give hints as to some substances used, which included coniferous, cedar, and pistacia resins, beeswax, and bitumen. When dried, these materials formed a water-resistant seal.



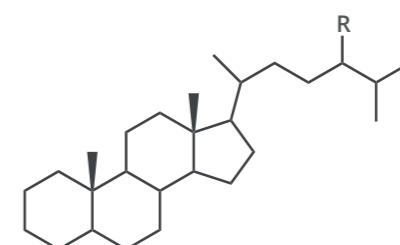
DEHYDROABIETIC ACID

Derivatives of abietic acid are common indicators of the use of coniferous resins in the embalming process.



GUAIACOL

Phenolic compounds found in some resins, such as cedar oil, have bactericidal effects and inhibit decomposition.



STERANE (GENERAL STRUCTURE)

Compounds called steranes and hopanes can show whether bitumen was used during embalming.

The use of bitumen is often linked to the black appearance of some mummies, but this can also be caused by resin degradation products.

