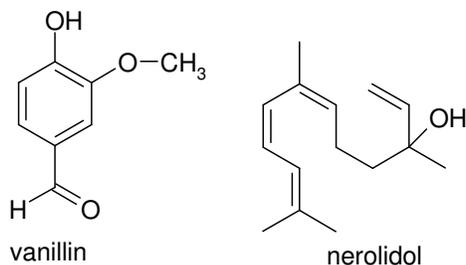
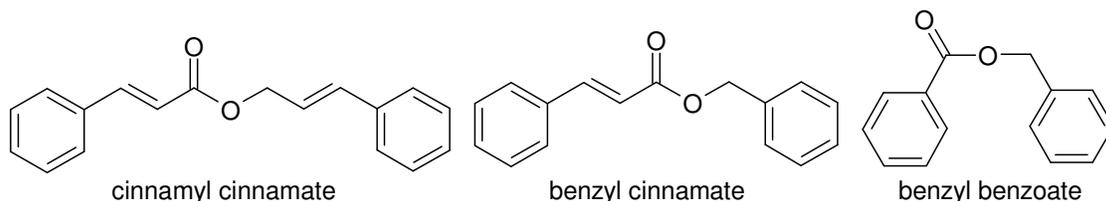




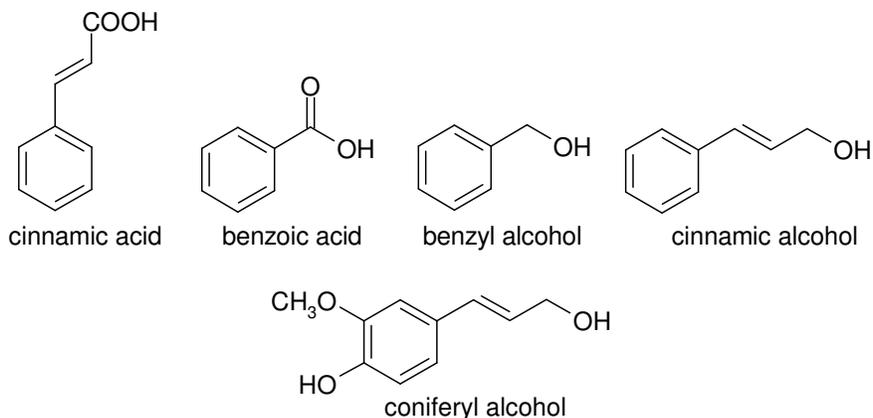
Brief Guide to Peru Balsam Chemistry.

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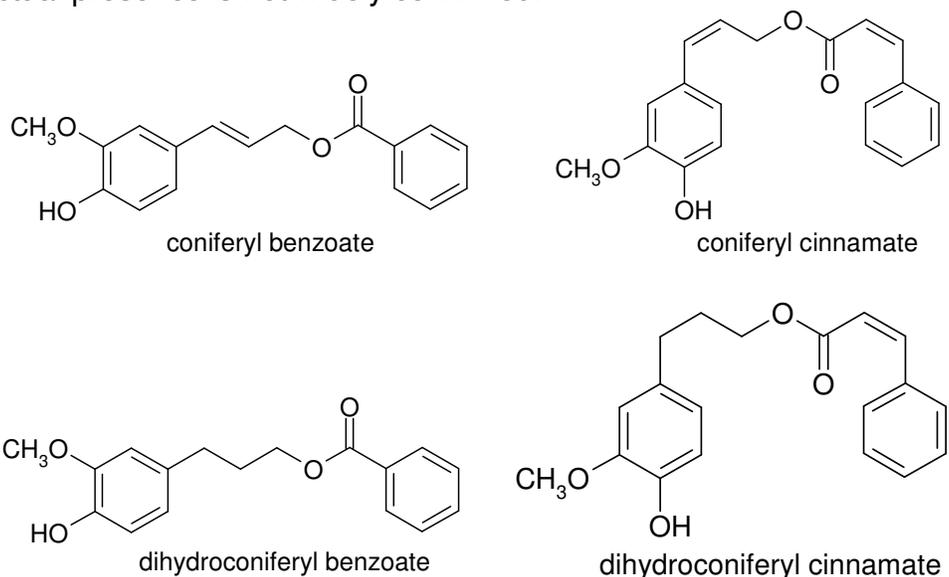
There is some variability in the composition of Peru Balsam exudate *Myroxylon pereirae* (Royle) Klotzsch (Fam. Fabaceae) [syn. *M. balsamum* L. (Harms) var. *pereirae* (Royale) Harms – as there is with any natural product – but especially with this commodity, since the familiar commercially available item is a result of the combination of materials from three separate processes in fixed ratios (see elsewhere for Peru Balsam's manufacturing details). The most frequently named constituent of the Peru balsam is arguably 'cinnamein', which is an older term for the naturally occurring balsamic (i.e. cinnamyl and benzoic) esters. The British Pharmacopoeia's 2007 monograph on Peru Balsam (equivalent to the European Pharmacopoeia monograph 0754) stipulates that the Balsam should contain from 45% to 70% of such esters. More specifically, the cinnamein esters are largely comprised of benzyl cinnamate (to 40%), benzyl benzoate (to 30%). & cinnamyl cinnamate (to 0.5%). Other constituents include the fragrantly scented vanillin (to 1%), and the sweet-floral scented sesquiterpene alcohol nerolidol (to 7%), the latter constituent being formerly termed 'peruviol'. The resin content is represented by the phenolic 'peruresinotannol' constituent is typically present at 20-40%, and is found combined with both bound & free cinnamic & benzoic acid moieties. .

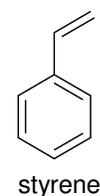
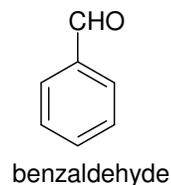
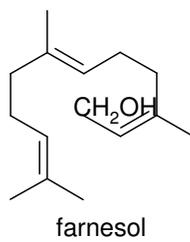
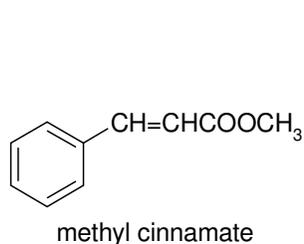
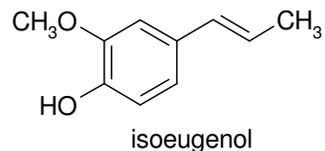
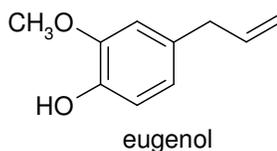
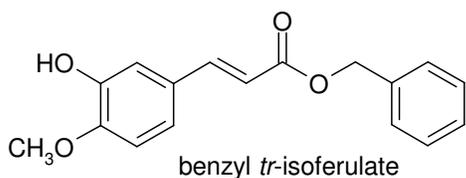
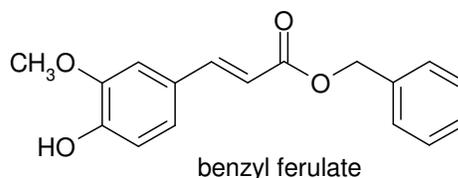
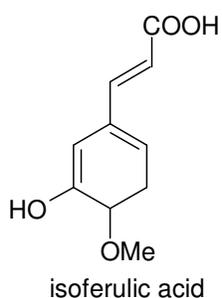
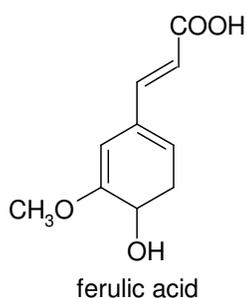


Of the free balsamic acids, *trans*-cinnamic & benzoic acids (typically to 30% & 11% respectively) are also present in large amounts in the balsam, together with smaller amounts of unesterified alcohols, such as benzyl alcohol (to 2%), cinnamic alcohol (to 0.5%) and some minor content of free coniferyl alcohol.



Also amongst the more minor components of Peru balsam, are the relatively unstable coniferyl benzoate (occurring at 1% to 8%, the concentration depending on the age & storage history of the balsam), coniferyl cinnamate, eugenol (to 0.2%), isoeugenol (to 0.2%), methyl cinnamate (typically to 1%), ferulic acid (which is 3-(4-hydroxy-3-methoxyphenyl)prop-2-enoic acid) (traces) and isoferulic acid (which is 3-(3-hydroxy-4-methoxyphenyl)prop-2-enoic acid) (to 0.4%). Since coniferyl benzoate is readily labile on many types of GC column, this constituent can easily be missed or underestimated during analysis. Small amounts of the benzyl esters of ferulic & isoferulic acids, hydroconiferyl cinnamate, hydroconiferyl benzoate and traces of farnesol isomers are also present. Top-note compounds such as styrene, guaiacol, ethyl benzoate and benzaldehyde have also been shown by various workers to typically occur in the product, but many of the more minor components of Peru balsam remain either unknown or their actual presence is not widely confirmed.





Further Reading.

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