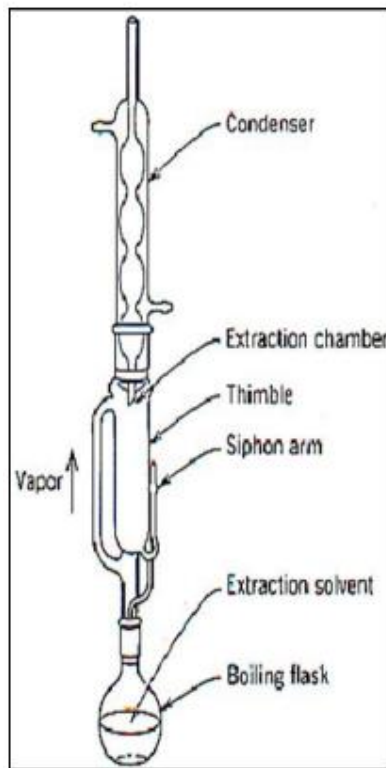


LAB 7 Extraction methods

Soxhlet extraction (hot continuous extraction) : The process of transferring the partially soluble components of a solid to the liquid phase using a Soxhlet extractor. The solid is placed in a filter paper (thimble) which is then placed into the main chamber of the Soxhlet extractor. The solvent heated to travels into the main chamber and the partially soluble components are slowly transferred to the solvent.



Tincture: Tinctures are concentrated liquid extracts of medicinal herbs. The most common liquid used to extract the medicinal properties of herbs is alcohol, but you can also use vinegar and glycerine, in combination or on their own.

Tinctures can be made in several ways: Folk and ratio methods of maceration, or by percolation.

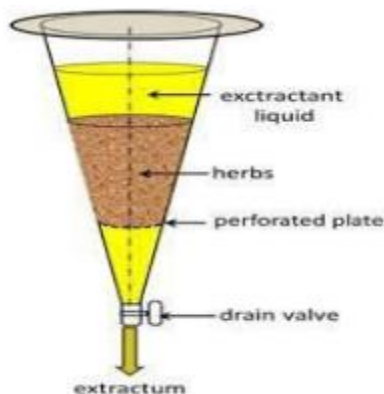
Folk Method – cut up fresh plant material and fill a jar to the top, packing it in well but not too hard. Fill to the top with 50% alcohol and allow steep for 4-6 weeks. Dried plant material – fill the jar $\frac{1}{4}$ - $\frac{1}{3}$ of the way with dried plant material (maybe a little more if it's fluffy) and fill to the top with alcohol. Allow to steep for 4-6 weeks.

Ratio Method – cut up and weigh plant material. Put in a jar and add the appropriate amount of water/alcohol mixture to achieve desired ratio. 1:2 is ideal for fresh plant material and 1:5 is common for dried plant material.

Percolation method – this can only be done with dried, powdered herb. The herb is packed evenly into a funnel which sits in a container, and the menstruum is then poured over the top to slowly percolate through the powdered herb.

Benefits – can make a tincture in 1-2 days, instead of 4-6 weeks. Does not require straining and squeezing.

Disadvantage- must use dried powdered herb. Does not extract gums or mucilages as well. Cannot use glycerin



Menstruum (solvent)

Alcohol- extracts many of the plant's constituents and is rapidly absorbed into the bloodstream. The percentage of alcohol to water alcohol is 50% alcohol (and 50% water), 40% alcohol (and 60% water). To preserve your tincture, you need at least 25% alcohol by volume.

Glycerine- is sweet and soothing to our mucous membranes (such as the throat and gut). Like alcohol, it is a natural preservative, but it does not extract as many of the herb's components. However, if you want a sweet tasting remedy, especially for child, glycerine can be used as a menstruum.

Glycerites (Glycerine-based tinctures) don't last as long as alcohol-based ones. You can refrigerate them if you wish.

Vinegar- like alcohol and glycerine, is a natural preservative and extracts certain properties. While it doesn't draw out medicine from plants as well as alcohol, it is very good for digestion.

Plant we use in this Lab.:

Turmeric is a spice derived from the rhizomes of *Curcuma longa*, which is a member of the ginger family (**Zingiberaceae**). Rhizomes are horizontal underground stems that send out shoots as well as roots. The bright yellow color of turmeric comes mainly from fat-soluble, polyphenolic pigments known as curcuminoids. Curcumin, the principal curcuminoid found in turmeric, is generally considered its most active constituent

Properties of Curcumin: Curcumin has antioxidant, anti-inflammatory, antiviral and antifungal actions. Studies have shown that curcumin is not toxic to humans. Curcumin inhibits the growth of *Helicobacter pylori*, which

causes gastric ulcers and has been linked with gastric cancers. Curcumin can bind with heavy metals such as cadmium and lead, thereby reducing the toxicity of these heavy metals. This property of curcumin explains its protective action to the brain

Procedure:

One gram of plant in



50 ml of 50% alcohol



[each group prepare tincture with one method (Folk, Ratio or Percolation)]