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Elm

» Elm is the dried inner bark of *Ulmus rubra* Muhlenberg (*Ulmus fulva* Michaux) (Fam. Ulmaceae).

#### Botanic characteristics—

**Unground Elm**— Unground Elm occurs as broad, flat, oblong pieces from 1 to 4 mm in thickness. The outer surface is yellow-orange with some brown outer bark or cork layers attached; the inner surface, which is pale yellow, is marked faintly with striated phloem lines. The fracture is fibrous with projections of five bast bundles.

**Powdered Elm**— Powdered Elm is weak yellowish orange and has a distinctive fenugreek-like odor. Bast fibers are numerous, very long, usually broken, up to 25 µm in diameter, thick-walled, unlignified or with only a thin outer sheath of the wall lignified; calcium oxalate prisms from 10 to 35 µm in length; starch grains spheroidal or polygonal, usually from 3 to 15 µm in diameter, occasionally up to 25 µm in length; and numerous mucilage fragments, frequently lamellated. Cork cells are few or absent.

**Packaging and storage**— Preserve in well-closed containers, and store in a cool, dry place.

#### Identification—

**A:** Macerate 1 g of finely powdered Elm with 40 mL of cold water for 1 hour: the mixture is of a thick mucilaginous consistency and yellowish brown in color.

**B:** Extract 1 g of *Powdered Elm* with 10 mL of 60% methanol on a water bath for about 15 minutes, cool, filter, and concentrate the filtrate to about 2.5 mL. Separately apply 20 µL of this solution and 20 µL of a standard solution containing 0.025% rutin in methanol to a thin-layer chromatographic plate coated with a 0.25-mm layer of chromatographic silica gel. Develop the chromatogram in a solvent system consisting of a mixture of ethyl acetate, water, anhydrous formic acid, and glacial acetic acid (100:27:11:11) until the solvent front has moved about three-fourths of the length of the plate. Remove the plate from the chromatographic chamber, and allow to air-dry. Spray the plate with a 1% solution of 2-aminoethyl diphenylborinate ester in methanol followed by a 5% solution of polyethylene glycol 4000 in alcohol, and examine the plate under UV light at 366 nm: the  $R_f$  values of the principal spots relative to rutin are about 1.05 (blue) and 0.8 (orange).

**Outer bark**— It contains not more than 2% of adhering outer bark.

**Foreign organic matter**  $\langle 561 \rangle$ : not more than 2%.

**Loss on drying**  $\langle 731 \rangle$  — Dry about 2 g of Elm, accurately weighed, in an oven at 105° to constant weight: it loses not more than 12% of its weight.

**Total ash**  $\langle 561 \rangle$ : not more than 10%, calculated on the dried basis.

**Acid-insoluble ash**  $\langle 561 \rangle$ : not more than 0.65%, calculated on the dried basis.

**Residual solvents**  $\langle 467 \rangle$ : meets the requirements.  
(Official January 1, 2007)

**Auxiliary Information—** *Staff Liaison* : [Elena Gonikberg, Ph.D., Scientist](#)

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