

## PHARMACOGNOSTIC STUDIES OF FRUITS OF CRATAEGUS OXYACANTHA LINN\*

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**ABSTRACT:** Pharmacognostic studies of fruits of *Crataegus oxyacantha* Linn. (Rosaceae) were done to lay standards for their identification in powdered form.

Diagnostic features include thick-walled oval, isodiametric succulent exocarpic parenchyma cells, bands of brachysclereids, thick-walled scleriform wide lumened crystal bearing cells of middle layers of the seed coat.

### INTRODUCTION

Microscopic studies of fruits of *Crataegus oxyacantha* Linn. (synonyms: *Crataegus monogyna* Jacq., *C. oxycanthoides* Thruill) were done with a view to lay down identification standards of them. Anatomical studies of fruits of *Crataegus oxyacantha* Linn. were not done before<sup>1</sup>. Fruits of *Crataegus oxyacantha* contain aesculin<sup>1</sup>, procyanidin<sup>2</sup>, 4'-O rhamnosylvetexin<sup>2</sup> (vitexin reported only from *Crataegus oxyacantha*, syn. = *C. monogyna*), Cynogenetic glycosides<sup>3</sup>, high vitamin contents up to 1.5 mg/g, crategolic acid<sup>7</sup> (2 $\alpha$ , 3 $\beta$ -Dihydroxy-12-Oleanen-28-Oic acid., maslinic acid); fresh fruit contain citric, tartaric, crataegus acids, pectin, fatty oil (0.76%), glucose, fructose, vitexin 4-xyluside<sup>2</sup> and oxalic acid<sup>6</sup>. Seeds contain amygdalin, emulsin. Fruits are also reported to contain urosolic and oleanolic acids<sup>8</sup>, choline<sup>9</sup>, acetylcholine<sup>9</sup>, trimethylamine<sup>9</sup>.

Fruits (*Crataegus lactone*) causes coronary vasodilation.<sup>4</sup> It is also reported useful in dyspnoea, valvular insufficiency, heart oppression; reduces blood pressure, relaxes uterus, intestine, constricts bronchi and coronary arteries.

### EXPERIMENTAL

Samples of *Crataegus oxyacantha* Linn. fruits were collected from three different sources. Each sample was identified morphologically and compared with standard samples in Homoeopathic Pharmacopocia Laboratory, Ghaziabad.

*Morphology:* Fruits were ovoid, subglobose, glabrous, red or wine-red rarely yellowish, when ripe wrinkled or shrunken with hard stony 1-2 celled<sup>5</sup> nut, crowned with five reflexed calyx tips.

*Methodology:* Histological studies were made on fruits and their powder. For cross section studies, the material was processed following usual technique of first reviving with boiling water, then cooling and softening with hydrofluoric acid. It was then thoroughly washed, dehydrated using ethyl alcohol, cleared with xylene, impregnated with beeswax and finally sliced at

\*Paper received in October 1984.

20 $\mu$  using rotary microtome techniques. For study of powder, the material was macerated with 5% aqueous potassium hydroxide solution.

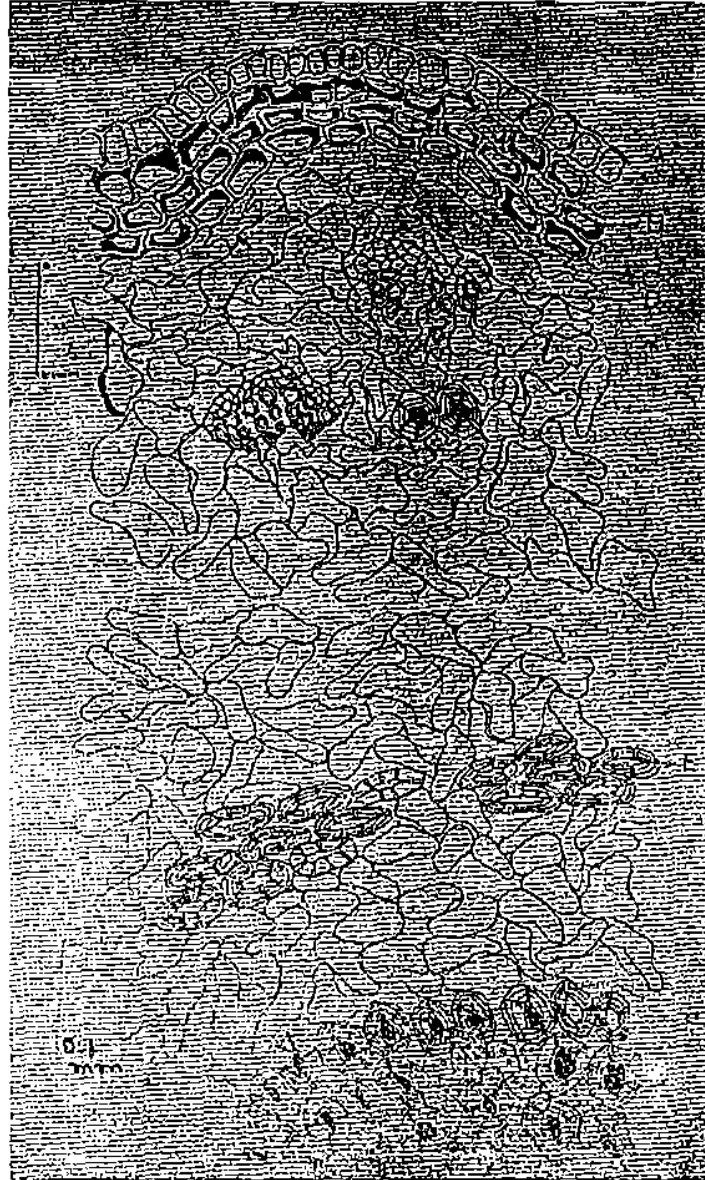


Fig. 1—T.S. FRUIT—*Crataegus Oxyacantha* Linn  
A. Exocarp; B. Collenchyma; C. Mesocarp; D. Vascular bundles; E. Brachy & macrosclereids; F. Endocarp of sclereids.

*Microscopy*: Fruits in cross section (Figs. 1, 2) were composed of a layer of exocarp of thick-walled usually radially elongated cells, followed by 2 to 3 layers of tangentially elongated collenchyma cells; a wide mesocarp of succulent parenchyma embedding therein endarch vascular bundles and interrupted bands of macro to brachysclereids; and endocarp of sclereids comprising an outer zone of radially arranged 20 to 28 layers of brachysclereids and an inner zone of 2 to 3 rows of tangentially arranged macro and brachysclereids. Sclerenchyma cells with simple pits, vascular elements, crystal cells also frequently occur in the endocarp.

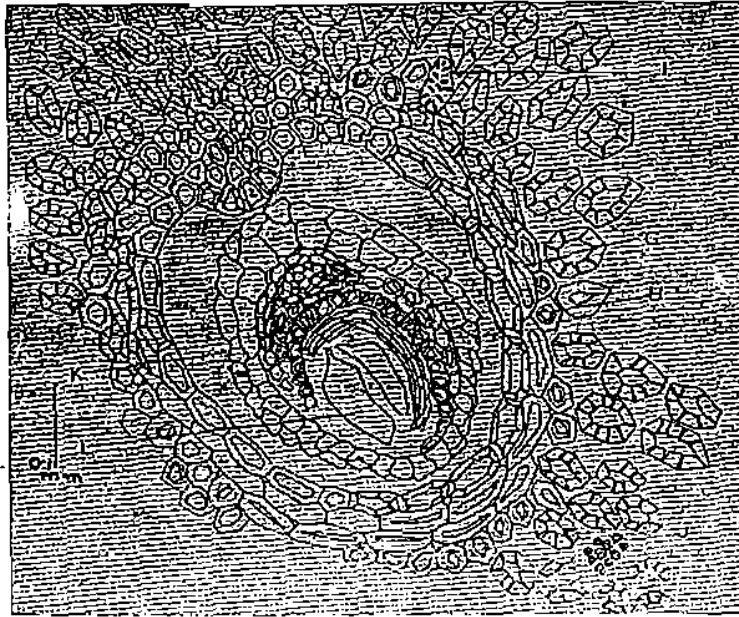


Fig. 2—T.S. FRUIT—(Endocarpic region & seed)—*Crataegus oxyacantha*  
 F. Endocarp outer zone with brachysclereids; G. Endocarp inner zone with macrosclereids; H. Crystal cells; I. Sclerenchyma cells with pits; J. Vascular elements; K. Seed coat; L. Cotyledon.

Seeds were exalbuminous (non-endospermic). Seed coat consisted of 1 to 2 layers of large sinuous rectangular parenchyma cells, followed by middle zone of 2 to 3 layers of rectangular, oval thick walled wide lumened scleriform cells, most of which bearing single rectangular crystal, and an inner zone of 4 to 5 layers of parenchyma and conducting elements confining to the polar region surrounded by sclerenchyma cells. Cotyledons were two, convex externally, nochular at one end and comprised of a layer of radially elongated epidermal cells followed by 1 to 2 layers of tangentially and radially elongated storage parenchyma cells and central vascular strands.



Fig. 3—T.S. SEED—(Cotyledons)—*Crataegus oxyacantha*  
L. Storage parenchyma; M. Cotyledons.

*Microscopy of powdered fruits:* Powdered fruits were dark brown in colour and composed of tetra to hexagonal epicarpic cells without pits; elongated, thin-walled rectangular parenchyma cells; thick walled oval, isodiametric succulent parenchyma cells, macrosclereids and numerous brachysclereids in groups; xylem strands with spiral and scalariform thickenings; long thick-walled, narrow lumened sclerenchyma fibres with tapering ends; isolated crystal cells, crystals being rhomboid and rectangular.

#### CONCLUSION

Fruits of *Crataegus oxyacantha* Linn. should contain thick walled, oval isodiametric succulent exocarpic parenchyma cells, bands of brachysclereids; thick walled scleriform wide lumened crystal bearing cells from the middle layers of the seed coat.

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