# SCIENTIFIC SECTION

## BLACK CHOKEBERRY BARK AS A SUBSTITUTE FOR VIBURNUM CASSINOIDES.*,[1]

BY HEBER W. YOUNGKEN.

While investigating the Viburnum situation in the Southern United States during the month of June 1929 the writer put up with a drug collector near Pineola, North Carolina, who, upon request, escorted him to a nearby ravine and pointed out the kinds of shrubs from which some of the Shonny Haw bark was collected in that region.

It was apparent that two entirely different barks were being gathered and marketed from this section, one called by my host "True Shonny Haw" and a second which he termed "Buck Shonny Haw."

The shrubs termed "True Shonny Haw" proved to be *Viburnum cassinoides* L., while those called "Buck Shonny Haw" were identified by the writer as a variety of Black Chokeberry known to botanists as *Aronia melanocarpa* Elliott **var.** *grandifolia* Schneid.

From June 8th to June 10th the writer botanized within a radius of about 10 miles in this section of North Carolina and came upon a large number of these plants.

Fig. 1.—*Aronia melanocarpa* Elliott **var.** *grandifolia* Schneid. Leaf and flowering branch. (× 1/4)

### DESCRIPTION OF ARONIA MELANOCARPA VAR. GRANDIFOLIA.

The plants observed in the vicinity of Pineola on June 8th to 10th were shrubs from 5 to 8 ft. in height growing on the sides of woodland hills and were in flower at the time of observation. They had alternate, obovate to broad obovate and ovate leaves, lustrous dark green on the upper surface and pale green, glabrous on the lower surface, with abruptly acuminate to mucronate apices and crenate-serrulate margins, up to 8 cm. long and up to 5 cm. broad. The flowers were white, pentamerous, and arranged in axillary corymbs. The fruits of all the *Aronias* are described by Bailey (1) and Rehder (2) as small pomes without grit cells in flesh.

Herbarium sheets of leaf and flowering branches of this material were later verified as to diagnosis by Dr. Alfred Rehder of the Arnold Arboretum.

* This investigation was aided by a grant from the A. PH. A. Research Fund.

[1] Scientific Section, A. PH. A., Rapid City meeting.

DESCRIPTION OF STEM BARK.

The stem bark exhibits an outer surface which varies from grayish brown to purplish brown and is smooth, shining and striped transversely, in areas, having circular to ovate, raised lenticels, the latter arranged lengthwise. Its inner surface is whitish to light brown, longitudinally striate. Its fracture is tough-fibrous, the inner bark separating in irregular layers. Its odor is indistinct and its taste is astringent and slightly bitter.

MICROSCOPIC DESCRIPTION OF STEM BARK.

Transverse, radial-longitudinal and tangential-longitudinal sections of this bark were examined separately in water, chloral, phloroglucin-CHl, and iodine water mounts with the following observations:

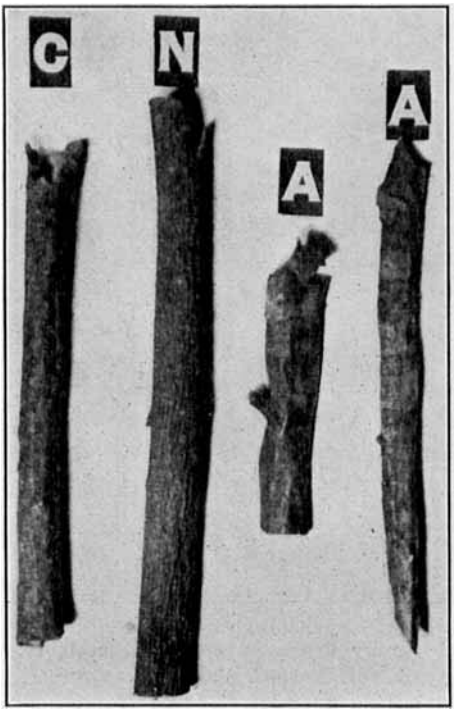


Fig. 2.—*A*, stem bark of *Aronia melanocarpa*, Elliott, var. *grandifolia*, Schneid. *C*, stem bark of *Viburnum cassinoides*, L. *N*, stem bark of *Viburnum nudum* L. (× 1/2)

The cork is of subepidermal origin and composed of tangentially elongated cells with suberized walls and frequently reddish to occasionally purplish red or purple contents. The outer and inner walls of the cork cells are more thickened than the radial ones, showing at times thick deposits of suberin which form convexities encroaching upon the cell lumen. Surface sections of this tissue show cells mostly elongated longitudinally.

The phellogen exhibits tangentially elongated cells, in cross sections, with protoplasmic contents.

The secondary cortex consists of several layers of somewhat collenchymatic cells containing chloroplastids and in some cases rhombohedral crystals of calcium oxalate in young and middle-aged bark.

The primary cortex is composed of parenchyma cells, elongated tangentially in cross sections and isolated groups of sclerenchyma fibers. Some of the parenchyma cells contained brownish red to purplish red to purple contents, but the majority of these contained granular contents and tannin.

The pericycle resembles somewhat the cortex, consisting of a parenchymatous zone containing interrupted groups of lignified pericyclic fibers. Some of the parenchyma cells contain rhombohedral crystals of calcium oxalate, others tannin and granular contents.

The phloem consists of a broad zone divided into numerous phloem patches, as observed in cross sections, by numerous narrow, medullary rays which converge

in groups. Many of the phloem patches contain groups of lignified bast fibers resembling those of the primary cortex and pericycle. The medullary rays were mostly 1-cell wide, occasionally 1–2 cells wide in the tangential sections examined. The cells of these have fairly thick, beaded walls. Some contained rhombohedral crystals of calcium oxalate, others tannin and granular contents.

In radial-longitudinal and longitudinal-tangential sections the sclerenchyma fibers of cortex, pericycle and phloem exhibited an irregular lumen with rounded ends and lignified walls.

Many crystal fibers were found in these sections containing rhombohedral and rod-shaped crystals of calcium oxalate. In some cases 2 or 3 rods were found in the same cell.

No stone cells nor rosette crystals of calcium oxalate were present in this bark, nor was there any valeric acid odor present, even upon triturating it with phosphoric acid.

Fig. 3.—Black Chokeberry Bark, *Aronia melanocarpa* var. *grandifolia*. *K*, cork; *C*, cortex; *Pe*, pericycle; *pf*, pericyclic fibers; *P*, phloem; *bf*, bast fibers; *mr*, medullary rays. (× 65)

SUMMARY AND DISTINCTIONS.

A substitute for *Viburnum cassinoides* bark has been discovered which has been collected and offered on the market as Shonny Haw.

The plants yielding this substitute are identified by the author as a variety of the Black Chokeberry, scientifically known as *Aronia melanocarpa*, Elliott **var.** *grandifolia* Schneid.

A description of the flowering shrubs as observed by the writer near Pineola, N. C., is given. These differ from *Viburnum cassinoides* in several particulars among which are the obovate to broadly obovate leaves with crenulate-serrulate margins and abruptly acuminate to mucronate apices as compared with the elliptic, ovate, to ovate lanceolate leaves with acute to bluntly acuminate apices and irregular dentate to denticulate margins of *V. cassinoides*, the arrangement of the flowers in corymbs instead of compound cymes as in *V. cassinoides* and the small pome fruits as compared with the drupes with flattened stones of *V. cassinoides*.

The physical characteristics of the stem bark are described, the most important distinctions from the stem bark of *V. cassinoides*, previously described by the

writer (3), being the tough fibrous fracture, absence of valeric acid odor and slightly bitter taste as compared with the short, irregular fracture, valeric acid odor and more bitter taste of *V. cassinoides*.

A microscopical description of the stem bark of *Aronia melanocarpa* **var.** *grandifolia* is given for the first time. It is found to differ from the stem bark of *V. cassinoides* (3) in many particulars chief among which are the absence of rosette crystals of calcium oxalate and stone cell groups and the presence of rod-shaped crystals and numerous groups of sclerenchyma fibers.

REFERENCES.

(1) L. H. Bailey, "The Standard Cyclopedia of Horticulture," 1 (1922), 396.

(2) A. Rehder, "Manual of Cultivated Trees and Shrubs," page 384.

(3) H. W. Youngken, "Viburnum Cassinoides, a Recent Substitute for Viburnum Prunifolium," JOUR. A. PH. A., 17 (1928), 330–335.

**E. L. Newcomb** said that in the last five or ten years that the origin of some of our drugs has not been that which was formerly thought to be the source. He expressed appreciation of Dr. Youngken's investigations.

MASSACHUSETTS COLLEGE OF PHARMACY,
August 2, 1929.

---

## STABILITY OF ANÆSTHETIC ETHER IN CONTAINERS OF VARIOUS TYPES.*

BY F. VAN DERIPE, L. W. GREEN AND R. E. SCHOETZOW.

It is the practice of European manufacturers to package anæsthetic ether in glass bottles, stoppered, some with glass stoppers, others with cork stoppers and still others with leadfoil-covered cork stoppers. Until about thirty years ago Squibb Ether was packaged in containers of the last named type. Due to slow but definite losses of ether by evaporation, and fire-hazard following possible breakage in shipping, this type of container was discontinued and hermetically sealed tin cans adopted by Dr. Edward R. Squibb.[1] Considerable experimental evidence over a number of years has shown that contact with metallic copper has a marked effect in preventing the decomposition of ether. Accordingly, Squibb Ether is now packaged in hermetically sealed tin cans, the interior of which is copper-plated.

In order to confirm the findings of Nitardy and Tapley[2] in regard to the superior keeping qualities of anæsthetic ether packaged in copper-plated cans over that packaged in tin cans and glass bottles, the following experiment was undertaken.

A batch of Anæsthetic Ether was subdivided into glass-stoppered amber bottles, ordinary tin cans and copper-plated tin cans. About one hundred and seventy containers of each type were put up, each container holding a quarter-pound of ether. These were stored in the dark, at room temperature for a period of fifteen months. Periodically, ten containers of each type were opened and

---

* Scientific Section, A. PH. A., Rapid City meeting, 1929.

[1] Dr. Edward R. Squibb, *Ephemeris*, 2 (1884), 621.

[2] F. W. Nitardy and M. W. Tapley, JOUR. A. PH. A., 17 (1928), 966. *Anaesthesia and Analgesia*, 7 (1928), 318. *Brit. J. Anesth.*, 6 (1928), 53.