

ANOTHER OHIO GROWN RUBBER.<sup>1</sup>

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Of the many kinds of crude rubber, the botanical family, Apocynaceae, produces its share of good grades. Mangabeira (genus *Hancornia* in Brazil), Benguela root rubber (*Landolphia*) and *Funtunia*, both Africans, are notable examples.

The Apocynaceae are trees, shrubs, and herbs, with a milky acrid juice, numbering some 1000 species, grouped into 130 genera, inhabiting sub-tropical areas. This family of plants produces a varied line of economic products, such as edible fruits, dyes, drugs, fibres, ornamental plants and caoutchouc. The Madagascar Ordeal Plant, whose seed contains the most powerful poison known, and Eden's Forbidden Fruit, register here.

Several members of the type genus *Apocynum*, of this family, are common to the United States, the so-called Indian Hemp, *Apocynum cannabinum* and *A. androsaemifolium*. During the past summer, I have examined the latex of the latter species for quantity and quality of its rubber. The results of this investigation show that the latex of this plant gives a small quantity of good grade rubber.

The latex is white, viscous, neutral or slightly acid, and has the strong acrid odor peculiar to this plant. The latex reacts with the usual coagulating reagents, in the following manner:

*Acids* do not coagulate; latex becomes thin.

*Alkalies* do not coagulate; restore the viscosity; change the color from white to brownish yellow.

*Boiling* coagulates slightly and slowly.

*Acetone* in proportion of 1/10 volume, coagulates immediately and completely; liquid is colored chocolate red.

*Formaldehyde* coagulates readily, but is much slower than acetone.

*Phenol* coagulates the latex, but gives a soft product.

*Salt Solution* coagulates slowly, giving a finely divided precipitate, hard to coalesce. *Boiling* the saline solution gives a soft product; not successful. Of the above methods, the use of acetone or alcohol, and formalin, are the only ones recommended. Of these two, acetone is preferred.

The latex of *Apocynum* differs from that of *Asclepias* in that it coagulates spontaneously, even if it is kept in closed containers. The spontaneously coagulated latex gives:

Liquid portion.....	67.58%
Cheese (wet).....	32.42%

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The liquid is white, slightly acid and acrid odor. This liquid failed to coagulate after addition of more acid. Slight excess of alkali increased its viscosity, changed its color from white to brownish yellow, but did not coagulate or precipitate it. Boiling had no effect. Excess of acetone gave a finely divided precipitate the particles of which were not cohesive. Evaporation of the mixture, after washing with water and treatment with boiling acetone, gave a small quantity of black, soft rubber, destitute of strength. The *cheese* was composed of:

Water.....	33.46%
Rubber.....	3.99%
Resin.....	62.95%

Working up this *cheese* of the plant in the usual manner with solvents, straining through gauze to remove dirt, evaporating, with low heat, the excess of solvent adding an excess of precipitant, washing the precipitant and dissipating the precipitating agent, gave a good grade rubber.

The rubber obtained in this manner is black, firm, not tacky, odorless and strong. In quality it is much better than the product obtained from its neighbor, Milkweed. The qualities of this rubber confirm the old adage "that blood is thicker than water," and proves a more apt one, "that Apocynaceous rubbers are good rubbers."

Milkweed latex, however, is richer in rubber than that of Indian Hemp. The proportion of rubber in the entire plant remains on the same ratio as the amount of latex remains equal, and in both cases is entirely too small to be profitable. Of the total rubber present in the latex, 96% of it is won in the *cheese* formed by the natural coagulation of the latex. Ninety-six per cent of the total rubber found, ranks as Grade A, and four per cent grades as C.

The resin is mahogany red, transparent, medium hard, slight characteristic odor and tasteless.

During this investigation we have found that the soil conditions under which the plant was grown, exerts an influence upon the amount of rubber in the latex. Plants grown upon dry, sandy soil of West Akron, gave a latex containing 2.27% rubber and 20.69% resin. The latex of plants grown upon the wet swamps of South Akron, contained 1.12% rubber and 15.04% resin. Rubber from dry grown plants is of better quality than that of wet grown plants.

Natural latex from dry land Apocynum contains:

Water.....	72.29%
Solids.....	26.21%
Ash.....	1.59%

This rubber content in fresh latex is 2.36%.

The above figures refer to latex taken from plants near the end of the growing season.

Apocynum also gives *apocynin*, a drug having a similar action to digitalis and, according to Biddle, being an efficacious remedy in dropsy. The bark of this plant gives a strong, tough fibre, at one time much esteemed by the American Indians for bowstrings and fishing nets.

Akron, Ohio.

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