PRELIMINARY REPORT UPON CHEMICAL EXAMINATION OF THE ENTIRE PLANT OF CELASTRUS SCANDENS.*

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(WITH CARL BUHLER, HARVEY KIMBEL, ALBERT NIEBAUR, ANDREW RUZEK AND VINCENT WASZ.)

The entire plant was collected in the fall and separated into leaves, fruit, bark, wood and root, each of the five students being given a part for investigation. The work, though still in the preliminary stages, has yielded extremely interesting products.

The general plan followed in this examination was to dry the plant material, reduce it to powder, and then extract it by continuous percolation with petroleum ether, ether and alcohol successively. Moisture determinations of both fresh and dried material, and ash determinations, were made of each plant part.

Leaves.—The dried and powdered leaves had a beautiful bright green color. Both the petroleum ether and the ether extracts from this powder were rich in chlorophyll. From these extracts a thick dark oily product resulted. Its saponification value is low. From it there has been obtained an unsaponifiable residue which is precipitated by digitonin and responds to the color reactions for sterols.

From the alcoholic extract of the leaves there has been isolated a small quantity of a white crystalline substance which has a sweetish taste but does not reduce Fehling's solution. Upon hydrolysis, however, it has reducing properties. This material is difficultly soluble in cold alcohol, much more soluble in hot alcohol, soluble in dilute alcohol, especially when hot, and in water.

Stem.—The bark of the stems was tough and stringy when dried. It could not be ground in a mill, so it was clipped with scissors into pieces about an eighth of an inch long, packed in a percolator and extracted in the same way as the leaves. The extracts were somewhat greenish in color though little chlorophyll was extracted. As from the leaves, an unsaponifiable substance which responded positively to tests for sterols was obtained, also the same, or a similar, white crystalline substance. This melted at 182°. Upon hydrolysis no evidence of a non-sugar material was found. The hydrolyzed product reduced Fehling's solution and yielded, with phenylhydrazine, an osazone which melted at 190–191° and resembled, in its crystalline form, galactosazone.

The wood of the stem also yielded a sterol-like substance and a white crystalline product which was, at first, thought to be identical with that from the leaves and bark, but which refused to hydrolyze and yield a reducing sugar. This material resembles in appearance, taste and solubility the hexatomic alcohols, mannitol, dulcitol, sorbitol. Its melting point, by repeated crystallizations, was raised to 186°, too high for mannitol or sorbitol but approaching that of dulcitol.

Root.—The red outer bark of the root was carefully removed with a knife, then ground to powder. This powder was packed in a percolator and extracted by continuous percolation with low boiling petroleum ether (Skellysolv B, b. p. 65°). After extracting for about three hours the heat was removed, and the deep red

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petroleum ether extract was allowed to stand over night. In the morning beautiful ruby red crystals were found to have separated in the flask. These were filtered on a pad of solid carbon dioxide and kept in a sealed tube filled with the gas. They melt at 192°, the melting point of β-carotene, and resemble β-carotene in solubility and crystalline form. Longer extraction with petroleum ether produced more of the red product and, finally, an orange-colored powdery precipitate, which is easily separated from the red crystals by washing with ether.

Work upon the woody portion of the root has scarcely begun. There is being obtained, however, a sterol-like substance and a white crystalline substance resembling those from the leaves and stem.

Fruit.—The outer husk was separated from the fruit and it and the berry were dried separately. The dried husks were ground in a mill. The berries, after drying, were rubbed on a coarse sieve with a large cork, and the arillus was thus separated from the seed. The coarse powder thus obtained was of a deep red color. It and the powdered husks were extracted separately with low boiling petroleum ether. From the deep red extracts no crystals separated upon standing. The extracts were then concentrated by distillation of the petroleum ether, and red fatty masses resulted, that from the arillus of the seed being the more intensely colored. This product was saponified by boiling with alcoholic potassium hydroxide. After the alcohol was evaporated water was added to the reaction mixture and it was shaken out with ether. Small deep red needle-shaped crystals separated upon evaporation of the ether. Only a small quantity of this material has been obtained. Neither it nor the other products of the hydrolysis have been investigated.

There have, therefore, been isolated from the plant, and partly identified:

One or more substances which respond to the tests for sterols.

One or more red crystalline substances which resemble carotene, probably β-carotene.

Two or more white crystalline substances, one of which yields upon hydrolysis a reducing sugar which forms an osazone with the melting point and crystalline form of galactosazone. The other is non-sugar in character, probably a sugar alcohol, possibly dulcitol.

All of these products, and others not so well characterized, are undergoing further examination and will be reported upon later.

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SOME OBSERVATIONS ON THE STABILITY OF QUININE SULPHATE DURING STORAGE.*

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Under certain conditions quinine sulphate may crystallize from water with 8 molecules of water of hydration. This product rapidly loses some of its water,

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[1] Food and Drug Administration, Washington, D. C.