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Botanical Medicine Monographs and Sundry

ASCLEPIAS CORNUTI[1] AND ASCLEPIAS TUBEROSA.

By FRED. B. QUACKENBUSH.

Read at the Pharmaceutical Meeting, February 19.

An analysis of *Asclepias tuberosa* was made in 1861 by Elam Rhoads,[2] who announced the presence of a peculiar principle possessing the taste of the root which he obtained from a concentrated infusion of the drug by precipitation with tannic acid.

In 1881, W. L. Hinchman[3] observed in *Asclepias Cornuti* a crystalline principle, but obtained it in a different manner. He treated the drug with petroleum ether, evaporated spontaneously and treated the residue with 95 per cent. alcohol from which yellow wart-like crystals were deposited which after purification were white. List, in 1849, also separated a crystalline principle from the milk juice by exhausting the congealed juice with ether.

The *Asclepias Cornuti* used in the following analysis was collected and carefully dried by Prof. Henry Trimble during the summer of 1888.

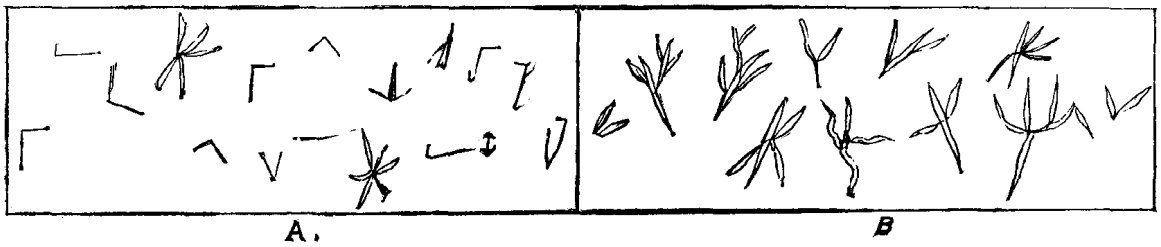
A complete analysis of the *Ascelepias tuberosa* was not made, but it was examined for the purpose of learning if the crystalline principle which was found in the *Asclepias Cornuti* also existed in it.

Fifty grams of the powdered root were macerated with petroleum ether in several portions. This solution showed a distinct fluorescence similar to that observed in petrolatum, and yielded on evaporation 1.44 per cent. of a peculiar residue supposed to consist of caoutchouc, resin and volatile oil to the extent of 2 per cent. This residue was insoluble in 95 per cent. alcohol, slightly soluble in absolute alcohol, and very soluble in ether and chloroform.

The residue of the drug was next treated with stronger ether in the same manner as with the petroleum ether. This ethereal solution gave the same fluorescence as the petroleum ether and yielded on evaporation 1.3 per cent. of residue. This residue was treated successively with water, water containing 1 per cent. hydrochloric acid and with water made slightly alkaline with potassium hydrate. The former gave no response to tests for glucosides, alkaloids or gallic acid. The second, which gave a distinct test for glucosides, on being neutralized with sodium hydrate deposited a

[1] The current name is *Asclepias syriaca*
[2] AMER. JOUR. PHAR., 1861, p. 493.
[3] AMER. JOUR. PHAR., 1881, p. 433.

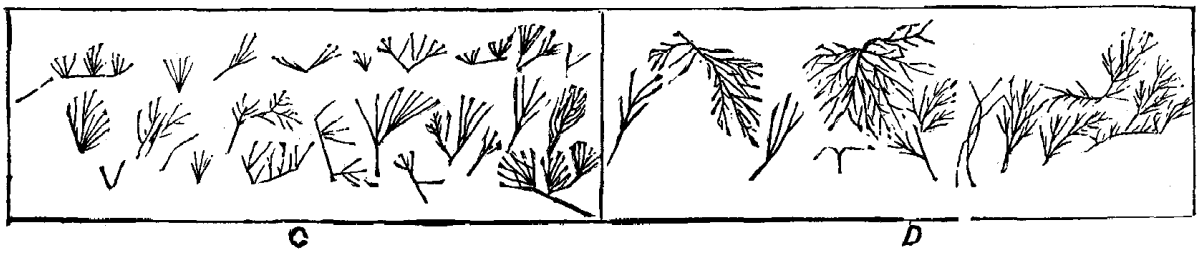
flocculent precipitate. This solution containing the precipitate was agitated with stronger ether, which on spontaneous evaporation deposited a small quantity of crystals, which upon recrystallization assumed the form shown in Fig. A.



The alkaline solution gave negative tests as in the case of the aqueous solution.

One hundred grams of the powdered root of *Asclepias tuberosa* were macerated in petroleum ether and stronger ether and the residue from the ether solution treated with acidulated water as in the case of the *Asclepias Cornuti*. From this solution crystals were obtained by agitation with ether and evaporation of the ethereal solution. These crystals upon recrystallization from ether had the form as shown in Fig. B.

The residue of the *Asclepias Cornuti* was next exhausted with absolute alcohol. This alcoholic solution also showed the fluorescence as noted in the other solvents and yielded 3.58 per cent. of residue, which was completely soluble in water, and was taken up in that liquid and the tests applied for tannin and alkaloids with negative results. It, however, responded to the tests for glucosides. The aqueous solution was then agitated with petroleum ether, ether and chloroform. The ether and chloroform solutions both deposited crystals which recrystallized from ether in the form shown in Fig. C. The aqueous solution after treatment as stated above was made alkaline and again agitated with the same solvents. I obtained no crystals from these solutions, but the petroleum ether gave a peculiar residue, having an odor analogous to that of musk, and which is probably the odorous principle observed by Rhoads in 1861.



The residue of the *Asclepias tuberosa* was next exhausted with absolute alcohol, and the alcoholic solution treated in the same manner as was the *Asclepias Cornuti.* The aqueous solution of the residue upon agitation with ether and evaporation of the ethereal solution yielded crystals which, on redissolving in ether, crystallized from that liquid in the form shown in Fig. D. The crystals obtained from both the ether and alcohol appear to be one and the same compound. The crystals all reduced Fehling's solution and gave the following color reactions :

(a) With sulphuric acid they gave first a brown color, gradually changing to a blackish

brown.

(b) With sulphuric acid and bichromate potassium they assumed at first a deep brawn color, but on allowing to stand thirty minutes a purple color was produced which was very distinct in thin layers.

(c) Nitric acid after some time produced a slight pinkish color.

(d) Hydrochloric acid and ferric chloride developed no change of color.

This principle exists in the drug in very small quantities, only enough being obtained from one hundred grams of the drug to make the tests as given above.

The residue of the *Asclepias Cornuti* was then treated successively with water, a weak alkaline solution, a 1 per cent. acid solution and chlorine water.

In these solutions were found, by the usual methods of detection and estimation, sugar, 5.16 per cent., of which 3.29 per cent. was saccharose. Mucilage, 3.6 per cent.; trace of dextrin; albuminoids, 2.4 per cent.; calcium oxalate, 2.75 per cent.; coloring matter, 8.92 per cent.

The drug contained 7.16 per cent. of moisture and 5.35 per cent. of ash. The drug, after exhausting with all the solvents, was found to consist of 49.86 per cent. of cellulin and lignin.

The results of the analysis may be summed up as follows:

Petroleum ether extracted.		1·44	
Ether extracted		1·30	
Absolute alcohol extracted		3·58	
			6·32
Water—	Saccharose	3.29	
	Glucose	1·87	
	Mucilage	3·60	
	Undetermined compounds	3·22	
			11·98
Alkaline solution			3·91
Acid solution			4·36
Chlorine water			8·92
Moisture			7·16
Ash			5·35
Cellulin and Lignin			49·86
Loss			2·14
Total			100·00

In addition to the above, starch was also found, but was not estimated.

This drug contains many of the usual plant constituents, also caoutchouc, and a crystalline glucoside having a slightly bitter taste, and also resembling the taste of the root. This principle is probably identical with the bitter principle observed by Hinchman in 1881, and possibly the same principle observed by Rhoads in 1861. The fluorescence noted in the alcoholic and ethereal solutions I believe to be due to the glucoside found, although I did not obtain it in sufficient quantity to fully establish this fact.

Rhoads and Hinchman also announced the presence of tannin, but I was unable to verify their statement. It was not observed in the course of the regular analysis, and special tests with the powdered drug failed to confirm its presence.

TINCTURE OF MUSTARD.

By JOSEPH W. ENGLAND, PH. G.

Read at the Pharmaceutical Meeting, February 10th.

Internally as an emetic, and externally as a rubefacient, mustard has held popular pre-eminence, as a safe and efficient remedy, from the earliest period; and it is strange to note that, although it has been used with unvarying success in the directions mentioned, any preparations of it have never, apparently, been employed for internal administration.

It is possible that the disinclination to use preparations internally may have arisen through a belief that any such compounds must necessarily partake of its emetic-producing properties. This idea is an erroneous one. It is now recognized that the emetic qualities of ground mustard seeds are dependent for their exciting cause upon the minute particles enveloping, or having adherent to them, particles of the acrid and volatile principles of mustard, which act, mechanically, as local irritants to the mucous membrane of the stomach, and thus cause a revulsive action, and that it is not due to any centric influence.

Believing, then, that mustard in the form of a tincture would possess valuable stimulating properties, the writer prepared, over a year ago, an alcoholic preparation of this drug and urged its medicinal employment, especially in those conditions which are graphically expressed by the term “drunk-cases.” It was found to answer admirably. Possessing the aromatic qualities of ginger and the sharply stimulating properties of capsicum, it combined in one the excellencies of both, without the local irritant feature so characteristic of capsicum. It was found to be stronger than tincture of ginger and less active than tincture of capsicum; standing, apparently, midway in medicinal activity between the two.

Mustard, as is well known, depends for its medicinal activity upon a fixed, acrid oil—acrinyl sulphocyanide, and sulphate of sinapine, in the case of the white seed, and a volatile liquid—allyl sulphocyanide in the case of the black seed. None of these

principles preexist in the seeds as such, but are the results of decomposition by a ferment—myrosin—in the presence of water, of certain proximate principles, sinalbin in the one instance and sinigrin in the other, very much in the same way that amygdalin and emulsin in bitter almonds are broken up when brought in contact with water, to form hydrocyanic acid.

In the preparation of the tincture, the ground commercial black mustard seed which has had the larger portion of its 20-25 per cent. fixed oil removed by pressure, has been used. The formula is as follows:

Take of

Ground black mustard	8 troy-ounces
Water	2 fluidounces.
Alcohol	q. s. ad 1 qt.

Moisten the mustard with the water, added in small quantities at a time, in a porcelain evaporating dish or other non-metallic receptacle, and admix thoroughly. Cover well and leave stand for 24 hours. Remove and pack in a glass funnel or percolator; add 1 pint of alcohol and macerate for 48 hours. Then allow percolation to proceed, keep adding alcohol until the percolate measures 1 quart.

The finished liquid is a clear, transparent, yellow fluid, having a strong characteristic odor and a warm pungent taste. Mixed with water it becomes slightly opalescent or milky from the precipitation of a small quantity of fixed oil. Its dose is from $^1/_4$—$^1/_2$—1 teaspoonful well diluted with water.

Poisoning with oil of sassafras.—A case is related in the *Cincinnati Lancet-Clinic*, December 8,1888, by Dr. L. M. Albright, when a teaspoonful of the oil was taken by a young man, producing hallucinations, vomiting, prostration, cold extremities, low pulse, somewhat dilated pupils and stupor. The treatment commenced two hours after taking the oil, consisted in rest, heat to the extremities, and egg-nog. The patient soon regained consciousness, and was ready for breakfast the next morning.