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- BOTANICAL LABORATORIES, OGDEN SCHOOL OF SCIENCE,  
UNIVERSITY OF CHICAGO.

EUPATORIUM GLUTINOSUM LAM., AN ADULTERANT OF MATICO,  
N. F. (PIPER ANGUSTIFOLIUM RUIZ ET PAVON).\*

BY CLARE OLIN EWING AND JOSEPH F. CLEVINGER.

NOTE.—During the course of the supervision of crude drug inspection, the Pharmacognosy Laboratory frequently examines new or unusual products, which are of such general interest that it seems advisable to make note of them from time to time. This is especially true at the present time when the unsettled war conditions have demoralized the ordinary channels of trade. With the resulting higher prices there has been a tendency toward increased substitution in the cases of crude drugs which are only obtainable with difficulty.

In the past, references to such products have been included in reports submitted to the American Pharmaceutical Association or the Association of Official Agricultural Chemists, or published by the Chief of the Bureau of Chemistry in his Annual Report, or as separate Press Notices or items appearing in the *Service and Regulatory Announcements* of the Bureau. It is now proposed to publish somewhat more detailed notes regarding adulterants, substitutes, or new products which appear of sufficient importance to justify more extended notice than can be accorded them in the brief reports of publications above referred to.—A. VIEHOEVER.

Among recent adulterations which have come to our attention is one which is especially noteworthy, because of the fact that it illustrates how errors may arise through application of unspecific common names to medicinal plants.

The material in question was offered for importation as "Matico Leaves," a

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\* Contribution from the Pharmacognosy Laboratory, Bureau of Chemistry, Department of Agriculture, Washington, D. C.

drug obtained from *Piper angustifolium* Ruiz et Pavon (family *Piperaceae*), a plant indigenous to Peru and Bolivia. Examination of the sample showed it to have been derived from another plant growing in the same regions, namely, *Eupatorium glutinosum* Lamarck,<sup>1</sup> a plant belonging to the family *Compositae*. Dragendorff<sup>2</sup> mentions it as one of the matico plants. Wijk<sup>3</sup> refers to it as the "Matico of the Peruvians." The National Standard Dispensatory<sup>4</sup> also states that among "other leaves to which the name (Matico) has been applied are those of *Eupatorium glutinosum* \* \* \*"

At a first glance the leaves have an appearance somewhat resembling those of matico, due to the fact that both species have leaves scabrous and bullate on the upper surface, but comparison with authentic material readily discloses obvious differences. The leaves of *Eupatorium glutinosum* pack together in rather a gummy, spongy fashion, and are much less brittle than those of the recognized matico. The following tabulation shows the most striking characteristics wherein the sample differed from authentic matico:

Matico.	Matico substitute.
<i>Piper angustifolium</i> Ruiz et Pavon.	<i>Eupatorium glutinosum</i> Lam.
Leaves:	Leaves:
Alternate.	Opposite.
Margin finely crenulate.	Margin serrate.
Base unequal, oblique, subcordate.	Base cordate.
Venation palmate-pinnate, prominent below.	Venation pinnate.
Upper surface scabrous and finely bullate.	Upper surface scabrous and coarsely bullate.
Lower surface pubescent; simple hairs; glandular hairs absent.	Lower surface very wooly, due to numerous, long, simple, much twisted hairs; numerous short glandular hairs.
Subsessile or short-petiolate.	Petiole one to three cm. long.
Length ten to twenty cm.	Length five to fourteen cm.
Breadth two to five cm.	Breadth one to three cm.
Flowers:	Flowers:
Long spikes.	Cymose-paniculate composite heads.
Fruit:	Fruit:
Drupe, reddish brown; containing reddish brown and distinctly reticulate seeds.	Achene; five-angled, truncate; pappus of numerous capillary scabrous bristles.

Inasmuch as we have been unable to find any data in the literature regarding the chemistry of *Eupatorium glutinosum*, the following data obtained with the meager material at our disposal may be of interest:

The amount of extract yielded to petroleum ether was about 14 percent. This is a large percentage for a leaf drug and, together with the large number of glandular hairs, affords an explanation of the manner in which the sample packed together.

While the presence of alkaloids has never been positively reported in any species of *Eupatorium*, Shamel<sup>5</sup> reports some inconclusive tests for the presence

<sup>1</sup> *Encyclopédie Méthodique Botanique*, II (1876), 408.

<sup>2</sup> *Heilpflanzen* (1898), 9, 661.

<sup>3</sup> *Dictionary of Plant Names*, 1911, I, 521.

<sup>4</sup> Hare, Caspari, Rusby: *National Standard Dispensatory*, 1916, 1007.

<sup>5</sup> *American Chemical Journal*, Vol. 14 (1892), 224.

of an alkaloid in the related species *Eupatorium perfoliatum*. Tests for alkaloids made upon a 5 gramme sample of our material, using Wagner's and Mayer's reagents, gave negative results.

Tannins have been reported in a number of *Eupatorium* species and inasmuch as astringent and haemostatic properties are reported for the recognized matico, it was thought that the presence of tannin in the leaves of *Eupatorium glutinosum*, and their consequent use for similar purposes, might account for the term "Matico" having been applied to them. However, not more than a mere trace of tannin could be detected in an aqueous extract from 25 grammes of the powdered leaves.

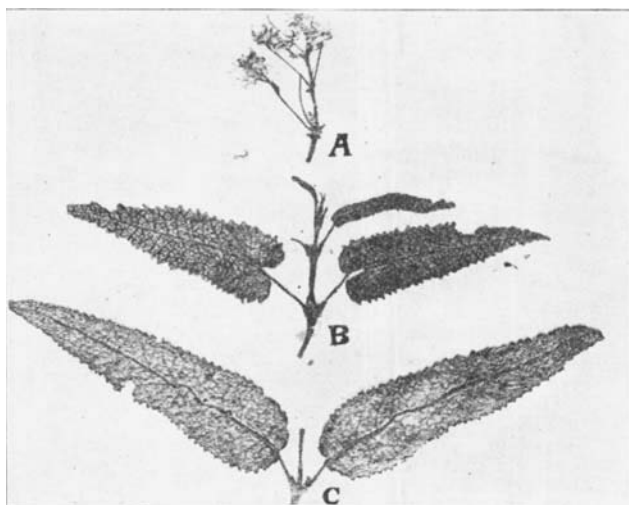


FIG. 1.—EUPATORIUM GLUTINOSUM LAM.

A. Inflorescence; B. Upper surface of leaves; C. Lower surface of leaves.

The taste and flavor of the leaves did not closely resemble those of the recognized matico. A steam distillation showed the presence of about 0.15 percent of a volatile oil resembling in odor that of boneset (*Eupatorium perfoliatum*) of the National Formulary IV (1916). When heated, the oil had a strong odor reminiscent of acetic and a higher fatty acid. It is of interest in this connection that Miller<sup>6</sup> reports the presence of acetic and probably another higher fatty acid in the volatile oil of *Eupatorium capillifolium* (Lam.) Small. Unfortunately, the amount of material available was insufficient to obtain the amount of oil necessary for further work.

#### AN IMPROVED APPARATUS FOR TESTING THE ACTIVITY OF DRUGS ON THE ISOLATED UTERUS.\*

BY PAUL S. PITTENGER.

The importance of biologic assay methods as a means of securing uniformity in the action of drug preparations not amenable to chemical standardization is just beginning to be fully appreciated. The incorporation of a chapter on "Bio-

<sup>6</sup> "A Chemical Study of the Oils of Several Species of *Eupatorium*," E. R. Miller, University of Wisconsin, *Bull.* No. 693, p. 1-41 (1914).

\* Read before the Scientific Section, A. Ph. A., Indianapolis meeting, 1917.