5. Intravenous injections of suspension of fluidextract of cimicifuga produced marked depression of the circulation and respiration.

6. The results of the present investigation afford no scientific basis for the extravagant claims in regard to the therapeutic value of cimicifuga which are found in some of the old textbooks on medical practice and treatment.

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PHARMACOLOGICAL RESEARCH LABORATORY,
HYNSON, WESTCOTT & DUNNING, INC.,
BALTIMORE, MARYLAND.

VEIN ISLETS AS MEANS OF IDENTIFYING DRUGS AND DETECTING ADULTERANTS.*

BY C. J. ZUFALL AND ALLEDA BURLAGE.

If one traces the vein of a leaf as it dwindles in size, he finds that it becomes too small to be seen with the naked eye and finally as he views it under the microscope he finds that it is composed of only one or two vessels which connect with similar branches of other veins. The small area of the leaf enclosed by these smallest branching veins was given the name "vein islet" by Benedict (3).

In some species the vein islet is composed of only a few cells while in others it is composed of many. The size of this area, however, in full-grown leaves, is fairly constant for any species of plant, as shown by Zalenski (1), Shuster (2), Benedict (3), Levin (4) and Ensign (5).

In 1929 Levin (4) used the size of vein islets to distinguish between drugs of closely related species. His work included the several species of Barosma, Erythroxylon, Cassia and Digitalis, and is the most reliable investigation of the subject. This led us to extend the investigation into the detection of adulteration and substitution of other drugs.

The investigators referred to above used various methods of determining the size of the vein islets, most of which were long and quite tedious. Zalenski measured the "combined length of the veins in one square millimetre." Benedict (3) made photographs of the leaves by means of an enlarging camera and counted the vein islets. Ensign showed that Benedict's method was inaccurate because, in uncleared leaves, the chlorophyll hides the minute veins in from 17 to 62 per cent of the cases. Ensign concluded "that any study of leaf venation made from uncleared leaves is wholly unreliable" (5).

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* Scientific Section, Miami meeting, 1931.

Benedict once made the statement that the venation of a full-grown leaf from a young tree differed from that of an older tree. Ensign made studies of the venation in leaves of a grape and of grape fruit which disproved Benedict's statement.

Levin's method was as follows: First, the leaves were cleared with a solution of chlorinated soda and then in chloral hydrate solution; then "at a definite magnification the image of the leaf was projected by means of a series of prisms on to a horizontally placed sheet of paper, upon which a rectangular area representing 4 square millimetres of leaf surface had been traced. The islets which fell within this area were counted and from this figure the average area of one vein islet was determined" (4).

We do not question the accuracy of Levin's method but it is tedious and complicated, and there is a possibility of error.

PROPOSED METHOD OF DETERMINING THE VEIN-ISLET NUMBER.

Two pieces of the leaf were obtained in the following way: Each end of the leaf was cut off at a point one-fourth of the distance from tip to base and discarded; the

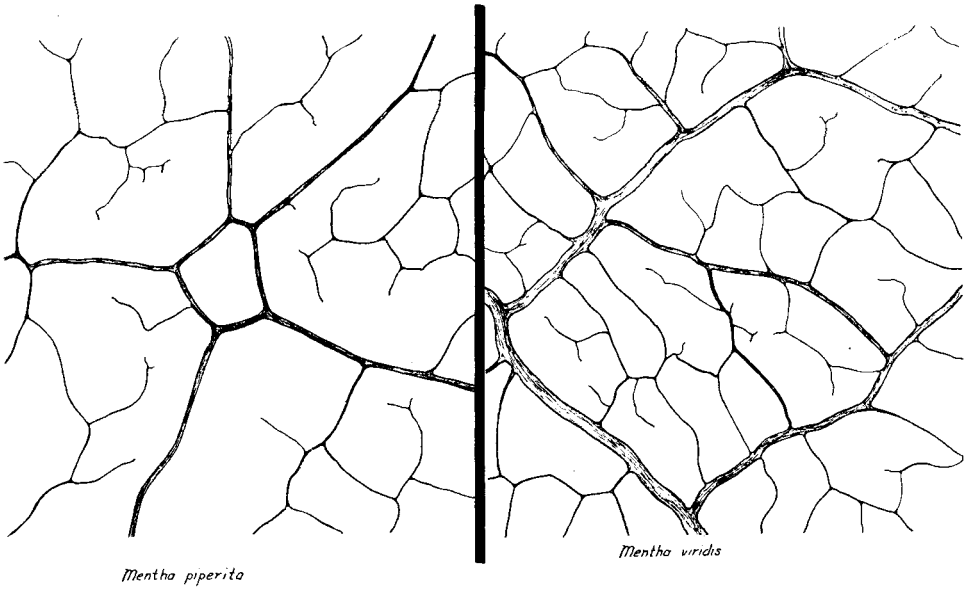

Fig. 1.

piece left was cut down the midrib and from each side a piece was obtained by cutting away one-fourth of the outer edge and one-fourth next to the midrib.

These areas were used because in them the vein islets were found to be more nearly uniform in size. The vein islets next to the midrib are larger than in the other regions, while in the margins of some leaves no vein islets are found. Consequently the above method of discarding the margins and the areas near the midrib avoids the use of the irregular areas.

These pieces were cleared in either chloral hydrate solution or solution of chlorinated soda. Some leaves are cleared more easily than others, so one must determine for each leaf which clearing solution to use. We found that most of the

leaves studied became quite clear by heating in chloral hydrate solution. The leaves may be mounted in the chloral hydrate solution and, since the strip of leaf is often too long for a cover glass, a thin slide may be used to cover it.

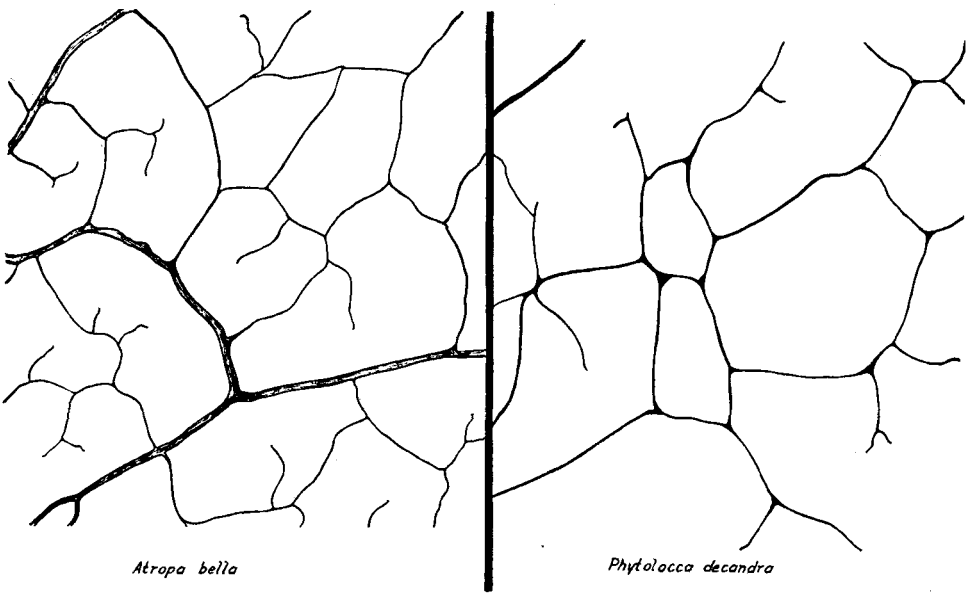

Fig. 2.

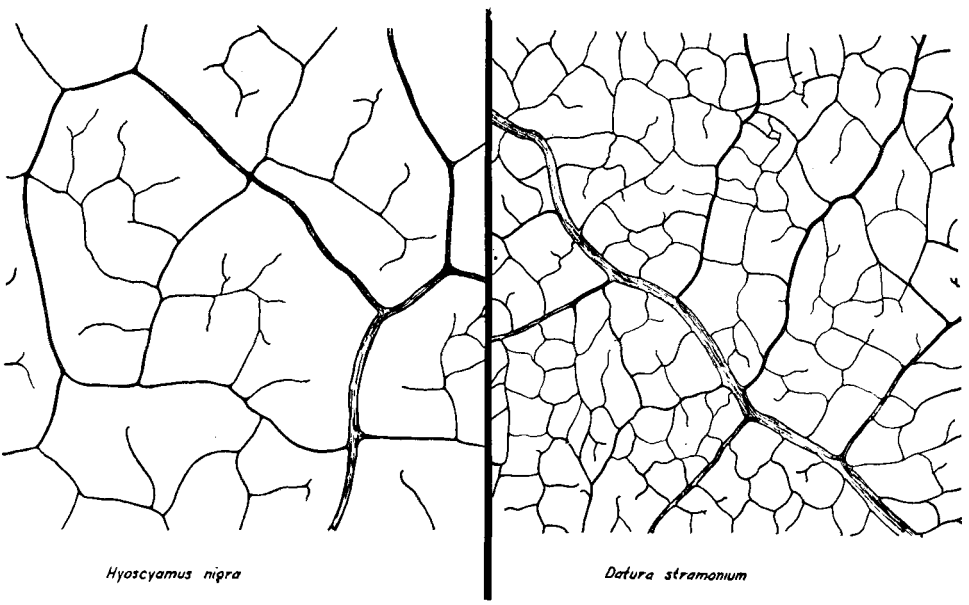

Fig. 3.

The area of the vein islet may be determined by counting the number of vein islets within the field of the 16-mm. objective. The number of vein islets in the field divided by the area of the field in millimetres gives the area of the vein islet.

We found a microscope whose 16-mm. objective gave a field whose area was 2.01 square millimetres. This was near enough the whole number 2, so that the "vein-islet number" could easily be calculated.

The term "vein-islet number" was coined by Levin (4) which he defined as "the number of vein islets in a square millimetre."

In our method we used a mechanical stage and thereby covered the entire piece removed from the leaf. The vein islets in each field were counted, and the average number per field for the leaf determined. The number of fields counted varies from about 20 to 100 per leaf. This number divided by 2 (because the area of our field was 2 square millimetres) gives the number of vein islets per square millimetre or the "vein-islet number." Of course, several leaves of each species were counted in this manner in order to make the determination represent the species.

We believe that this is a simpler, more direct and shorter method than any heretofore suggested for determining the size of vein islets of leaves. It is so simple that undergraduate students in microscopy find no difficulty in using it.

We have applied the vein-islet method to distinguish between the leaves of *Atropa Belladonna* and the leaves of *Phytolacca decandra*. The latter being often used to adulterate the former. The average vein-islet number of Belladonna is 5.27 while that of Phytolacca is 2.57. With the vein islet of Phytolacca twice the size of that of Belladonna, these two leaves can easily be distinguished by this method. The contrast between the two is shown in slide No. 1 which was made from camera lucida drawings, the magnification being the same in each case.

The leaves of Stramonium and Hyoscyamus are often confused. The average vein-islet number of Datura stramonium is 25.7 while that of Hyoscyamus is 11.8. Slide No. 2 shows the contrast between these two.

Slide No. 3 was made from camera lucida drawings of the vein islets of *Mentha piperita* and *Mentha spicata* and shows how this factor can be used to distinguish between the mints. The vein-islet number of *Mentha spicata* was found by us to be 17.8 while that of *Mentha piperita* is 5.78.

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PHARMACOGNOSY LABORATORY,
PURDUE UNIVERSITY SCHOOL OF PHARMACY.

GINSENG EXPORTS FROM UNITED STATES.

Exports of ginseng from the United States, destined principally to China through Hong Kong, gained from approximately 202,800 pounds valued at $1,877,000 in 1930 to 260,500 pounds worth $1,896,000 in 1931. Reports from China indicate a continued large consumption during the past year, fair profits having been realized by local dealers notwithstanding unfavorable exchange. Hong Kong ginseng dealers requested on February 17, 1932, that importers delay deliveries for one month owing to unsettled conditions of the North China market. (Assistant Trade Commissioner David M. Maynard, Hong Kong.)