

results obtained indicate several conclusions. There is very little if any ledum camphor or other stearoptene present in this species, although the season of the year, March, in which it was collected may have an influence. Fractionation points to limited quantity of phenols and aldehydes and little or no dicyclic terpenes, while strongly suggesting the presence of considerable monocyclic. Sesquiterpenes are undoubtedly contained in the oil, as is also the blue hydrocarbon azulene, which has been previously found in milfoil and wild ginger oils.

We are awaiting the opportunity to gather larger quantities of material in order to make a more extended investigation.

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COLLEGE OF PHARMACY,
 UNIVERSITY OF WASHINGTON,
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EXTRACTS OF ACONITUM COLUMBIANUM.

BY O. A. BEATH.

The principal aconite species of the rocky mountain region is *Aconitum columbianum*. While it is widely distributed, its peculiar habitat localizes the plant to shady moist areas.

The plant was investigated by the author primarily for its poisonous properties. Interest in the study suggested a comparison of its therapeutic value with that of U. S. P. drug, the imported species.

Samples¹ were collected at two distinct periods of growth, the first when the plants were well started in their initial growth, *i. e.*, pre-flowering stage, and the second when in full bloom. The tubers (mother and daughter) were separated from the above ground portions in each collection. The method used in the chemical assay was the U. S. P. IX, official for aconite. The following is a summary of the results:

Tubers (flowering)	—0.839%
Tubers (young plants)	—0.774%
Above ground (flowering)	—0.350%
Above ground (young plants)	—0.758%

¹ Identified by Professor Aven Nelson, Botanist, University of Wyoming.

The above ground parts were a mixture of stems, leaves, etc., and in all probability greatly lowered the total percentage of alkaloids because of the coarse stems.

Fluidextracts¹ were prepared (U. S. P. for aconite) from the same plant units as used in the chemical assay and their physiological strength determined. The results of extracts administered subcutaneously follow:

Tubers (flowering).—A dose of 0.010 cc. per Gm. body weight of pig did not kill in 24 hours, but the pig died in 48 hours.

Comparatively non-toxic.

Tubers (young plants).—A dose of 0.010 cc. per Gm. body weight caused only a slight toxic action. The least toxic of the four extracts.

Above ground (flowering).—Dose of 0.010 cc. per Gm. body weight of pig failed to kill, the animal was seriously affected.

Comparatively non-toxic.

Above ground (young plants).—Dose 0.010 cc. per Gm. body weight failed to kill, the animal was seriously affected.

Arranged in the order of activity as indicated by these tests, the tubers from flowering plants appear slightly more toxic than the others, the above ground portions from either growth appear about on a par, while the tubers from young plants were notably weak in their toxic action. All the fluidextracts are less than 0.5% as active as the Standard F. E. aconite, which is recommended in the U. S. P. This, of course, shows the native aconite to be decidedly less active than the imported species referred to as official.

Two tinctures were prepared in 1925, one representing tubers fully matured and the other the seeds. Each was injected subcutaneously into guinea-pigs in doses up to 0.020 cc. per Gm. and failed to kill the pigs. The larger doses were given in concentrations of the original samples so that alcohol would not be a factor. The pigs which received the largest doses were quite sick, the symptoms resembling those of aconite poisoning but they survived. The activity of these samples is, therefore, less than 2% of that of a standard tincture of aconite roots, but may be as strong as 1% of standard. While the tinctures of the mature tubers and seeds gave approximately three times the strength of the sub-mature preparations, yet it is to be observed that the mature parts of the aconite are still greatly under the official tincture requirements.

Alkaloidal assays of the 1925 collection were omitted. Inasmuch as the chemical assays of aconite have little or no significance there did not appear to be justifiable reasons for checking on the later samples.

As mentioned above, *Aconitum columbianum* occurs quite widely distributed in the Rocky Mountain region and economically is classed as a poisonous plant, referable to livestock. Our research laboratory has been interested primarily in the plant's effect upon range animals rather than its possible utilization as a source of aconite products. While most investigators refer to this species as a poisonous plant, yet stock losses are negligible, undoubtedly because of its being comparatively non-toxic.

¹ Biological assay made by the research laboratory of Parke, Davis & Company, Detroit.