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THE POTENCY OF OREGON DIGITALIS.*[1]

(A PRELIMINARY INVESTIGATION.)

BY DONALD KUO-CHIH LEE AND ERNST T. STUHR.[2]

INTRODUCTION.

The literature reveals considerable conflicting evidence relative to physiological activity of cultivated and wild growing foxglove (1, 2, 3, 4, 5, 6, 7, 8, 9) and age of the foliage (10, 11). These contradictions prompted the investigation of the native growing Oregon plants.

Foxglove grows wild throughout the Pacific slope region from Vancouver Island to California. In Oregon it is abundant along the western part of the state, but more especially in Lincoln and Coos counties.

The results here presented are from a seasonal study of wild growing Oregon digitalis, *Digitalis purpurea* L.

Procedure.—Monthly collections were made of both first- and second-year leaves during the spring and summer of 1932–1933. Tinctures were prepared in accordance with U. S. P. specifications. The fat-free preparations were placed in glass-stoppered amber-colored bottles and stored in a cool place in order to retard deterioration (12, 13, 14).

The resulting preparations were biologically assayed by the official "one-hour" frog method (15). Throughout the experiments only healthy frogs of the species *Rana pipiens* (common "grass" or "leopard" frogs) weighing 20–35 Gm. were used. Temperature was kept constant (20° C.) The degree of sensitiveness of the frogs was ascertained, using ouabain solution as a standard. Series of standardized frogs were used in assaying the respective tinctures for each particular age and month's collection of digitalis leaves.

An attempt was made to correlate physiological activity with seasonal glucosidal content by the proposed colorimetric method of Knudsen and Dresbach (16).

* An abstract based upon a thesis by Donald Kuo-Chih Lee submitted to the Graduate Faculty of the Oregon State College in partial fulfilment of the requirements for the degree of Master of Science.

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Results.—The seasonal study of wild growing digitalis revealed that the first-year leaves of the December collection were equivalent in potency to the April collection of first-year leaves.

Collections.	*Relative Potency of Preparations (Tr. Dilution 1: 5).
First-Year Plants.	
November	38.46
April	38.46
June	85.71
Second-Year Plants.	
November	30.00
June	85.71
July	100.00

* Determined by comparison with ouabain as standard (Dilution—1:10,000). Apparently there is very little difference in the physiological activity of the first- and second-year plants during June.

CHEMICAL ASSAY.

A chemical determination of the active principles was attempted on the monthly samples. The method used was the colorimetric method proposed by Knudsen and Dresbach (16).

Tinctures Tested.	Readings in Mm.	Number of Mg. in a Cat Unit (17).
November:		
First-year plants	38	190
Second-year plants	42	210
December:		
First-year plants	31	155
April:		
First-year plants	33.2	166
June:		
First-year plants	24.0	120
Second-year plants	26.3	131.5
July:		
First-year plants	20.6	103
Second-year plants	22.8	110.4

Considerable difficulty was experienced due to the inability of comparing the intensity of the tinctures with the standard solution. Several attempts were made but we were not able to get any close results. The standard ouabain solution had a dark yellowish color but the tincture remains a light greenish in color, even after the addition of the neutral lead acetate solution and the alkaline picrate solution. The greenish tint of the tincture is no doubt due to the pigment (chlorophyll) of the digitalis leaves. The volume of neutral lead acetate solution called for in the method was either insufficient or the Oregon digitalis has a greater content of chlorophyll than that which Knudsen and Dresbach experimented with. As it was impossible to compare the intensity of the color of the two solutions, readings were made by attempting to measure the color tints of the two solutions.

CONCLUSIONS.

1. The physiological activity of the first-year leaves compared favorably with the second-year leaves.

2. The activity of native digitalis plants under favorable climatic conditions would probably be above U. S. P. standard.

3. One-hour frog method unsatisfactory chiefly because of the time element which has a tendency toward erratic results.

4. Observed only a slight difference in the susceptibility of frogs to cardiac stimulants through the various seasons.

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STUDIES ON THE BIOASSAY OF DIGITALIS.*,[1]

III. A NEW DIURETIC OLIGURIC CAT METHOD.

BY JAMES H. DEFANDORF.

Digitalis in toxic amounts has a peripheral constrictor effect on the blood vessels of the kidney in animals (2, 8, 13, 17) which, together with its weakening effect on the circulation, results in a decreased output of urine (oliguria). Since digitalis has a cumulative action, oliguria should follow the repeated administration of small doses and the effect observed by measuring the urine output at short

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* Scientific Section, A. PH. A., continued from Madison meeting, A. PH. A., 1933.

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