TINCTURE OF CAPSICUM.

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EFFECT OF VARIATIONS OF ALCOHOLIC STRENGTH OF MENSTRUUM AND RATE OF PERCOLATION ON THE QUALITY OF THE TINCTURE OBTAINED.

Seven Tinctures of Capsicum were prepared from the same lot of drug, using different menstrua, macerating for different periods and percolating at various rates of flow in an effort to determine the best menstruum and procedure for percolation. The experiments were conducted as indicated in the following table, 1000 cc. of tincture being made from 100 Gm. of drug in each case.

TABLE I.—TINCTURE OF CAPSICUM.

Experiment.	Menstruum.	Percolate Collected.	Time of Maceration.	Rate of Percolation.
A	Alcohol 95 vol. Water 5 vol.	1000 cc.	24 hours	0.5 cc. per min.
B	Alcohol 9 vol. Water 1 vol.	1000 cc.	24 hours	0.5 cc. per min.
C	Alcohol 4 vol. Water 1 vol.	1000 cc.	24 hours	0.5 cc. per min.
D	Alcohol 95 vol. Water 5 vol.	1000 cc.	3 hours	4.0 cc. per min.
E	Alcohol 4 vol. Water 1 vol.	1000 cc.	3 hours	4.0 cc. per min.
F	Alcohol 9 vol. Water 1 vol.	750 cc. (Made up to 1000 cc. by addition of alcohol.)	3 hours	4.0 cc. per min.
G	Alcohol 4 vol. Water 1 vol.	450 cc. (Made up to 1000 cc. by addition of alcohol.)	3 hours	4.0 cc. per min.

Organoleptic (taste) tests were run on each tincture in order to determine the comparative strength. The tinctures are listed as follows in the order of their relative pungency and the dilutions necessary to yield solutions of equal pungency and the % strength figures for pungency are also given, based on rating tincture C as 100%. Determinations were also made for the amount of total solids in the tinctures and the per cent of fat in the dried marcs.

TABLE II.

Tincture.	Required Dilution for Equal Pungency.	% Strength (C = 100).	Total Solids in Tinctures.	% Fat in Dried Marcs.
C	1—2380	100.00	0.2447 Gm.	1.26
B	1—2325	97.69	0.2150 Gm.	1.07
D	1—2175	91.39	0.2044 Gm.	0.910
A	1—2000	84.03	0.1991 Gm.	0.888
F	1—2000	84.03	0.1915 Gm.	2.25
G	1—1900	79.83	0.1907 Gm.	2.22
E	1—1780	74.79	0.1796 Gm.	1.45

The dried marcs were tasted in order to note if pungent principles remained after extraction. It was found that D, F, G had retained some pungency, F being more pungent than G, and G more than D. No evidence was available which would explain why no pungent sensation was produced by marcs A and E, as tincture A was the same as F and tincture E was less than F and G in % strength, which would indicate that all of the pungent principles had not been extracted.

In the color comparison carried out, the tinctures were rated according to their relative depths of color, starting with the darkest tincture: C, E, B, D, F, G, A. This does not coincide with the order of rating based on either total solids or pungency. It shows color is extracted almost as well with a weaker alcoholic menstruum, brief maceration, and rapid percolation as under conditions which yield more complete extraction of the active principles; the weakest tincture in the above table taking second place in color intensity. However, the variation in color between the several tinctures was not great and no change was noticeable therein, after standing 10 months at room temperature in amber bottles.

The following results were obtained from the periodic examinations of the tinctures of sediment. The sediment in each sample had about the same physical properties, being very fine and white.

TABLE III.—SEDIMENTATION OF TINCTURES.

	Age of Tinctures at Observation.					
	1 Month.	2 Months.	3 Months.	4 Months.	6 Months.	10 Months.
Tincture C	++	++	+++	+++++	+++++	++++++
Tincture B	—	—	+	++	++	+++
Tincture D	—	—	++	+++	+++	++++
Tincture A	+	++	++	+++	+++	+++
Tincture F	+	+	+	+	+	++
Tincture G	—	+	+	+	+	+
Tincture E	++	++	+++	++++	++++	+++++

— indicates no sediment.

+ indicates slight sediment which is the least.

++++++ indicate the most sediment. The difference between the two extremes is not great.

When the tincture was disturbed the sediment became suspended throughout the tincture. Most of it was ether soluble, but practically insoluble in a mixture of alcohol, 4 vol.—water, 1 vol. After the sediment in bottom of the bottle was subjected to treatment with ether and later with alcohol, 4 vol.—water, 1 vol., some of it still remained, it not being soluble in either solvent. The ether solution was clear, and on evaporation left a gray, greasy residue.

CONCLUSIONS.

1. A menstruum of alcohol, 4 vol.—water, 1 vol. is most effective in extracting the pungent principles.

2. Adequate maceration and slow percolation is necessary for complete extraction.

3. All tinctures made in the experiments discussed showed slight sediment on standing 10 months, consisting mostly of fat. The quantity present in any tincture is very small, careful examination of the product being required to disclose its presence.

4. Less effective extraction methods also extracted less fat, yielding tinctures showing slightly less sedimentation on aging.

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