

# CHROMATOGRAPHIC DIFFERENTIATION OF DRUGS, ARUM DRACONTIUM, ARUM MACULATUM, AND ARUM TRIPHYLLUM

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## INTRODUCTION

The plant Arum is a perennial herb belonging to family Araceae. It is indigenous to the United States of America and Canada. Three species of the plant namely *Arum dracontium*, *A. maculatum* and *A. triphyllum* are used in Homocopathy for different clinical conditions. *A. dracontium* is used in pharyngitis and as expectorant. *A. maculatum* is used in inflammation, ulceration of mucus membranes, nasal polypus, as anti-irritant for nose and eyes and in catarrh. *A. triphyllum* is used for chronic sore throat and in glandular swellings. It has limited coverage over diphtheria and enteric fevers. Homoeopathic preparations are made from roots of individual species, *A. dracontium*, *A. maculatum* and *A. triphyllum* using alcohol-water extracting solvent having 50%, 60% and 60% alcohol respectively.

Even when they are established as different drugs clinically, not enough work has been done so far towards differential pharmacognostic or chemical identification of the drugs or their tinctures.

*Arum maculatum* (whole plant) is reported to contain amines and cyanogenetic compounds; leaves contain a little nicotine, traces of other alkaloids, considerable amount of ethylamine, isobutylamine and isoamylamine. Flowers are reported to contain  $\alpha$ - &  $\beta$ -carotene, lycopene, lutein, diaposy- $\beta$ -carotene. Enough work has not been done so far on *A. dracontium* and *A. triphyllum*.

## MATERIALS AND METHODS

The plant material was air dried; 100 g of each of the coarsely powdered drugs was placed separately in alcohol water mixture. In case of *A. dracontium* in 50% alcohol and both *A. maculatum* and *A. triphyllum* in 60% alcohol. They were kept for 24 hours and then percolated out and made up to 1000 ml in each case by the solvents of the same strength. (For the present study the tincture of *A. dracontium* was obtained from Boericke & Tafel, Philadelphia, U.S.A.). 100 ml of the extracts of the above three plants were evaporated on water-bath to remove alcohol. The remaining aqueous portions were divided into two parts. One part of each was made alkaline with ammonia solution and then extracted with chloroform (25 ml). The chloroform layers (A-1, A-2, A-3) were separated and chromatographed for alkaloids.

The second aqueous portions were extracted with chloroform (25 ml) as such and the separated chloroform layers (B-1, B-2, B-3) from aqueous

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TABLE  
CHROMATOGRAPHIC RESULTS OF ARUM SPECIES

S.No.	Name of plant	Chloroform extract (A)	Chloroform extract (B)		Aqueous extract (C)	
		Solvent—benzene : methanol (95:5 v/v); spray reagent iodoplatinate	Solvent same as (A); spray reagent antimony trichloride soln. U.V.		Solvent—n-butanol: acetic acid: water (4:1:1 v/v); spray reagent 1% aluminium chloride	
1.	<i>Arum dracontium</i>	0.53 violet spot	0.13 0.15	0.15 violet	0.45 0.60 0.70 0.92	blue F yellow F blue F yellow F
2.	<i>Arum maculatum</i>	—	0.13 0.15 0.92	0.36 (violet) 0.60 (violet) 0.70 (blue)	0.45 0.70 0.92	blue F blue F yellow F
3.	<i>Arum triphyllum</i>	0.45 violet spot	0.13 0.15 0.35 0.92	0.02 0.36 (violet) 0.70 (blue)	0.45 0.60 0.70 0.92	blue F yellow F blue F yellow F

F = Fluorescence

layers (C-1, C-2, C-3) were also chromatographed. The chromatography was done on silica gel 'G' plate (200  $\mu$ , 30 x 10 cm, B.D.H.) using benzene: methanol (95:5 v/v) as mobile phase for chloroform extracts of series A & B and n-butanol: acetic acid: water (4:1:1 v/v) for aqueous layers of series C and sprayed with iodoplatinate reagent for series A, saturated solution of antimony trichloride in chloroform for series B and 1% alcoholic aluminium chloride solution for aqueous layers of series C.

#### RESULTS AND DISCUSSION

The chloroform layers of series A gave one violet coloured spot of Rf. 0.53 in case of *A. dracontium* and at Rf. 0.45 in *A. triphyllum* with iodoplatinate reagent, whereas *A. maculatum* did not give any such spot.

The chloroform layers series A & B of all the three *Arum* species gave two common spots at Rf. 0.13 and 0.15 under long wave UV light but *A. maculatum* gave one additional spot at Rf. 0.92 and *A. triphyllum* gave two additional spots at Rf. 0.35 and 0.92. On spraying the plates with antimony trichloride reagent one violet coloured spot at Rf. 0.15 in case of *A. dracontium*, three spots at Rf. 0.36 (violet), 0.60 (violet) and at 0.70 (blue) in case of *A. maculatum* and three spots at Rf. 0.02 (violet), 0.36 (violet) and 0.70 (blue) in case of *A. triphyllum* appeared.

The aqueous extracts of series C of all the three *Arum* species gave three common spots at Rf. 0.45 (blue fluorescence), 0.70 (blue fluorescence) and 0.92 (yellow fluorescence), but *A. dracontium* and *A. triphyllum* gave one additional spot at Rf. 0.60 (yellow fluorescence) whereas *A. maculatum* did not give that spot.

From the above discussion it is concluded that all the three *Arum* species, viz. *A. dracontium*, *A. maculatum* and *A. triphyllum* can easily be differentiated chromatographically.

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#### REFERENCES

1. *The Homoeopathic Pharmacopoeia of the United States*, Boericke & Tafel, Philadelphia (1964), 131-134.
2. Clarke, J. H.: *A. Dictionary of Practical Materia Medica*, Jolly Friends Homoeopathic Study circle, Dethi (1975), 196-199.
3. Boericke W.: *Homoeopathic Materia Medica*, B. Jain Pub., N. Delhi (1981), 87.
4. Trease, G. E., and Evans, W. C.: *Pharmacognosy*, XI Ed., Bailliere Tindall, London (1978), 338.
5. Stahl, E., and Kaltenbach 4: *Arch. Pharm.* 298 (a), 599-603.
6. Pennock, J. E., Hemming, F. W., and Morton, R.: *Biochem. J.* (1962), 82, 11.
7. Vatadon, L. R. G., and Nummery, R. S.: *Z. pflanzenphysiol* (1975), 75(1), 88-94.