CONTRIBUTIONS TO THE CHEMICAL STUDY OF SOME *PAPAVERACEAE* SPECIES CAPSULES. N.II. *GLAUCIUM FLAVUM*, *GLAUCIUM CORNICULATUM* AND *CHELIDONIUM MAJUS*

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Abstract: The study of the composition of the isokynolic alkaloids of the capsules of some Papaveraceae that are close taxonomically, like the genus *Glaucium* and *Chelidonium* comes to complete the data obtained from a previous study on another genus (*Papaver*). The investigation of the alkaloidic spectrum of the species *Glaucium flavum*, *Glaucium corniculatum* and *Chelidonium majus* by thin-layer chromatography (CSS) on SiO_2 as absorber and the solvent systems: $CHCl_3$-MeOH (85:15), C_6H_6-EtOH (9:1), $CHCl_3$-MeOH (1:1) and cyclohexane-dyethylamine (9:1) emphasized a complex chemical composition. We also poerformed the determination of the brute proteins in the fruits of the examined species by Kjedahl proceeding. The results emphasized the greatest content in ***Glaucium flavum*** followed by ***Chelidonium majus.***

INTRODUCTION

In a first note, we studied the alkaloid composition of the capsules of some species of *Papaver* sampled both from the culture (*Papaver somniferum*) and from the spontaneous flora (*Papaver rhoeas* and *Papaver dubium*). Going on with the study, we also examined the capsules of some other related *Papaveraceae*, of the genus *Glaucium* (*Glaucium flavum* and *Glaucium corniculatum*) and *Chelidonium* (*Chelidonium majus*). To this purpose, we used the thin-layer chromatography, following both tertiary and quaternary alkaloidic bases. The second purpose of the paper was the brute proteins dosage from the fruits (capsules) of the examined species.

MATERIAL AND METHODS

The capsules of the species of *Papaveraceae* studied were sampled in the summer of 2002 as it follows:

- *Glaucium flavum* from culture (Iaşi Botanical Garden)
- *Glaucium corniculatum* and *Chelidonium majus* of the spontaneous flora of the surroundings of Iaşi.

From every plant, two types of extracts were prepared: **metanolic** and **dychlormethanic**. To this purpose, 5 g of every vegetal product were weighted, crushed, powdered and then treated in two ways:

- with methanol (5 x 50ml) by repeated shaking, when the **methanolic extract** was obtained
- with dychlormethane (5 x 50ml) in alcaline environment (NH_3) by repeatyed shaking, when the **dychlormethan extract** was obtained

At thin-layer chromatography (CSS) ready-made Merck plates of silicagel were used and the following solvent systems:

- $CHCl_3$-MeOH (85:15),$CHCl_3$-MeOH (1:1),$CHCl_3$-MeOH (10:1),cyclohexane-dyethylamine (9:1),C_6H_6-EtOH (9:1).

The chromatograms were seen first by examining in UV at $\lambda = 365$ nm and then by powdering with Dragendorff reagent.

Using 2 g material vegetal dryness on 60˚ C, crushed, powdered for the determination of the brute proteins in the capsules by Kjedahl proceeding.

RESULTS AND DISCUSSIONS

Analyzing the obtained chromatographic images, we could see that there was a number of 12-13 alcaloidic spots for *Glaucium flavum*, 18 for *Glaucium corniculatum* and 13 for *Chelidonium majus*.

As solvent system used for the general screening, we noticed the mixture of $CHCl_3$-MeOH (85:15) on a layer of SiO_2 (fig. 1).

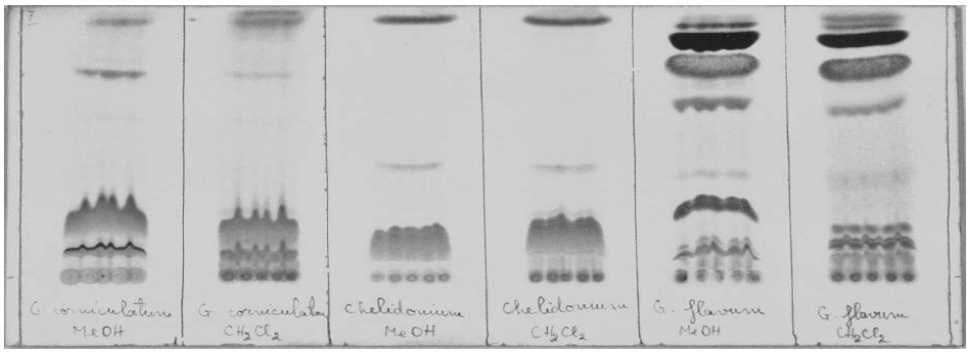

Fig. 1 Si O_2 G Merck 10x20, $CHCl_3$-– MeOH (85:15), R.Dragendorff

In the case of the *Glaucium flavum* we identified by means of the reference substances the alkaloids: glaucine, chelidonine, stilopine, protopine, allocryptopine and magnoflorine. All the four tested solvent systems proved to be useful (fig. 2), yet an optimal separation of the pair glaucine-chelidonine is obtained when the mixture C_6H_6-EtOH (9:1) is used, and also when the mixture $CHCl_3$-MeOH (85:15) is used, even if the separation is not as good as in the first case (fig. 3).

Using the solvent system $CHCl_3$-MeOH (1:1) on SiO_2, specific for the quarternary bases, in the metanolic extract of the fruits of *Glaucium flavum* we could see the presence of the magnoflorine and of another alkaloid with close R_f. We can also see clearly the absence of the quarternary protoberberins of the fruits of *Glaucium flavum*.

Passing to *Glaucium corniculatum* we identified via the reference substances the following alkaloids: glaucine, chelidonine, protopine, allocryptopine and coptizine. Of the used solvent systems, we noticed the one formed by C_6H_6-EtOH (9:1) (fig. 4). As to the fraction of the quarternary protoberberinic bases, we noticed their presence and the separation of a number of five spots with yellow fluorescence at various shades in the UV light upon the use of the solvent systems $CHCl_3$-MeOH (1:1). Of these alkaloids, we could identify only the coptisine via the reference substance.

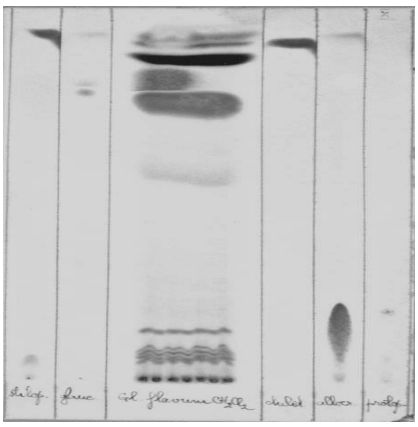

Fig.2 Si O_2 G Merck 10x20, $CHCl_3$– MeOH (10:1), R.Dragendorff

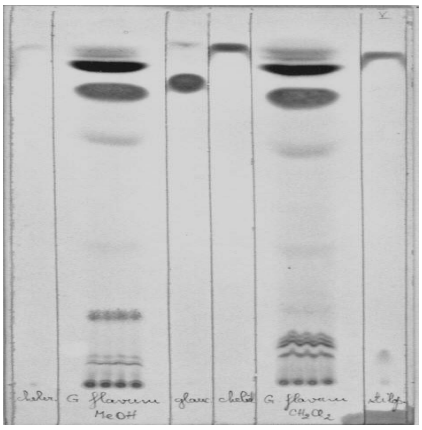

Fig.3 Si O_2 G Merck 10x20, $CHCl_3$-– MeOH (85:15), R.Dragendorff

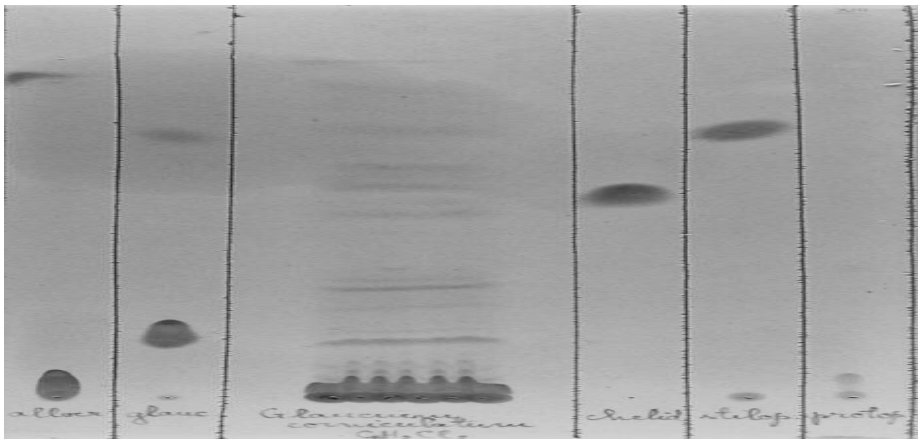

Fig.4 Si O_2 G Merck 10x20, C_6H_6-EtOH (9:1), R.Dragendorff

Chelidonium majus, species that is quite close to the plants of the *Glaucium* genus if we consider particularly the chemotaxonomic characters, distinguishes itself by the high concentration of the quarternary protoberberins. Using the same solvent system, $CHCl_3$-MeOH (1:1) on SiO_2 we could distinguish a number of 4-5 spots with yellow fluorescence of various shades upon UV examination. We identified the coptisine and the berberine, the first alcaloid prevailing.

Using the 3 solvent systems used also in the case of the *Glaucium* species, we could identify by the behavior as to the reference substances the following tertiary alkaloids: stilopine, chelidonine, protopine, allocryptopine, sanguinarine and cheleritrine. We noticed a considerable amount of stilopine and low amounts of the quarternary benzo-(c)-fenandrinic cuaternare bases, sanguinarine and cheleritrine.

Upon the use of the solvent systems $CHCl_3$-MeOH (1:1) on SiO_2 we also noticed for the extracts from the fruits of *Chelidonium majus* the presence of the coline, as well.

Comparing our results with the results obtained by R. Lavenir and R. Paris as to the alkaloid composition of the fruits of *Chelidomium majus*, we have to show that they agree as to the presence of the stilopine in considerable amounts, yet the quantitatively prevailing alkaloid in our case is the coptisine. This alkaloid was not noticed by the French authors probably because of the stressed hydrosolubility of the quarternary protoberberinic bases, upon alcalizing and extraction with non-polar solvents as they remain in the mother waters,m unlike the tertiary alkaloids.

The second purpose of the paper was the brute proteins dosage from the fruits of the examined species by Kjedahl proceeding (Table 1).

Table 1- The determination of the brute proteins in the fruits of the species *Glaucium flavum* and *Chelidonium majus*

Nr. crt.	Species	G medie probe (g)	VmNaOH 0,1 n (ml)	Vp NaOH 0,1 n (ml)	V m -Vp	N total (g N/100 g material dryness on air)	brute proteins (g)
1.	*Glaucium flavum*	0,2699	6,95	6.59	0.35	0.1847	1.1549
2.	*Chelidonium majus*	0,2699	6,95	6.72	0.22	0.1167	0.7294

The results emphasized the greatest content in *Glaucium flavum* (1,15%), followed by *Chelidonium majus* (0.72%) (Fig.5).

Fig.5 Brute proteins dosage from the *Glaucium flavum* and *Chelidonium majus* capsules

CONCLUSIONS

Using the thin-layer chromatographic analysis of silicagel and solvent systems $CHCl_3$-MeOH (85:15), C_6H_6-EtOH (9:1), $CHCl_3$-MeOH (1:1) and cyclohexane-dyethylamine (9:1) were identified in the fruits of *Glaucium flavum*, *Glaucium corniculatum* and *Chelidonium majus* the alkaloids: chelidonine, protopine, allocryptopine.

The alcaloids stilopine and coptisine were noticed only in *Chelidonium majus* and *Glaucium corniculatum*, and the glaucine only in the species of *Glaucium*.

Sanguinarine, cheletrine and coline could be identified only in the fruits of *Chelidonium majus*, and magnoflorine only in those of *Glaucium flavum*.

We also notice the presence of the quarternary protoberberines in *Chelidonium majus* and *Glaucium corniculatum* and their absence from *Glaucium flavum*.

The results emphasized the greatest content in brute proteins in *Glaucium flavum* followed by *Chelidonium majus*.

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