

Alkaloid Screening of Some Saudi Arabian Plants

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사우디아라비아産植物의 알카로이드檢索

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The alkaloid fraction was separated from the methanol extract of 13 Saudi Arabian plants. The R_f values of the spots appeared on TLC (silicagel G) plates were calculated with each alkaloid fraction. The results are presented in this paper.

The medicinal plants resources of the Kingdom of Saudi Arabia was investigated as a part of the exploitation program of the plants growing in deserts¹⁾. Forty three plant samples were collected from Eastern Najd (Riyadh, Horaimela) South Hijaz (Jedda, Taif) and oceanic dessert areas and results of the phytochemical²⁾ and biological³⁾ screening were already reported.

The alkaloid fraction was separated from the methanol extract of the plant which showed positive reactions to alkaloid detecting agents (Wagner, Mayer and Hager's reagents).

This paper reports the R_f values of the spots appeared on TLC (silicagel G) plates with each alkaloid fraction. Three different developing solvent systems were used and several different alkaloid detecting methods were applied.

Experimental

Preparation of the alkaloid fraction

Plants were air dried and extracted with 90% methanol. The extract were concentrated in vacuo to dryness. The dried extract was dis-

solved in 2N-HCl solution on a water bath. After cooling to room temperature, a small amount of celite was added. This mixture was briefly shaken and filtered. The filtrate was then made alkaline to litmus paper with 5% NH₄OH and extracted twice with chloroform. The chloroform solution was combined and dried with anhydrous Na₂SO₄. The solvent was evaporated under the vacuo.

Preliminary alkaloid tests

The alkaloid fraction of the extract was dissolved in 2N-HCl and divided into three portions. The following reagents were added to each portion. If the addition of either reagent produced turbidity or precipitation the result was considered positive.

1) Wagner's reagent: dissolve 1.358g of HgCl₂ in 60ml of water. Dissolve 5.0g of KI in 10ml of water. Mix the two solutions and add water to make 100ml.

2) Mayer's reagent: dissolve 2.0g of KI in 5ml of water. Add 1.27g of iodine, stir until dissolved, and add water to make 100ml.

3) Hager's reagent (saturated aqueous picric

Table I. Rf Values of Alkaloidal Components of Saudi Arabian Plants.

Plant names	Used part	Rf Values				Preliminary alkaloid test		Alkaloids previously reported	Serial No.
		BHH	BH	AB	Wagner.	Mayer.	Hager		
Apocynaceae									
<i>Rhazya stricta</i>	hb.	0.04(I,D)	0.15(F,I,D)	0.03(I,D)	+	+	+	Rhazine ⁴ , Rhazinine ^{5,6)}	S-15
		0.16(I,D)	0.19(F,I,D)	0.05(F,I,D)				Quebrachamine ⁷⁾	
		0.19(F,I,D)	0.26(F,I,D)	0.08(I,D)				1,2-dihydrospidospersmidine ⁷⁾	
		0.34(F,I,D)	0.31(I,D)	0.11(F,I,D)				Aspidospersmidine ⁷⁾	
		0.37(I,D)	0.37(F,I,D)	0.13(I,D)				Eburnamonine ⁷⁾	
		0.41(F,I,D)	0.42(F,D)	0.29(D)				Eburnamenine ⁷⁾	
		0.47(I,D)	0.46(F,I,D)	0.33(F,I,D)				Sewarine ¹⁴⁾	
		0.53(F,I,D)	0.52(F,D)	0.38(F,I,D)				Rhazidine ¹⁵⁾	
		0.57(F,I,D)	0.56(F)	0.45(F,I,D)				1,2-Dehydrospidospersmidine ¹⁶⁾	
		0.73(I,D)	0.59(I,D)	0.55(D)				Vincadifformine ¹⁶⁾	
		0.84(F)	0.80(F)	0.65(D)				Rhazinaline ¹⁷⁾	
				0.69(F,I,D)				Geissoschizine ¹⁷⁾	
				0.84(F,I,D)					
Asclepiadaceae									
<i>Leptadenia pyrotechnica</i>	Wp.	0.11(F)	0.10(F,I,D)	0.03(I)	+	-	+		S-37
		0.13(I,D)	0.16(I,D)	0.07(I,D)					
		0.15(I,D)	0.53(F)	0.72(F)					
		0.18(F)	0.57(I,D)	0.96(I,D)					
		0.60(F)	0.63(I)	0.80(F,I)					
		0.82(F,I,D)	0.68(F)						
		0.46(F)	0.45(F)	0.47(I)	+	+	+		
<i>Pergularia tomentosa</i>	hb.	0.51(F,I)	0.49(F)	0.58(I,D)					S-12
		0.64(F,I,D)	0.52(I,D)	0.66(F)					
		0.80(F,I)	0.56(F)	0.72(D)					
			0.66(F,I,D)	0.78(F,I)					
			0.72(D)						
		0.80(D)							

Plant names	used part	Rf Values			Preliminary alkaloid test		Alkaloids previously reported	Serial No.
		BHH	BH	AB	Wagner.	Mayer. Hager		
Chenopodiaceae								
<i>Beta vulgaris</i>	If.	0.23(F) 0.29(F,D) 0.38(I,D) 0.82(F) 0.98(I,D)	0.20(F,D) 0.33(I,D) 0.52(F) 0.80(I,D)	0.08(F,I) 0.22(I,D) 0.88(F,I,D)	+	-	Vulgaxanthin ⁹⁾ Allantoin ⁹⁾	S-29
<i>Salsola</i> sp.	wp.	0.31(F) 0.50(F) 0.61(I,D) 0.75(I) 0.89(I)	0.55(I,D) 0.74(I)	0.80(I,D)	+	-	Salsoline ¹⁰⁾ Salsolidine ¹¹⁾ Calycotomine ¹²⁾	S-43
Cruciferae								
<i>Farsetia aegyptica</i>	wp.	0.28(F) 0.48(F) 0.96(F,D)	0.65(F) 0.85(F)	0.30(F) 0.81(I)	±	-		S-34
Gramineae								
<i>Aeluropus littoralis</i>	wp.	0.27(F) 0.43(F) 0.49(F) 0.59(I,D) 0.77(F,I) 0.96(F,I)	0.00(F) 0.19(F) 0.43(I,D) 0.63(F,I)	0.25(F) 0.39(I) 0.79(F,I)	±	-		S-23
Labiatae								
<i>Lavandula coronopifolia</i>	wp.	0.11(F,I,D) 0.22(F,I,D) 0.84(F) 0.98(I,D) 0.19(I,D)	0.00(F) 0.13(F) 0.20(F) 0.62(F) 0.02(F)	0.00(F) 0.26(F) 0.40(F) 0.74(F) 0.00(F,D)	+	-		S-21
<i>Salvia spinosa</i>	wp.	0.23(F) 0.32(F) 0.45(F) 0.90(F)	0.19(I,D) 0.40(F) 0.43(I) 0.65(F)	0.15(F) 0.20(I,D) 0.23(I) 0.41(I,D)	+	-		S-40

Plant names	used part	Rf Values			Preliminary alkaloid test		Alkaloids previously reported	Serial No.
		BHH	BH	AB	Wagner.	Mayer. Hager		
Malvaceae								
<i>Abutilon pannosum</i>	hb.	0.63(I,D) 0.97(F,I,D)	0.48(I,D) 0.71(F)	0.55(I,D) 0.72(F,I) 0.83(I)	+	+	±	S-22
Papaveraceae								
<i>Argemone mexicana</i>	hb.	0.11(F) 0.15(F) 0.46(F,I,D) 0.56(I,D) 0.59(F,I,D) 0.98(I)	0.28(F,I,D) 0.35(F,I,D) 0.46(F,I,D) 0.93(F,I)	0.02(F) 0.15(F,I,D) 0.26(F,I,D) 0.78(F) 0.85(F)	+	+	+	S-25
Plumbaginaceae								
<i>Limonium axillare</i>	wp.	0.63(I,D) 0.80(F,I) 0.85(I,D)	0.35(F) 0.47(I,D) 0.66(I) 0.75(I,D) 0.83(F)	0.15(F) 0.70(I) 0.77(I,D) 0.86(F)	+	-	+	S-38
Solanaceae								
<i>Lycium arabicum</i>	hb.	0.32(I,D) 0.42(F) 0.52(F) 0.82(I,D) 0.89(F,I,D)	0.15(I,D) 0.24(I,D) 0.36(F,I,D) 0.83(I,D) 0.87(F,D) 0.91(I,D)	0.63(F) 0.73(I,D) 0.78(F,I,D) 0.84(I,D)	+	-	+	S-10

Adsorbent: Silicagel G. Developers: BHH, BuOH-H₂O-AcOH(5:4:1); AB, 0.1% Ammonia-BuOH(1:1); BH, BuOH-2% HCl (96:20) Detection: D, Dragendorff's reagent; I, Iodine; F, Fluorescence

acid solution)

Detection of spots on TLC plates

The TLC plates were prepared with silica gel (Kieselgel G Nach Stahl) with 0.25mm thickness and activated at 105°C for 30 minutes. Three different developing solvent systems were adapted.

- 1) BHH system; BuOH:H₂O:AcOH=5:4:1
- 2) AB system; 0.1% Ammonia—BuOH=1:1
- 3) BH system; BuOH:2% HCl=96:20

Three different detecting methods were applied.

1) spray the TLC plate with Dragendorff's reagent

2) develop the spots with iodine

3) develop the spots with fluorescence

The R_f values were calculated following the usual method. (Received Aug. 15, 1977)

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