Table 7 Solvent Systems for the Separation of Hydroxyanthraquinones by TLC

Hydroxyanthra-quinone metabolite	Solvent system[a]	Detection
Aurantioskyrin	B:A (4:1)	Magnesium acetate
Auroskyrin	B:A (20:1)	Magnesium acetate (yellow)
Catenarin	B:A (20:1), B:A (4:1)	Magnesium acetate
Chrysophanol	B:H (1:1), B:A (4:1), A:H:W (5:5:3.5)	Magnesium acetate (yellow)
Deoxyluteoskyrin	B:A (4:1)	Magnesium acetate (yellow)
Deoxyrubroskyrin	B:A (4:1)	
Dianhydrorugulosin	B:H (1:1)	Magnesium acetate (yellow)
Dicatenarin	B:A (4:1)	Magnesium acetate
Emodin	B:A (20:1), B:A (4:1), A:H:W (5:5:3.5)	Magnesium acetate (yellow)
Iridoskyrin	B:H (1:1), A:H:W (5:5:3.5)	Magnesium acetate
Islandicin	B:H (1:1), B:A (4:1), A:H:W (5:5:3.5)	Magnesium acetate
Luteoskyrin	B:A (4:1), A:H:W (5:5:3.5)	Magnesium acetate (yellow)
Punikoskyrin	B:A (20:1)	Magnesium acetate
Rhodoislandin A	B:A (20:1)	Magnesium acetate
Rhodoislandin B	B:A (20:1)	Magnesium acetate
Roseoskyrin	B:H (1:1)	Magnesium acetate
Rubroskyrin	B:A (4:1), A:H:W (5:5:3.5)	Magnesium acetate
Skyrin	A:H:W (5:5:3.5), B:A (20:1)	Magnesium acetate
4α-Oxyluteoskyriin	B:A (4:1)	Magnesium acetate

[a]A = acetone, B = benzene, H = hexane, T = toluene, W = water.
Source: Ref. 3.

10. *epi*-Polythiopiperazine-3,6-Diones

epi-Polythiopiperazine-3,6-diones are secondary metabolites of mycotoxins such as sporidesmins that cause facial eczema in some grazing animals (3) and some antibiotics such as gliotoxins produced by some fungi. Gliotoxins are produced by *Aspergillus fumigatus* (78) and are separated on silica gel 60 plates by using a methylene chloride–methanol (97:3) solvent system. They are detected by spraying the plates with 5% silver nitrate in 90% ethanol (79). Silica gel F_{254} plates are used to analyze sporidesmins H and J by developing in benzene–ethyl acetate (4:1) (80), and either 5% silver nitrate or chromic acid is sprayed to detect them (79).

11. Tremorgenic Mycotoxins

Tremorgenic mycotoxins have a common indole moiety in their structures. Silica gels and modified silica gels are commonly used to analyze these toxins by TLC using a variety of solvent systems (Table 8).

12. *Alternaria* Toxins

Mycotoxins known as *Alternaria* toxins have been extracted from rice, maize, tomatoes, and barley contaminated with the fungus *Alternaria alternata* (90). They include altenuene, alternariol, alternariol methyl ether, and altertoxin I and II. Keisel-gel 60 F_{254} plates are used for the separation of these toxins using toluene–ethyl acetate–formic acid (6:3:1) and chloroform–ethanol–ethyl acetate (90:5:5) as solvent systems. The separated toxins are detected by quenching of fluorescence under UV light or by spraying with 20% ethanolic aluminum chloride. Altertoxins produce a characteristic yellow fluorescence, whereas alternariol, alternariol methyl ether, and altenuene produce violet-blue fluorescence (91).

13. Citrinin

Thin-layer chromatography can be used for qualitative and quantitative analysis of citrinin in various food commodities. Although silica gel and Silufol plates are most commonly used as the