(amydalase and linamarase) extracted from the yeast *Endomyces fibuliger* has been studied using TLC. Analyses of this toxin are performed on silica gel 60 F_{254} sheets (64271: Merck, Darmstadt, Germany), and the plates are developed in ethyl acetate–acetone–chloroform–methanol (5:3.75: 1.5:1.25) (113). Visualization of the reaction products of the spots is done using a 1% aqueous solution of β-glycosidase as the source of enzyme.

3. Glycoalkaloids

a. Solanine and Chaconine. The toxic steroidal glycoalkaloids such as α-solanine and α-chaconine are naturally occurring compounds found in plants of the Solanaceae family including potatoes, tomatoes, and sweet pepper. The concentration of these compounds is increased by mechanical injuries as well as by fungal or viral attacks. Some cultivars may contain high amounts of these glycoalkaloids. High-performance thin-layer chromatography is used to determine the two main toxic glycoalkaloids, solanine and chaconine, in potatoes (114). Silica gel 60 HPTLC plates are also used as the adsorbent. The plates are developed in chloroform–methanol–aqueous ammonium hydroxide (70:30:5). Separated toxins are detected using six different detection reagents—molybdatophosphoric acid, paraformaldehyde reagent, Ce(IV) sulfate reagent, Dragendorff's reagent, and concentrated sulfuric acid in ethanol—and the detected spots are quantified by densitometry. The fluorescence enables the detection of 10 ng of each glycoalkaloid.

b. Other Solanine Derivatives. Thin-layer chromatography is used for the detection of spirosolane, solanidane, solasodine, dehydrotomatine, α-tomatine, α-solanine, α-chaconine, dehydrotomatidine, and tomatodine, which are also glycoalkaloid toxins produced by potatoes and tomatoes (115). Normal-phase TLC on precoated silica gel 60 F_{254} sheets is used for the analysis, and the plates are developed in a chamber saturated with 95% ethanol or methanol–chloroform (2:1). The toxins are detected after spraying with aqueous cobalt(II) thiocyanate solution or with methanolic (95%) sulfuric acid (1:1) followed by heating. However, cobalt solution does not produce any color differences among the spots of different alkaloids, and the color of the spots usually disappears in 10 min.

4. Sweet Potato Toxins

Toxic metabolites are produced by sweet potatoes (*Ipomea batatas*) as a result of stress in response to damage by insects, mold growth, mechanical injury, or some chemicals (116). Ipomeamarone and ipomeanine are hepatotoxic, whereas 4-ipomeanol, 1-ipomeanol, ipomeanine, and 1,4-ipomeadol cause damage to the lungs (117). After the extraction of these toxins from sweet potatoes with ether, they are partially purified on a silica column and eluted with various amounts of ethyl acetate and hexane. TLC is done for these toxins on silica gel plates using benzene–methanol (9:1) as the solvent system (118). The separated toxins are detected after the plates are sprayed with Ehrlich's reagent followed by gentle heating to develop the spots. Ipomeamarone and 1,4-ipomeadiol are seen as pink-orange spots, whereas 1-ipomeanol and 4-ipomeanol are visualized as purple spots with different R_f values. Ipomeanine is seen as a light gray spot.

5. Gossypol

Gossypol is a highly toxic polyphenolic binaphthylaldehyde found in cottonseed. Although ruminants can tolerate this toxin better than nonruminants, it can be toxic to many other animals, insects, and microorganisms (117). TLC is done on silica gel plates with benzene–dioxane–acetic acid (91:10:4) as the solvent system. Gossypol content is determined by the measurement of absorbance at 483 nm after reaction with aniline, and the toxin is seen as a blue fluorescent spot (R_f = 0.87) (118). Silica gel plates are also developed in hexane–ethyl acetate–acetic acid (199:199:2), and dianilinogossypol is visualized as a yellow spot (R_f = 0.68) (120).

6. Pyrrolizidine Alkaloids

Pyrrolizidine alkaloids are found in over 200 plants around the world, and over 150 different ones have been reported. Some of these are plant species in the genera *Crotalaria, Senecio, Heliotropium, Trichodesmo, Echium*, and *Amsinckia* (117). The toxicity of the individual alkaloids varies widely, and some of these toxins can enter the human body through foods such as grains, milk,