perform pre- or postchromatographic derivatization to produce colored or fluorescent compounds. They are then visualized on TLC plates using ninhydrin, *p*-anisaldehyde, *o*-phthalaldehyde, and fluorescamine (105). Fumonisins B_1, B_2, and B_3 are easily detected at microgram levels by TLC plates coated with either normal-phase silica gel or reversed-phased C-18 adsorbent (chemically modified silica gel) (106). TLC combined with overpressured layer chromatography (OPLC) is also used to separate all fumonisins of the B series (107).

21. Ergovaline

Ergovaline is a mycotoxin produced by *Neotyphodium coenophialum* growing in the seeds of members of Graminaceae family. Fescue cytoxicosis and rye grass staggers in animals are caused by the poisoning of these animals with *Neotyphoidium*-infested forage. HPTLC is used as a rapid technique to detect these toxins in the seeds of endophyte-infested perennial rye grass and tall fescue (108). Toxin samples and standard ergovaline solutions are sprayed automatically with high purity pressurized nitrogen gas on a glass HPTLC plate, coated with silica gel 60 with a film thickness of 0.25 mm. The plates are developed in chloroform and ethanol (17.5:2.5) for 20 min. After drying, the plates are read using fluorimetry with an excitation wavelength of 318 nm and an emission wavelength of 400 nm. Ergonovine, ergotamine, ergocryptine, ergocristine, and ergocornine are well separated and detected with detection limits of 0.5 μg/g.

B. Cyanobacterial Toxins

Freshwater and marine cyanobacteria species are known to produce a wide array of toxins and their metabolites. Two-dimensional (2-D) TLC is used for the chemical and ecological evaluation of cyanobacterial crude extracts from the filamentous cyanobacteria *Lyngbya majuscula, S. calcicola*, and *Microcoleus* species (109). Antillatoxin, aplysiatoxin, debromoaplysiatoxin, barbamide, curacin A, carbamin A and B, grandadiene, grandamide, kalkipyrone, and lyngbyatoxin are some of the toxic metabolites produced by *Lyngbya*. Majusculamide A and B; malyngamide A, B, H, I, J, K, and L; malyngolide; microcolin A and B; and yapaoamide are produced by *L. majuscula*. Toxic metabolites of *Hormothamnion enteromorphoides*, *Symploca hydnoides*, *Synechocystis* species, and mixed marine cyanobacterial assemblages include nakienone A, B, and C; nakitriol; hormothamnin A; dolastatin 10 and 12; symplostatin 1; lyngbystatin 1; and majusculamide. The structures of these compounds are given in Ref. 109. Silica gel 60 TLC sheets with UV_{254} fluorescent indicator are used for the detection of most of these toxic metabolites. Nonpigmented UV_{254}-fluorescing compounds can be seen directly. The sheets are sprayed with a light, even coating of sulfuric acid in ethanol (1:19) and gently heated with either a high temperature air gun or a hot plate to detect nonfluorescing compounds by acid charring.

C. Plant Toxins

1. Linamarin

Linamarin is a toxic natural cyanogenic glucoside in the tubers and leaves of cassava (*Manihot esculenta* Crantz), which is the major staple food in sub-Saharan Africa. Cassava leaves are also used as a major vegetable in other parts of Africa and some parts of Asia. The tubers and leaves contain the cyanogenic glucosides linamarin and lotaustralin, and various analytical techniques are used to determine these toxins in the tubers.

A simple, rapid, and accurate high-performance thin-layer chromatographic method is used for direct quantitative analysis of linamarin in cassava (110). Silica gel 60 F_{254} HPTLC plates are used as the adsorbent. They are developed in ethyl acetate–acetone–water (40:50:10) and ethyl acetate–formic acid–water (60:10:10), and the toxin spots are visualized by dipping the plates into a chamber containing aniline (2%) and orthophosphoric acid (15%) in acetone. Scanning densitometry is used for quantification.

2. Amygdalin

Amygdalin is a toxin present in the seeds of bitter apricot (*Prunus armeniaca*) and other *Prunus* species (111,112). The mechanism of the enzymatic degradation of these toxins by β-glycosidase