methanol–acetic acid (24:2:1), chloroform–acetic acid–diethyl ether (17:1:3), or chloroform–methanol (4:1) (27) for the separation of citreoviridin toxins.

6. Macrocyclic Lactones

a. Zearalenone. Zearalenone and its related mycotoxins are produced by *Fusarium* species. They are often found together with trichothecenes and have been extracted from foodstuffs such as barley, oats, wheat, sorghum, and corn colonized by the fungus. Silica gel is the adsorbent most commonly used for TLC to separate these toxins. Zearalenone toxins spotted on silica gel TLC plates are separated by various solvent systems, including toluene–ethanol (1:1), toluene–chloroform–acetone (3:15:2) (59), toluene–ethyl acetate–chloroform (2:1:1), diethyl ether–cyclohexane (3:1) (60), chloroform–methanol (97:3), ethyl acetate–hexane (1:1), and benzene–chloroform–acetone (45:45:15) (26). Zearalenone toxins on silica gel G are eluted with benzene–methanol–acetic acid (24:2:1), benzene–ethanol (95:5), or chloroform–acetone (9:1) (27). These toxins can be visualized as pink spots after the plates are sprayed with 0.7% aqueous Fast Violet B salt solution followed by spraying with a buffer solution (pH 9) and drying (61). Charred spots are seen when the plates are sprayed with concentrated sulfuric acid followed by heating for 10 min at 100°C. When the plates are sprayed with 50% methanolic sulfuric acid followed by heating for 15 min at 120°C, the separated zearalenone toxins can be visualized initially as yellow spots, which then turn to brown (62).

b. Cytochalasans. Cytochalasans are the secondary metabolites of many varieties of fungi. Methods for the isolation, separation, purification, and detection of these toxins have been reviewed (63). Cytochalasins, zygosporin, aspochalasins, deoxaphomin, proxyphomins, and protophomin are the common cytochalasans.

Cytochalasins. Silica gel is commonly used for the separation of cytochalasins by TLC. Solvent systems such as chloroform–methanol–formic acid (95:5:5), chloroform–diethylamine (90:10), chloroform–methanol (95:5), diisopropyl ether–ethyl acetate (90:10), cyclohexane–ethyl acetate–diethylamine (60:30:10), benzene–methanol (70:30), and *n*-butanol–formic acid–water (80:10:10) can be successfully used for the separation of cytochalasins on silica gel plates (64). Different R_f values are obtained by these solvent systems. Cytochalasins C and D are not well separated when chloroform–methanol (95:5), chloroform–diethylamine (90:10), or cyclohexane–ethyl acetate–diethylamine (60:30:10) is used as the solvent system to separate them on silica gel G TLC plates. However, they can be visualized by their different colors as they fluoresce under UV light after spraying with sulfuric acid followed by heating. Spots of cytochalsin C can be seen as dull orange, whereas cytochalasin D can be seen as yellow (64). Cytochalasins A, B, and C are separated on precoated sulfo-sheets in addition to silica gel plates using various solvent systems (27), whereas cytochalasins H and J are separated on silica gel containing 15% gypsum (65).

Zygosporin. Zygosporin toxins have been extracted from *Zygosporium masonii*, and TLC can be used for their separation on silica gel using chloroform–methanol (9:1) as the solvent system (3).

Aspochalasins. Four isomers of aspochalasins (A, B, C, and D) have been isolated from *Aspergillus parasiticus*. These toxins are separated using chloroform–methyl acetate (4:1) on Kiesel-gel 60 (66). They are detected by heating after spraying with 50% sulfuric acid. Toluene–ethyl acetate–formic acid (5:4:1) is used as the solvent system to separate chaetoglobosins K and L on silica gels.

Deoxaphomin, proxyphomins, and protophomin are separated on preparative TLC plates using chloroform–acetone (3:1) (67). Silica gel F_{254} is used to separate chaetoglobosins A, B, C, D, and E using benzene–ethyl acetate (1:1) and benzene–chloroform–methanol (10:10:3) as solvent systems. Separated toxins are detected under UV irradiation after spraying with Ehrlich's reagent followed by heating (68).

7. Ochratoxin

Ochratoxins A, B, and C are toxic products of seven molds of the genus *Penicillium* and six molds of the genus *Aspergillus* growing on various kinds of cereals. These ochratoxins can persist