

# 1 Alkaloid Drugs

Most plant alkaloids are derivatives of tertiary amines, while others contain primary, secondary or quaternary nitrogen. The basicity of individual alkaloids varies considerably, depending on which of the four types is represented. The  $pK_b$  values (dissociation constants) lie in the range of 10–12 for very weak bases (e.g. purines), of 7–10 for weak bases (e.g. Cinchona alkaloids) and of 3–7 for medium-strength bases (e.g. Opium alkaloids).

## 1.1 Preparation of Extracts

### Alkaloid drugs with medium to high alkaloid contents ( $\geq 1\%$ )

Powdered drug (1g) is mixed thoroughly with 1ml 10% ammonia solution or 10%  $\text{Na}_2\text{CO}_3$  solution and then extracted for 10 min with 5 ml methanol under reflux. The filtrate is then concentrated according to the total alkaloids of the specific drug, so that 100  $\mu\text{l}$  contains 50–100  $\mu\text{g}$  total alkaloids (see drug list, section 1.4).

General method,  
extraction  
method A

**Harmalae semen:** Powdered drug (1g) is extracted with 10ml methanol for 30 min under reflux. The filtrate is diluted 1:10 with methanol and 20  $\mu\text{l}$  is used for TLC.

Exception

**Strychni semen:** Powdered seeds (1g) are defatted with 20 ml n-hexane for 30 min under reflux. The defatted seeds are then extracted with 10ml methanol for 10 min under reflux. A total of 30  $\mu\text{l}$  of the filtrate is used for TLC.

**Colchici semen:** Powdered seeds (1g) are defatted with 20 ml n-hexane for 30 min under reflux. The defatted seeds are then extracted for 15 min with 10 ml chloroform. After this, 0.4ml 10%  $\text{NH}_3$  is added to the mixture, shaken vigorously and allowed to stand for about 30 min before filtration. The filtrate is evaporated to dryness and the residue solved in 1 ml ethanol; 20  $\mu\text{l}$  is used for TLC investigation.

### Alkaloid drugs with low total alkaloids ( $< 1\%$ )

Powdered drug (2g) is ground in a mortar for about 1 min with 2ml 10% ammonia solution and then thoroughly mixed with 7g basic aluminium oxide (activity grade I). This mixture is then packed loosely into a glass column (diameter, 1.5 cm; length, 20 cm) and 10ml  $\text{CHCl}_3$  is added. Alkaloid bases are eluted with about 5ml  $\text{CHCl}_3$  and the eluate is collected, evaporated to 1 ml and used for TLC.

Enrichment  
method, extraction  
method B

This method is suitable for the Solanaceae drugs, e.g. *Belladonnae* or *Scopoliae radix* and *Stramonii semen*, which should be defatted first by extraction with n-hexane or light petroleum. Leaf extracts contain chlorophylls, which can interfere with the TLC separation. In such cases extraction with sulphuric acid (described below) is recommended.