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A new source of anabesine

While investigating the chemical constituents of *Haloxylon Persicum* Boiss. (Fam. Chenopodiaceae) which grows wild in the Kingdom of Saudi Arabia we have found that anabesine is the major alkaloidal principle of this plant which causes death among grazing animals. The predominance of anabesine is in contrast to *H. salicornicum* Boiss which contains anabesine as a minor alkaloid along with many other chemically different alkaloids (Michel, Sandberg & others, 1967).

Nicotine was also identified as a minor alkaloidal component and two other alkaloids were detected in trace amounts. The powdered dried plant (1 kg) was defatted with light petroleum (b.p. 60-80°) and the defatted material exhaustively extracted with ethanol (96%). The ethanolic extract was concentrated, acidified, filtered and extracted with chloroform.

The aqueous layer was basified with ammonia and the liberated alkaloids were extracted with chloroform (yield about 57 g). Fractional distillation of the total alkaloids gave a major fraction boiling at 279-280° which was identified as anabesine (yield about 43 g) by its physical constants b.p. (279-280°); mol. wt. (162.06— by non-aqueous titration). Its infrared spectrum, R_F values on t.l.c. (Table 1) were

Table 1. R_F values of anabesine, and nicotine on t.l.c.*

Solvent system	Anabesine		Nicotine	
	Reference	Isolated	Reference	Isolated
CHCl ₃ -MeOH (80:20)	0.23	0.22	0.55	0.53
CHCl ₃ -MeOH (33:66)	0.21	0.23	0.46	0.45
CHCl ₃ -MeOH-NH ₄ OH (60:10:1)	0.56	0.57	0.75	0.77
CHCl ₃ -Me OH-Ac OH (60:10:1)	0.06	0.07	0.08	0.09

* Silica gel G after Stahl (1969).

identical with that of reference anabasine. The m.p. (204–206°) and the mol. wt (620.06—by non-aqueous titration) of the dipicrate furnished a further evidence of the alkaloid identity. The presence of nicotine in the plant was confirmed by its identical R_F values on t.l.c. (Table 1) with that of reference nicotine.

Literature review has indicated that this is the first report on the occurrence of nicotine in the genus *Haloxylon* and most likely within the *Chenopodiaceae*.

The percentage of total alkaloids in the powdered dried plant was determined by non-aqueous titration (B.P. 1973) and found to be 5.4% (calculated as anabasine).

The alkaloidal content of this plant which is mostly anabasine (as shown by fractional distillation) is therefore very much higher than those reported for the other plants used as commercial sources of anabasine such as *Anabasis aphylla* L. which contains 0.62–1.3% anabasine, used in the U.S.A. (Smith, 1935; Webb, 1948). Moreover, the plant is widely distributed throughout the Kingdom of Saudi Arabia. It is a large shrub that attains a height of 2 m and is of very low moisture content. All the alkaloidal bases of the plant were obtained by steam distillation and these are most probably of the same chemical class.

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Anomalous behaviour of some hydroflumethiazide crystal samples

During an investigation of the dissolution properties of thiazide diuretics anomalous dissolution properties of four samples of hydroflumethiazide were observed. The samples were prepared as follows:

- (i) hydroflumethiazide was dissolved in heated acetone, the solvent was allowed to slowly evaporate at room temperature (20°) and the material was then dried at 37°;
- (ii) excess hydroflumethiazide was dissolved in boiling absolute ethanol, filtered, allowed to crystallize at 45° and the crystals produced harvested and dried at 45°;
- (iii) hydroflumethiazide was dissolved in absolute ethanol, filtered, rapidly cooled to 2–3°, the needle crystals thus produced were harvested and dried at 100°;
- (iv) hydroflumethiazide was dissolved in absolute ethanol, filtered, rapidly cooled to 2–3° and the needle crystals thus obtained were dried at room temperature under a vacuum of 1 mm Hg for 24 h, and stored in a dessicator containing silica gel.