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CHENOPODIACEAE

ISOLATION OF METHYL CARBAMATE FROM FOUR EGYPTIAN *SALSOLA* SPECIES

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INTRODUCTION

THE GENUS *Salsola* (Chenopodiaceae) has received, chemically, little attention. Some of the European *Salsola* species were examined for their alkaloid content[1-4] and *N*-feruloylputrescine was isolated from *Salsola subaphylla*.[5] In Egypt, twelve species of *Salsola* grow in the desert, and the four now investigated, viz. *S tetrandra*, *S. kali*, *S longifolia* and *S rigida* represent the most common species [6] The presence of a volatile nitrogenous substance was revealed during the preliminary phytochemical screening of these plants The present paper reports the isolation and identification of this volatile base

RESULTS

Paper chromatography in *n*-BuOH–HOAc–H_2O (5:1 4) of the $(CH_2Cl)_2$ extract of the four plants revealed the presence of only one spot (R_f 0 52) The crystalline substance obtained from these extracts melts at 54 57°; its hydrochloride melts at 142°. Its structure as methyl carbamate, NH_2–CO_2Me, is proposed on the basis of the following evidence mol. wt. determined by Knaurs Vapour Pressure Osmometer 79 3; The elementary analysis. found: C, 32 56, H, 7·02, N, 19 01, calc for $C_2H_5NO_2$ (mol wt. 75): C, 32 00; H, 6·60; N, 18 60 The UV max at 215 2 nm in ether. The IR spectrum (in KBr) shows a broad band at 3200–3400 cm^{-1} which indicates the presence of NH_2, a band at 1680 cm^{-1} characteristic of HCOO— and a peak at 1115 cm^{-1} for —$COOCH_3$.[7] The NMR spectrum shows a sharp signal at 8 τ (3 protons) indicating the presence of methyl formate group Two protons appear at a broad absorption centered at 3·8 τ suggesting an aliphatic NH_2 group. Moreover, its physical and chromatographic properties were identical to authentic methyl carbamate.[8]

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EXPERIMENTAL

Isolation of the volatile substance Twelve kg of the defatted powdered herb of *S tetrandra* were moistened with 25% NH_4OH and packed in a glass percolator with $(CH_2Cl)_2$ The powder was allowed to extract for 24 hr, then the solvent was allowed to percolate, till a few milliliters gave negative alkaloidal test The extract was evaporated under reduced pressure below 45° The concentrated extract was left in a refrigerator for a few days when long needles separated These crystals were washed several times with petroleum and recrystallized several times from $(CH_2Cl)_2$ (yield about 0 05%) This was identified as methyl carbamate as described above

Detection of methyl carbamate in the other Salsola *species* Each sample (100 g) was subjected to alkaline steam distillation using 10% NaOH The steam distillate was received in dilute HCl, evaporated under vacuum and the concentrate in each case was applied to Whatman No 1 paper along with authentic methyl carbamate using BAW (50 1 49 and 5 1 4), detection with *p*-dimethylaminobenzaldehyde and ninhydrin Each of the investigated *Salsola* species gave the same spot having the same R_f and colour

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Key Word Index—Salsola, Chenopodiaceae, methyl carbamate

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COMPOSITAE

ALKANES OF THREE *ARTEMISIA* SPECIES

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IT HAS been suggested by Eglinton[1] that the hydrocarbon waxes may be of some use in the chemotaxonomy of closely related genera Little work has been done on members of the Compositae and virtually no chemotaxonomic correlations have been made [2] In our investigations of the chemical constituents of *Artemisia* we have isolated and examined the total alkanes from aerial parts of three local *Artemisia* species, *A ludoviciana* Nutt Var *gnaphaloides* Nutt , *A cana* Pursh and *A frigida* Wild. All of these plants were collected while in full bloom so that variation due to the extent of development should play little role in alkane comparisons. *A ludoviciana* and *A frigida* are fairly widespread in the Canadian prairies whereas *A cana* is relatively restricted to a few dry saline areas

In all three species the odd numbered straight chain hydrocarbons form by far the

* Abstracted in part from the thesis of A B Paralikar submitted to the University of Calgary for the Ph D degree (1970)

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