in 10 ml of dilute nitric acid, the solution is transfered to a 250 ml volumetric flask with 10 ml of acetic acid. Lead acetate is added to precipitate the phosphate and the pH is adjusted to 2·5–3 and the determination of magnesium is completed by the above procedure. This method can also be used as an indirect method of estimating total phosphate content in any solution.

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CHEMOTYPIC STUDIES IN NATURAL POPULATIONS OF *RAUVOLFIA SERPENTINA* FROM CERTAIN REGIONS OF KARNATAKA STATE, INDIA

Rauvolfia serpentina (L.), Benth. Ex-Kurtz, belonging to family *Apocyanaceae*, is recognised as an important source of reserpine contained in its roots. Reserpine is considered to be effective in treatment of hypertension all over the world. The plant is indigenous to India, growing wild in the lower hills and in the plains throughout the country. In view of its wide habitat it is natural to expect existence of its geographical races expressing variation in morphology and alkaloid content. With this objective in view, certain regions of South Kanara in the South-west of Karnataka and along its coastal area were surveyed in September–October, 1977, for collection of *R. serpentina* from its natural populations abounding in this area (Kazim)[4]. The regions falling between 12° and 16° N comprised Mangalore, Coondapur and Haliyal. The actual places of collection in each district/taluqua averaged about 10 and the number of plants collected from each place ranged from 15–20. During collection, whole plants were uprooted and their vegetative portion was cut off retaining only about 10 cm of the stem. Such cut plants were then planted in pots at Delhi and nursed. When 1½ years old (in February, 1979), these plants were taken out from the pots; roots were cut and bulked locality-wise. Thus, there were as many samples as the sites of collection in each district/taluqua. These bulked samples were used for the estimation of total alkaloid content. Other material included in the study consisted of 15 collections from Haldwani (U.P.), 17 seedlings from a grafted plant (with *R. tetraphylla* as rootstock and *R. serpentina* as scion) and a control (I.W. 1188–16) released earlier by Mital *et al.*[5]. In these studies, age of all the plants was the same (*i.e.*, 1½ year old) as in Karnataka collections excepting graft seedlings which were 3 years old. In the case of control, the population was small, and hence, only one bulk sample could be taken for analysis.

The bulk samples were analysed for total alkaloid content (*Indian Pharmacopoea*[1]), and their range, mean etc., were obtained as given in Table I.

TABLE I

Range of alkaloid content, mean, C.V. and S.D. in R. serpentina *collections*

Plant material	Range (alkaloid %)	Mean (alkaloid %)	C.V.	S.D.
Seedlings from graft	0·976–1·874	1·416	21·8	·310
Haldwani stock	1·266–1·874	1·516	25·9	·394
Haliyal material	1·402–1·922	1·621	13·6	·220
Mangalore material	1·295–1·735	1·516	9·4	·142
Coondapur material	1·526–2·034	1·806	9·9	·175
Control (IW 1188–16)	..	1·067	..	..

The data were further subjected to T-test as shown in Table II. (excluding the control since it consisted of only one sample).

From Tables I and II it would be seen that range of variation in alkaloid content was maximum in Coondapur collections from 1·526% to 2·034% and was lowest in graft seedlings which were older in age. Age, however, could not be a handicap since Dutta *et al.*[3] did not observe significant differences in alkaloid content in roots of varying ages indicating that higher age does not result appreciably, either in increase or decrease in its total alkaloid. Alkaloid content in Coondapur material was significantly higher at 1% level than the Mangalore stocks while, at 5% level, than the graft seedlings. Within Coondapur itself (Table III) there were location-wise variations in alkaloid content. Plants from two places, *viz.*, Seethanady and Thingale were rich in alkaloid, containing more than 2%, which was nearing that in the control.

TABLE II

T-test significance for different R. serpentina *stocks*

Stocks	Haldwani stock	Haliyal	Mangalore	Coondapur
Graft seedling	0·12	0·87	0·68	2·65*
Haldwani stock	..	0·27	0·00	1·52
Haliyal	..	..	0·81	1·30
Mangalore	..	.	..	3·12**

* Significant at 5%; ** Significant at 1%.

TABLE III

Mean alkaloid content in plants from different localities in Coondapur

Locality	Alkaloid %	Locality	Alkaloid %
Seethanady	2·025	Thingale	2·034
Madamakky	1·889		
Kuntamakky (Site I)	1·661	Mavinguli	1·779
Kuntamakky (Site II)	1·917		

Soil in Coondapur Forest Division is red laterite being rich in humus at places. Temperature in summer goes high (about 40–45° C) and, in winter, drops down to 10–15° C. The area receives high rainfall of about 500 mm annually.

Coondapur region, lying between 13° and 14° N atitude, appeared to be abounding in superior chemotypes which fact is suggestive of carrying out intensive survey work in this area for collection of high alkaloid yielding plants. Such differential potencies in alkaloid content have also been reported by Wakhloo[7] and Santapau[6] indicating regional variation in alkaloid content in *R. serpentina*.

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MICROSOMAL DEGRANULATION BY TEA TANNINS

EPIDEMIOLOGICAL surveys have recently associated a higher incidence of carcinoma with the consumption of tea as a beverage around the world[1–4]. The tannin fractions from tea (*Camellia sinensis*) are very active and produce tumours at the injection sites in 66% or more of the treated animals[5]. In view of the fact that tea tannins have not so far been studied for their