Although several outcrops of metamorphosed basic igneous body in the sub-metamorphic rocks have been reported by earlier workers, the presence of an intrusive carbonatite-alkalic complex is recorded here, for the first time, from the type area of Bijawars. The complex transects the Bundelkhand granites, Bijawars and Vindhyans, and therefore is Post-Vindhyan in age.

B. Das is of opinion that the above geologic succession should be valid for the other parts of the Bijawar belt lying immediately south of the Bundelkhand granites and broadly applicable in the cases of such rocks found elsewhere. This should also be of great value in the identification and correlation of such rocks in the Narmada and the Son valleys. Detail lithologic and structural mapping by the authors have produced results of considerable tectonic significance, which are under analysis.

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CHEMICAL EXAMINATION OF THE STEMS AND LEAVES OF MARSdenia volubils T. COOK

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MARSdenia volubils T. Cook (Syn.: Dregia volubils Benth. ex. Hook. f.) (Fam.: Asclepiadaceae) is a stout tall climbing shrub growing wild in many parts of India. In Ayurvedic medicine the plant has been described as a cure for several diseases. The seeds of this plant have been examined by Reichstein et al., who reported the isolation and chemistry of ester glycosides made up of steroid genins and 2-deoxy sugars. Similar compounds were also reported to be present in Marsdenia tomentosa. In this communication the results of the chemical investigation of the stems and leaves of M. volubils are reported.

The air-dried stems and leaves were powdered and extracted successively with hexane, chloroform and alcohol. The hexane extract on concentration deposited a very small quantity of a red pigment. The residue was chromatographed over alumina. The petroleum-etherbenzene (1:3) eluate yielded a colourless crystalline substance, needles from benzene, m.p. 277-79°, $[\alpha]_D^0 = \pm 2°$. It gave positive Liebermann-Burchard reaction (pink) and analysed $\dagger$ for the formula C$_{30}$H$_{50}$O. It formed a monoacetate, C$_{12}$H$_{22}$O$_2$, m.p. 297-300°, $[\alpha]_D^0 + 12.3°$ and a monobenzoate, C$_{13}$H$_{21}$O$_3$, m.p. 289-92°, $[\alpha]_D^0 + 39.4°$. These properties led to the conclusion that the substance is taraxerol and a mixed m.p. determination of the substance and its benzoate with authentic taraxerol and taraxerol benzoate respectively confirmed the identity.

From the mother liquors of taraxerol another triterpenoid was obtained in small yield, nodules from petroleum ether, m.p. 87-88°, $[\alpha]_D^0 = 8.7°$. It analysed for the formula C$_{30}$H$_{50}$O and formed a monoacetate, C$_{12}$H$_{22}$O$_2$, white crystalline powder from petroleum ether-benzene, m.p. 77-80°.

In the same chromatography petroleum ether-benzene (8:1) eluted a sterol (green colour in Liebermann-Burchard reaction), colourless feathery needles from petroleum ether, m.p. 158-60°, $[\alpha]_D^0 = 37°$. It analysed for the probable formula C$_{30}$H$_{48}$O and formed a monoacetate, C$_{13}$H$_{21}$O$_3$, needles from ethanol, m.p. 137-38°, $[\alpha]_D^0 = 39.2°$ and a monobenzoate, C$_{13}$H$_{21}$O$_3$, prisms from ethanol-benzene, m.p. 149-53°, $[\alpha]_D^0 = 10.1°$.

The chloroform extract residue of the plant material was chromatographed over alumina and all the fractions thus obtained gave positive Keller-Kiliani reaction, indicating the presence of 2-deoxy sugars, and negative Legal and Kedde reactions. Hence these fractions may contain ester glycosides of the type isolated from the seeds by Reichstein et al.$^3$

The alcohol extract was concentrated under reduced pressure and all the alcohol was removed by adding water at intervals. The aqueous liquid thus obtained was extracted successively
with petroleum ether, ether, ethyl acetate and n-butanol. The petroleum ether fraction gave only a waxy residue. The ether extract on concentration deposited a yellow solid which on repeated crystallization from alcohol gave an yellow crystalline substance, m.p. 276–78°. The substance answered the characteristic colour reactions of flavonols and analysed for \( \text{C}_{13}\text{H}_{10}\text{O}_{6} \) (a tetrahydroxy flavone). It formed a tetraacetate \( \text{C}_{27}\text{H}_{18}\text{O}_{19} \) feathery needles from alcohol, m.p. 183–85°. The properties of the flavone and its acetate indicated that it might be identical with kąmpferol. This was confirmed by a direct comparison (mixed m.p. and paper chromatography kindly carried out by Prof. S. Rangaswami) with authentic samples of kąmpferol and its acetate.

The ethyl acetate extract on concentration gave a very small quantity of a pale yellow solid which crystallized from alcohol as pale yellow prisms. Its colour reactions indicated that it was a flavan glycoside. Hydrolysis of the glycoside with alcoholic hydrochloric acid gave an aglycone which was shown to be kąmpferol by paper chromatography. The sugars were identified as glucose and galactose by paper chromatography. Further, colour reactions of the glycoside and the aglycone with neutral lead acetate and zirconiumoxychloride–citric acid showed that the sugar residue is attached to the 3-OH of kąmpferol.

From the butanic extract a powdery solid was obtained whose properties indicated the presence of saponins. It also gave a pink colour with Mg-HCl and an yellow precipitate with neutral lead acetate. Hydrolysis with acid afforded a flavonol, identified as kąmpferol. Attempts to separate the flavonol glycoside from the saponin were not successful.

Our grateful thanks are due to Prof. S. Rangaswami for the comparison of the flavonol.


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**ON ADULTS OF THE SUBULURID INFECTIVE LARVA FROM TENEBRIONID BEETLE WITH REMARKS ON THE VALIDITY OF SUBULURA MINETTI BHALERAO**

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The subulurid infective larva from *Gonoccephalum depressum* F., commonly found in and around the Poultry Units, developed successfully into the preadults of *Subulura minetti* Bhalariao, 1941, described from fowls at Jaipur (Srivastava and Pande, 1967). A number of specimens collected from 258 beetles, during the teaching session 1966-67, yielded fully mature worms in feeding experiments with laboratory raised clean chicks. The adults recovered were studied to determine their correct identity and to examine the validity of *S. minetti*.

The cysts and the excysted juveniles, in matter of size and structure, conformed to the account given by Srivastava and Pande (*loc. cit.*). A dose of 100 cysts or 88 excysted specimens was administered to the experimental chicks. On postmortem, one of the infected chicks yielded, from its caecum, a 7-day old juvenile which (Fig. 1), with nearly rounded anterior pointed posterior ends and 1·920 mm. length and 0·096 mm. width, had the oesophagus with its characteristic posterior bulb of 0·580 mm. length—the bulb being 0·088 X 0·069 mm. in size; the nerve ring and excretory pore at 0·120 mm. and 0·254 mm. distance respectively behind the anterior end, and the anus opening at 0·142 mm. distance in front of the posterior extremity. Evidence of rudiments of external genitalia was, however, lacking.

The droppings of the two chicks became positive for characteristic eggs 60 and 66 days respectively after the infection. On autopsy, 6 males and 13 females were collected—4 males and 11 females from one chick and 2 males and 2 females from the other.