3. F. G. MANN and B. C. SAUNDERS, "Practical Organic Chemistry", Longman, New York, 1936, p. 365.
4. E. L. HIRST and J. K. N. JONES, *J. Chem. Soc.*, 1949, 1959.
5. R. KHUN, H. TRISCHMANN and I. LOW, *Angew. Chem.*, 1955, 67, 32.
6. A. ULUBELEN, M. MISKI, P. NEUMAN and T. J. MABRY, *Lloydia*, 1979, 42, 262.
7. S. F. EL-NAGGAR and R. W. DOSKOTCH, *Lloydia*, 1979, 42, 126.
8. A. ULUBELEN, T. J. MABRY and Y. AYNEHEHI, *Lloydia*, 1979, 42, 624.

Isolation of Hordenine from *Desmodium floribundum* G. Don.

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DESMODIUM (Leguminosae) is a large genus of perennial or annual herbs or shrubs found throughout the tropical and subtropical regions of the world. About thirtyeight species belonging to this genus are known to occur in India[1,2]. The extracts of different parts of the members of this genus are well known for their medicinal uses in the indigenous system of medicine for a variety of ailments[1].

Earlier work on the alkaloids of a number of *Desmodium* species by Ghosal and coworkers[3] shows that this genus elaborates mainly simple indole and β-phenylethylamine alkaloids some of which elicit interesting pharmacodynamic properties. In view of this observation and the absence of any published report on the alkaloids of *Desmodium floribundum*, this plant was collected from Ranikhet (U.P.) area and taken up for investigation of its alkaloids. Separation of alkaloids from the alcoholic extract of the whole plant of *D. floribundum* following usual procedure[4], chromatography of the total alkaloid fraction over silica gel column and elution with ethyl acetate-methanol (97 : 3) mixture furnished a homogenous solid which crystallised from benzene as colourless plates, m p. 173°. The compound responded to Beilstein test for halogens, phosphomolybdic acid test for phenols and analysed for the molecular formula, $C_{10}H_{15}NO.HCl$. Its uv spectrum (λ_{max} 224, 227 nm ; ε 7330, 2200) resembled that of *p*-cresol, ir spectrum showed band for phenolic hydroxyl (3450 cm^{-1}) and ^1H nmr spectrum ($CDCl_3+CD_3OD$) showed signals for four aromatic hydrogens of a 1,4-disubstituted phenyl nucleus (δ 7.11 and 6.78, 2H, d each, *J*8Hz), four aliphatic hydrogens of two vicinal methylenes around δ 3.14 as multiplets and two methyl groups bound to a protonated nitrogen as a six-proton singlet at δ 2.89. Mass spectrum of the compound showed the molecular ion peak at *m/z* 165 (4%) corresponding to the free base, $C_{10}H_{15}NO$, a significant ion peak at *m/z* 107 (9%) due to hydroxytropylium cation and the base peak at *m/z* 58 ($CH_2=N^+Me_2$) characteristic of dimethylaminoethyl side chain[5]. The data indicated the alkaloid to be hordenine hydrochloride (*N,N*-dimethyltyramine hydrochloride) which was confirmed by direct comparison (m.m.p. and tlc) of the derived free base with authentic sample.

The notoriety of chloroform for conversion of alkamines to their hydrochlorides is well known[6,7] and the isolation of hordenine as its hydrochloride is presumably due to the use of this solvent for extraction of alkaloids.

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References

1. R. N. CHOPRA, S. L. NAYAR and I. C. CHOPRA, "Glossary of Indian Medicinal Plants", C.S.I.R., New Delni, 1956, p. 94.
2. "The Wealth of India : Raw Materials", C.S.I.R., New Delhi, 1952, Vol. 3, p. 41.
3. S. GHOSAL and R. S. SRIVASTAVA, *Phytochemistry*, 1973, 12, 193 and references cited therein.
4. M. SAHAI and A. B. RAY, *J. Org. Chem.*, 1980, 45, 3265.
5. K. K. SETH, V. B. PANDEY, A. B. RAY, B. DASGUPTA and A. H. SHAH, *Chem. Ind. (London)*, 1979, 744.
6. T. A. HENRY, "The Plant Alkaloids", J & A Churchill Ltd., London, 1949, p. 636.
7. A. B. RAY, Y. OSHIMA, H. HIKINO and C. KABUTO, *Heterocycl.*, 1982, 19, 1233.

Chemistry of *Salvia lanata* Roxb.

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IN previous communications[1-3], we reported the isolation and characterisation of some di- and triterpenoidal components from the petrol extract of the whole plant (aerial parts and roots) of *Salvia lanata*[4]. This paper reports the isolation and identification of three pentacyclic triterpenes from the chloroform extract of defatted plant materials. Air dried and powdered whole plant (aerial parts