Department of Botany,
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NIRMALA UPADHYAY.

1. Ahmad, K. J., "Cuticular studies with special references to abnormal stomatal cells in *Cestrum*," *J. Indian bot. Soc.*, 1964 *a*, 43, 164.
2. —, "On stomatal abnormalities in Solanaceae," *Sci. & Cult.*, 1964 *b*, 30, 349.
3. Dehnel, G. S., "Abnormal stomatal development in foliage leaves of *Begonia aridicaulis*," *Amer. J. Bot.*, 1961, 48, 129.
4. Metcalfe, C. R. and Chalk, L., *Anatomy of the Dicotyledons*, 1950, 1 & 2, Oxford.
5. Pant, D. D. and Banerji, Rina., "Epidermal structures and development of stomata in some Convolvulaceae," *Senckenberg biol.*, 1965, 46, 156.
6. Ramayya, N., "Studies on the trichomes of some Compositae. I. General structure," *Bull. bot. Surv. India*, 1962, 4, 117.
7. Stace, C. A., "Cuticular studies as an aid to Plant Taxonomy," *Bull. Br. Mus. nat. Hist.*, 1965, 4, 1.
8. Sitholey, R. V. and Pandey, Y. N., "Giant stomata," *Ann. Bot.*, 1971, 35 (14), 641.
9. Solereder, H., *Systematic Anatomy of the Dicotyldons*, Oxford, 1908, 2.

SHORT SCIENTIFIC NOTES

Caffeic Acid from the Leaves of *Spathodea campanulata*

Spathodea campanulata Beauv. (Bignoniaceae) is a tall, splendid, decorative tree with large orange-scarlet bell-shaped flowers[1,2]. The leaves of the plant have been examined for their phenolic components and the isolation of caffeic acid, in addition to quercetin reported earlier[3], is recorded here.

Dry leaves of *S. campanulata* were extracted with hot 80% alcohol under reflux and the aqueous alcoholic concentrate successively shaken with petroleum ether and ether. The petroleum ether fraction did not yield any crystalline solid. The residue from the ether fraction in acetone was adsorbed on a column of silica gel and eluted with ethylacetate. The eluate on concentration and crystallisation from MeOH-EtoAc came out as light yellow needles, m.p. 210–12°, yield, 0·05%, $\lambda_{max.}^{MeOH}$ 214, 235 (sh), 288, 315 nm and IR (KBr) 812, 849, 899, 972, 1118, 1172, 1212, 1448, 1640 and 3440 cm^{-1}. It was soluble in alkalies, MeOH and EtOH, gave a green colour with aq. $FeCl_3$, reduced warm ammoniacal $AgNO_3$ and formed an acetate, m.p. 201–03° (EtOH). From these data it was identified as caffeic acid (characteristic fluorescence under UV) and the identity confirmed by co-PC and m.m.p. with an authentic sample.

We thank Dr. T. R. Govindachari, Director, CIBA Research Centre, Bombay, for the spectral data, Prof. R. H. Thomson, University of Aberdeen, Scotland, for an authentic sample of caffeic acid.

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N. SULOCHANA.
S. NAGARAJAN.

1. Gamble, J. S., *Flora of the Presidency of Madras*, Botanical Survey of India, Calcutta, 1957, 2, 703.
2. Blatter, E. and Millard, W. S., *Some Beautiful Indian Trees*, The Bombay Natural History Society, Bombay, 1954, p. 136.
3. Subramanian, S. S., Nagarajan, S. and Sulochana, N., *Phytochem.*, 1972, 11, 1499.

Partial Synthesis of Protopromulagenin-A

A novel 13β, 28-epoxide bridge has been suggested for a number of triterpenes of the β-amyrin group recently isolated from primulaecous plants[1]. An unambiguous synthesis of one of these compounds was deemed helpful to confirm this structural feature.

Preparation of the corresponding ether from oleanolic acid was taken as a model. Oleanolic acid was converted to the known 13 β, 28-γ-lactone[2] with dry HCl and was then reduced with BF_3-etherate and LAH to give a neutral product, $C_{30}H_{50}O_2$, m.p. 229°, $(\alpha)_D + 2°$. This compound had the expected mol. wt. of M+442, its IR spectrum was transparent in the carbonyl region showing thereby that the lactone is completely reduced, and its NMR spectrum showed the absence of the C_{11}-vinyl proton and the presence of two protons for the C_{13} β–O–$C_{28}H_2$ as doublets centred at δ 3·28 and 3·74 ($J = 7·5$ Hz). This compound must therefore be having a β-oxide bridge between C_{13} and C_{28}. Acetylation of this in the usual way gave a monoacetate, $C_{32}H_{52}O_3$, m.p. 222°, $(\alpha)_D + 0·3°$, and it had the spectral characteristics of the 3 β-acetoxy 13 β, 28-epoxy compound.

Echinocystic acid was converted to the known diacetate bromolactone[3] and was then reduced with

BF_3-etherate and LAH. Chromatography of the product gave a neutral compound $C_{30}H_{50}O_3$. Its R_f value, m.p. and rotation were the same as that of an authentic sample of protopromulagenin-A, kindly supplied by Prof. I. Kitagawa. The IR and NMR spectra of the compound have the same absorptions as the title compound and the compound is thus identified as protopromulagenin-A.

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A. A. NATU.

1. Kitagawa, I., Matsuda, A. and Yosioka, I., *Tetrahedron Letters*, 1968, p. 5377.
2. Barton, D. H. R. and Holness, N. J., *J. Chem. Soc.*, 1952, p. 78.
3. Sannic, Ch., Lapin, H. and Varshney, I. P., *Bull. Soc. Chim. France*, 1957, p. 1440.

Histamine Content of the Digestive Tract in a Taleostean Fish *Heteropneustes fossilis* in Relation to Spawning

It is known that histamine content varies greatly from species to species and that variations in histamine content occur with age, weight and hormonal conditions of the body[1-6]. In the present communication the histamine content of the digestive tract of the taleostean fish *Heteropneustes fossilis* has been correlated with spawning.

The mature female fishes were procured from local fish market and were brought to the laboratory alive. After taking the weight of the body, the ovaries were removed just after decapitation and weighed to calculate the gonosomatic index (G.S.I.) as per method of Lehri[7]. Whole of the digestive tract including stomach was taken out. Stomach, duodenum (portion 2–3 cm next to the stomach) and ileum (distal narrower portion) were dissected out and cut separately. These separated portions of the gut were chopped in cubes of 1×1 mm by Mc Ilwain tissue chopper and extracted with trichloroacetic acid for estimating histamine content as per method of Parratt and West[2]. These investigations were carried out during the months of August and September 1972. The results are summarised in Table I.

It would be observed from Table I that the histamine content was significantly higher in all the three parts of the digestive tract in fishes in which spawning had not taken place (G.S.I. $14{\cdot}135 \pm 0{\cdot}435$ S.E.), while a significantly lower histamine content was observed in fishes after spawning (G.S.I. $5{\cdot}713 \pm 0{\cdot}432$ S.E.). The increased histamine levels before spawning may be related to optimum productions of gonadotrophins at this

TABLE I

Histamine content in three parts of the gut of a taleostean fish, Heteropneustes fossilis *in relations to spawning histamine content in μg/g of wet tissue ± S.E.*

Sex	G.S.I.	Stomach	Duodenum	Ileum
Female (7)	14·135 ±0·435	5·698 ±0·252	3·815 ±0·188	2·272 ±0·134
Female (6)	5·713* ±0·432	2·071* ±0·211	1·873† ±0·226	1·399* ±0·158

Note: Number in parenthesis indicates the number of fishes used.

* $P < 0{\cdot}01$

† Not statistically significant.

stage which in turn is known to inhibit histaminase enzyme[8]. Further, the presence of gonadotrophins have also been proved in *H. fossilis* by Ramaswami and Sundararaj[9].

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1. Feldberg, W., In *Histamine*, Eds., G. E. W. Wolstenholme and C. M. O'conner, Ciba Found. Symp. Churchill, London, 1956, p. 4.
2. Parratt, J. R. and West, G. B., *J. Physiol. (Lond)*, 1957, 137, 169.
3. Arora, S., Lahiri, P. K. and Kumar, V., *Aspec. Allar. Imum.* 1968, 2, 105.
4. Reite, O. B. *Nature (Lond.)*, 1965, 206, 1334.
5. Hogben, C. A. M., *Proc. Soc. Expt. Biol. Med.*, 1967, 124, 390.
6. Reite, O. B., *Experientia*, 1969, 25, 276.
7. Lehri, G. K., *Acta Anat.*, 1968, 69, 105.
8. Kapeller-Adler, R., *In Histamine*, Eds. C. E. W. Wolestenholme and C. M. O'conner, Ciba Found. Symp. Churchill, London, 1956, p. 272.
9. Ramaswami, L. S. and Sundararaj, B. I., *Acta Anat.*, 1958, 32, 230.

Occurrence of Lamprophyre near Murud-Janjira, Kolaba District, Maharashtra

During a study of basalts and associated intrusives in Murud-Janjira area of Kolaba District of Maharashtra the authors noticed two veins of a dark, fine-grained rock, which on examination was found to be a lamprophyre. Though earlier workers have reported the occurrence of lamprophyres in Bombay area[1,2] they are not known to occur in other parts of the Deccan Trap region of Maharashtra. The Deccan Trap in this part is supposed to be composed of basalts only, with doleritic dykes at places,

The lamprophyre occurs in the form of two small veins which are exposed on the wave-cut platform along the west coast at a distance of about a mile NNE of Khora, a port near Murud-Janjira. The flow, in which the veins are intruded, is composed of dark, fine-grained, amygdaloidal basalt. The exposed thickness of the basalt flow above the sea level is about 50 feet. This flow is overlain by another flow of fine-grained compact basalt into which the veins are not found to be intruded. The veins strike N–S, are parallel and are separated by a distance of about 15 feet. They vary in width from one inch to nine inches and their exposed length is about 100 feet. They show thickening and thinning at places and one of them has off-shoots.

The lamprophyre is a hard, compact, and dark rock composed of very fine-grained matrix in which are found embedded big round flakes of biotite. In thin sections the rock shows characteristic panidiomorphic texture. The matrix is composed of very fine granules of augite, slender needles of a reddish brown amphibole kaersutite, and dusty iron ores scattered in smoky brown glass. Well developed crystals of augite, biotite, and kaersutite are present as phenocrysts. The proportion of augite phenocrysts is much more than that of either biotite or kaersutite. The augite shows zoning, with pale bluish green core and colourless or pale brown margin. Biotite, showing pleochroism from pale yellow to deep reddish brown, occurs as rounded flakes, at places showing corroded borders. Kaersutite occurs as prismatic crystals showing pleochroism from greenish yellow to reddish brown. The rock is found to be devoid of felspar and olivine. On the basis of mineralogical composition it is identified as fourchite[3].

In volcanic environment lamprophyres are generally considered as "members of radial or parallel dyke swarms around denuded volcanoes or filling fissures that fed surface flows" (Williams *et al.*, 1965, p. 85). They are also known to occur as minor members of alkaline olivine-basalt association[4]. It would be interesting to investigate whether any of these features suggested by the occurrence of lamprophyres are present in this area.

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Poona, *April* 20, 1973.

1. Sukhewala, R. N. and Poldervaart, A., "Deccan basalts of the Bombay area," *Ind. Bull. Geol. Soc. Amer.*, 1958, 69, 1475.
2. — and Sethna, S. F., "Deccan traps and associated rocks of the Bassein area," *Jour. Geol. Soc. India*, 1962, 3, 125.
3. Williams, H., Turner, F. J. and Gilbert, C. M., *Petrography, An Introduction to the Study of Rocks in Thin Sections*, Vakils, Feffer and Simons Pvt. Ltd., Bombay, 1965.
4. Turner, F. J. and Verhoogen, J., *Igneous and Metamorphic Petrology*, Allied Pacific Pvt. Ltd., Bombay, 1962.

Effect of Day Length on Flowering in Three Winter Varieties of Rice of Orissa

Fourteen days old seedlings of three high-yielding winter varieties of rice were subjected to 8 hr photoperiod, in seedbeds, separately for 1, 2, 3, 4 and 5 weeks. Then the seedlings, after transplantation, were treated with the same photoperiodic treatment till panicle emergence. Short photoperiod given to 14 days old seedlings for 1 and 2 weeks brought about a significant delay in ear emergence from the control plants grown in open fields in natural day length. The magnitude of delay was statistically of the same order in both the treatments. Prolongation of short days by one more week resulted in significant earliness in heading by 14·74 days in the same plants. With an increase in duration of short photoperiod along with the simultaneous advancement in age of seedlings, there was a gradual increase in the degree of earliness. Thus a linear relationship between the dose of short days and the degree of earliness in heading was noticed. A significant delayed heading in BAM 14 (early-winter) under short days for 3 weeks and a marked earlier heading in the rest of the two varieties, BAM 3 (late-winter) and BAM 11 (mid-winter) rice under the same dose of treatment points to the conclusion that for each specific variety of rice there is an optimum age when it should be most responsive to a specific dose of photoperiod. In the present study, the optimum age appears to be about 28 days for BAM 3 and BAM 11, and about 35 days for BAM 14. The treatment prolonged till heading brought about the same degree of earliness as the one given for 5 weeks in the seed beds. With regard to the varietal difference, it is seen that BAM 3 with photoperiodic sensitivity coefficient of 57·30 is the most sensitive one, BAM 11 with 48·22 comes next and BAM 14 with 36·03 is the least sensitive. The degree of sensitivity is correlated with the natural duration of the varieties.

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