

may be large in view of the increased stability produced by the alternative positive and negative charges. The marked acid properties of sulphamide and its ability to form salts of the type $\text{SO}_2(\text{NHAg})_2$ may be in agreement with this structure.

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NEUTRAL COMPONENTS OF *THESPESIA POPULNEA* FLOWERS

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ABSTRACT

The flowers of *Thespesia populnea* have been found to contain nonacosane, lupenone, myricyl alcohol, lupeol, β -sitosterol and β -sitosterol- β -D-glucoside.

THE flowers of *Thespesia populnea* have been investigated a number of times in the past, with reference to the polyphenolic components present¹⁻³. When the material is extracted in succession with petroleum ether (60–80°), acetone and alcohol, the flavonoids as aglycones and glycosides are found largely in the alcoholic extract⁴. The petroleum ether extract has yielded (+) gossypol as the main component⁵. The present note gives particulars of neutral components now isolated.

The flowers of *Thespesia populnea* (3 kg) were exhaustively extracted with petroleum ether (60–80°) and the extract deposited the yellow pigment (+) gossypol, reported earlier by Datta *et al.*⁵. The petroleum ether was completely removed and the residue taken up in ether. It was extracted with sodium hydroxide. Acidification of the alkaline extract gave a little more of (+) gossypol. On evaporation of the remaining ether extract a dark coloured semi-solid was obtained. It was adsorbed on silica gel and chromatographed on a column of the same whereby the following compounds were obtained.

Compound A, eluted with petroleum ether, had m.p. 64–65° (300 mg, from acetone). Its I.R. spectrum showed that it was aliphatic in nature. It did not answer Liebermann-Burchard test and moved to solvent front on TLC in *n*-hexane. Its mass-spectrum showed a very weak parent peak at *m/e* 408 and showed a cluster of peaks 14 units ($-\text{CH}_2$) apart. The largest peak in each cluster represented $\text{C}_n\text{H}_{2n+1}$ fragment which was accompanied by C_nH_{2n} and $\text{C}_n\text{H}_{2n-1}$ peaks. Very

intense peaks were for C-4 and C-5 units and the fragment intensity decreased in a smooth curve up to $(\text{M}^+-\text{C}_2\text{H}_5)$. The (M^+-CH_3) peak was very small. The compound was identified as nonacosane.

Compound B, eluted with petroleum ether-benzene (1 : 1), had m.p. 168–170° (from acetone, 40 mg), $[\alpha]_D - 40^\circ$; ν_{max} 1725 cm^{-1} (C=O) and gave a phenyl hydrazone, m.p. above 300°. Liebermann-Burchard test was positive. The compound was identified as lupenone.

Compound C, eluted with benzene, had m.p. 80° (from acetone, 200 mg), ν_{max} 3500 cm^{-1} (OH) and gave an acetate, m.p. 67–69°. The mass-spectrum of the acetate showed the parent peak at *m/e* 480 and the base peak at 421, confirming the presence of the acetate group (M^+-59). It also showed a cluster of peaks 14 units ($-\text{CH}_2$) apart. Very intense peaks were for C-6, C-7 and C-8 units. The compound was identified as myricyl alcohol.

Compound D, eluted with benzene : chloroform (3 : 1), had m.p. 218° (from methanol, 80 mg), $[\alpha]_D + 20^\circ$; ν_{max} 3500 cm^{-1} (OH). It formed an acetate, m.p. 215°. $[\alpha]_D + 50^\circ$. Liebermann-Burchard test was positive. The compound was identified as lupeol.

Compound E, eluted with benzene : chloroform (1 : 3), had m.p. 136–137° (from methanol, 200 mg), $[\alpha]_D - 40^\circ$, ν_{max} 3500 cm^{-1} (OH) and gave an acetate, m.p. 125–126° (from methanol), $[\alpha]_D - 35^\circ$. Liebermann-Burchard and TNM tests were positive. The compound was identified as β -sitosterol.

Compound F, eluted with chloroform : methanol (95 : 5), did not melt up to 300° and was not

easily soluble in ordinary solvents (50 mg), $[\alpha]_D^{25} - 50^\circ$ (pyridine). Acid hydrolysis gave β -sitosterol and D-glucose. Permethylation of compound F by Hakomori's method and subsequent hydrolysis by Kiliani's reagent (HCl : AcOH : H_2O ; 1 : 3.5 : 5.5) gave β -sitosterol and 2, 3, 4, 6-tetra-O-methyl D-glucose. Enzymatic hydrolysis with emulsin showed β -linkage. The compound was identified as β -sitosterol- β -D-glucoside.

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METABOLISM IN *MYTILOPSIS SALLEI* (RECLUZ) (PELECYPODA): INFLUENCE OF TEMPERATURE

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THE inter-tidal zone experiences to a great degree the vicissitudes of terrestrial climate and at low tide zone the marine animals are subjected to a wide range of temperature fluctuations. Ghiretti¹ observed that the metabolic rate is generally related to temperature in molluscs as in other poikilotherms. The effect of temperature on the respiration of many molluscs has been studied earlier²⁻⁸. However, studies on the effect of temperature on bivalves appear to have received limited attention⁶⁻⁹.

Mytilopsis sallei (Recluz) is a central American species which has migrated to Indian waters in recent years and has shown extensive propagation in local waters¹⁰. The animal has been found to withstand variations in salinities ranging from fresh water to 50‰ as determined earlier¹¹. In the present studies, investigations were undertaken to examine the influence of temperature ranging from 5° C to 40° C on the metabolism of the bivalve *M. sallei*.

MATERIAL AND METHODS

The experimental animals were collected from test panels exposed at the local harbour and were allowed to acclimatise overnight in the laboratory. Healthy animals of various size groups were then selected and taken in respiratory chambers individually¹². The experiments on the respiration of the animals were conducted at various controlled temperatures ranging from 5° C to 40° C at every five degree interval. It was ensured that the seawater temperature in the experimental jars was brought to the required level prior to the beginning of the experiment. The respiratory chambers containing individual animals were then flushed with nitrogen to remove any oxygen. A series of experiments were conducted at each temperature

and the minimal and maximal rates of respiration were determined. This was regarded as the index of active and standard rates of metabolism¹³. Fresh lot of animals previously acclimatised in the laboratory were selected for each temperature.

RESULTS

The metabolic rate was calculated from the following formula¹⁴:

$$Y' = aX^{b'}$$

where Y' = the respiration rate (Y/X)

X = the body weight

a = constant

and b' = the specific exponent of weight ($b-1$).

A calculated regression line of the metabolic rates (both standard and active) in relation to body size has been drawn for each temperature level on a double log scale as shown in Fig. 1. The effect of temperature on animals of 100 mg body weight has been reconstructed from Fig. 1 and drawn on a semilogarithmic scale (Fig. 2). On the basis of standard and active metabolic rates determined earlier, scope of activity at different temperatures examined has also been determined (Fig. 3).

It may be observed from the results (Fig. 1) that the value of b varies with temperature in the mussel *M. sallei*. The slope of regression correspondingly varied with temperature both for active and standard metabolic rate. The standard rate of metabolism appeared to show a general trend, increasing with increase in temperature. The active rate, on the other hand, showed a variable response to temperature and apparently no general pattern could be observed. The active rate was generally higher at 5° C, 15° C and 30° C. The active rate of metabolism, however, decreased beyond 30° C. The scope of activity as shown in Fig. 3 indicates clearly that the maximum activity of these species is recorded at 15° C. Although another peak was

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