SHORT COMMUNICATIONS

THE CRYSTAL STRUCTURE OF PHENACETIN

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PHENACETIN (*p*-acetaminophenetole) is well known for its analgesic and antipyretic effects. We report here the crystal structure of phenacetin which has been taken up as part of our structural studies on para-amino-phenol derivatives[1].

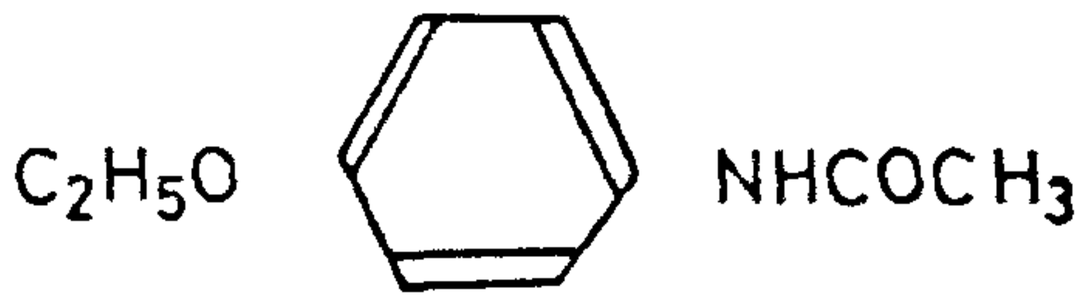


Figure 1. The molecular packing as viewed along *b*-axis.

The compound ($C_{10}H_{13}NO_2$) crystallizes in the space group $P2_1/c$ with $a = 13.25(2)$, $b = 9.65(1)$, $c = 7.82(1)$ Å, $\beta = 104.9°(5)$, $V = 965.03$ Å^3, $d_m = 1.234(5)$, $d_c = 1.233$ g cm^{-3}, $Z = 4$, $\lambda(CuK\alpha) = 1.5418$ Å. The density was measured using benzene and carbon tetrachloride mixture.

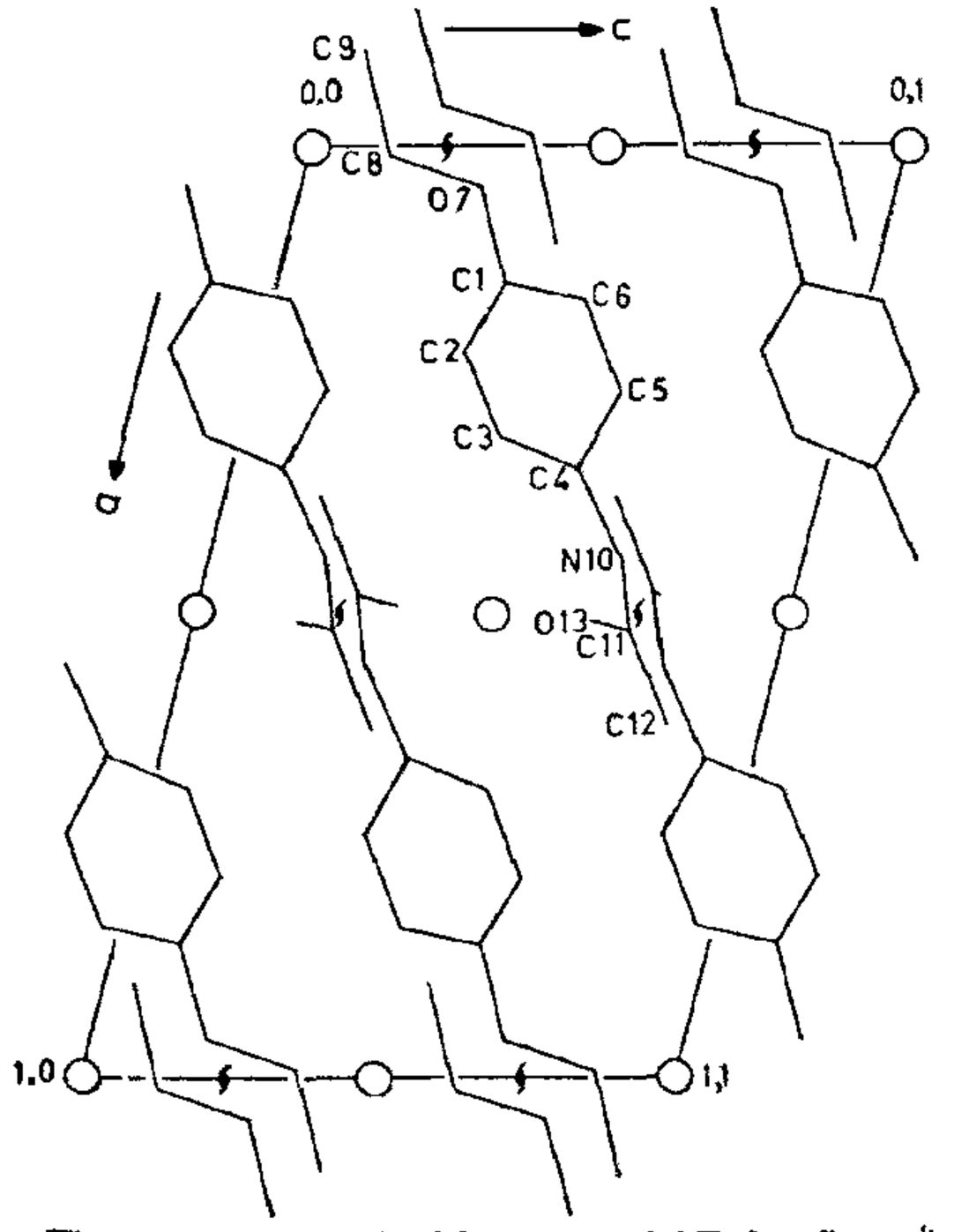
Three-dimensional X-ray intensitiy data were collected photographically by equi-inclination Weissenberg technique. The intensities were estimated visually. The structure was solved by direct methods using program MULTAN-71 and difference Fourier techniques. The current R value after the block-diagonal least squares refinement of positional and isotropic thermal parameters of the non-hydrogen atoms is 0.176. Further refinement is in progress.

The asymmetric unit of the crystal contains one molecule. The bond-lengths and angles at this stage of refinement are listed in table 1. They are broadly similar to those observed in other para-aminophenol derivatives *i.e.* acetamilide[2] and paracetamol[3]. A preliminary examination of the geometry of the structure indicates the benzene ring to be planar and the plane of side chains O7 C8 C9 and N10 C11 C12 O13 are titled by an amount of approximately 8° and 28° respectively with the ring. The crystal structure is stabilized mainly by van der Waals forces. The molecular packing is shown in figure 1.

TABLE 1

Bond lengths (Å) and angles (°)

C1—C2	1.37	C2—C1—C6	120.3
C2—C3	1.38	C2—C1—O7	125.3
C3—C4	1.38	C6—C1—O7	114.5
C4—C5	1.39	C1—C2—C3	119.5
C5—C6	1.35	C2—C3—C4	120.7
C1—C6	1.39	C3—C4—C5	119.1
C1—O7	1.35	C3—C4—N10	123.9
O7—C8	1.44	C5—C4—N10	117.0
C8—C9	1.50	C4—C5—C6	120.7
C4—N10	1.40	C5—C6—C1	119.7
N10—C11	1.34	C1—O7—C8	117.5
C11—C12	1.48	C9—C8—O7	105.9
C11—O13	1.24	C4—N10—C11	126.8
		N10—C11—O13	123.3
		C12—C11—O13	121.9
		C12—C11—N10	114.8



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EXTRACTION OF LECANORIC ACID FROM *PARMELIA ANDINA* MULL. ARG. AND ITS EFFECT ON MITOSIS IN *ALLIUM CEPA* L. ROOT TIPS

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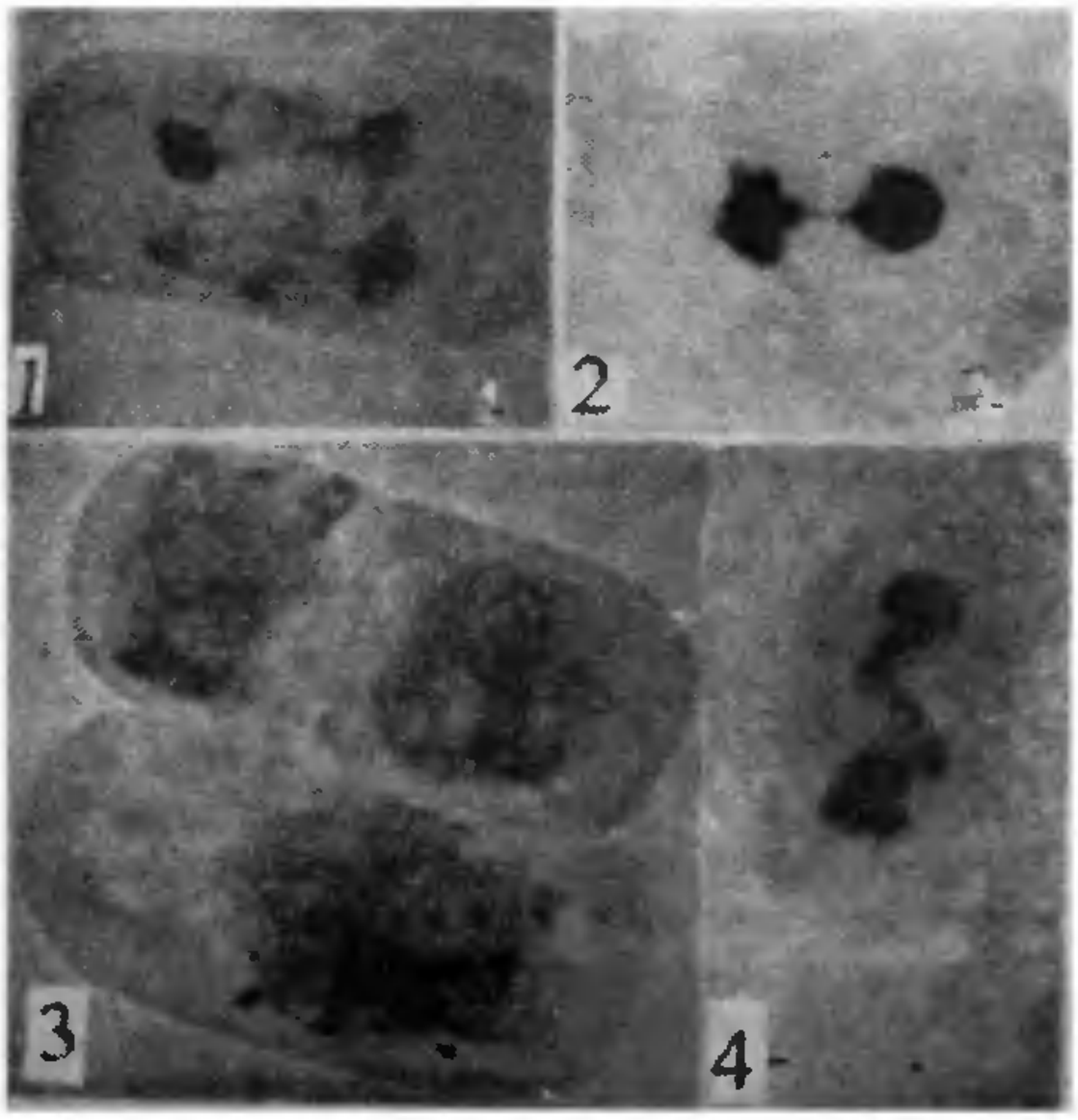
DATA on lichen flora of Andhra Pradesh in particular and South India in general are meagre. Recently *Parmelia andina* was collected[1] on the bark of *Mangifera indica* Linn. from Anantagiri forest, Andhra Pradesh (12° 40′ and 19° 50′ N latitude and 76° 45′ and 84° 40′ E longitude).

Lecanoric acid has been extracted following the method described earlier[2]. The compound was found identical in all respects with an authentic sample of lecanoric acid ($C_{16}H_{14}O_7$) isolated earlier[2] from another lichen *Cycloplaca almorensis*. This is first report of its occurrence in *Parmelia andina*.

The extracts of lichens are known to exhibit antibiotic[3], fungistatic[4] and mitotic inhibitory[5-7] properties. The mitostatic action of lecanoric acid was not tested previously although its effects in aqueous solution on mitotic divisions in *Allium sativum* have been noticed[6,7]. In the present work an attempt has been made to study the mitostatic and chromatoclasic effects[8] of lecanoric acid in alkaline medium (the compound has been found insoluble in water) on mitosis in roots of *Allium cepa*. In the squash preparations, the authors have noticed some chromosomal abnormalities and strong mitostatic action of the lecanoric acid.

Germinating bulbs of *A. cepa* with their roots, 2–3 cm long were kept in 0.1%, 0.2% and 0.3% of lecanoric acid in 10% aqueous $NaHCO_3$ for 4 hr at 28° ± 2° C. Controls in 10% sodium bicarbonate solution were studied simultaneously. The root tips after treatment were fixed in a mixture of absolute alcohol and acetic acid (3 : 1), hydrolysed in N HCl at 60° C for 5 min and squashed in haematoxylin. Three microscopic fields were scanned for qualitative and quantitative data. The number of cells with or without division were also noted. The mitotic index was calculated on the basis of the number of dividing cells per 100 observed.

The mitotic abnormalities produced by the lecanoric acid are shown in figures 1–4.



Figures 1–4. Mitotic abnormalities induced by Lecanoric acid in *A. cepa* root tips. **1.** Tetrapolar nuclei. **2.** Thinning of chromosomal matrix. **3.** Vacuolated interphase nuclei. **4.** Telophase bridge. (All × 675).

The effect of lecanoric acid on cell division can be recognised by way of reduction in mitotic index (MI) and the total inhibition of anaphase. The steep decline in MI is directly proportional to the increase in the concentration of the lecanoric acid (MI values: control—9.4, $NaHCO_3$—8.3, 0.1, lecanoric acid—4.6, 0.2–3.1 and 0.3–1.3). The proportion of cells belonging to various phases were analysed and this could suggest that with an increase in concentration, the frequency of cells belonging to anaphase decreased (Anaphase index values: Control—1.9, $NaHCO_3$—1.1 and 0.1, lecanoric acid—0.3, 0.2 0.1 and 0.3 0) whereas all other mitotic stages were found comparatively less affected.

In the present study clumping, tripolar and tetrapolar nuclei, vacuolated interphase nuclei and thinning of chromosomal matrix were noticed besides the bridges, lagging of chromosomes binucleate cells and