group (a) non-pregnant cows (that had calved within the previous three months) also suppressed the germination (49.51%) and shoot growth (1.21 cm) of wheat seeds and was on par with that of pregnant cows. In other words, urine of pregnant cows dramatically inhibited the germination and shoot growth of wheat seeds compared to that of non-pregnant cows. This inhibitory effect appears to persist for about three months after calving, though to a lesser extent and subsides later.

The diluted urine of all the three categories was found to have similar pH values (Table 1), indicating that the suppression of seed germination and shoot growth is not due to pH. We have not yet been able to identify the inhibitory factor. But the mammalian urine is known to contain auxins, the plant growth regulators that have unequivocal effect on germination of seeds[2,3]. In fact the human urine was one of the major sources for auxins[2,3] during early 1930s. It is likely that the enhanced levels of such hormones in urine during pregnancy of cows might be causing the observed inhibition of germination of wheat seeds.

Diagnosing the pregnancy of cows at an early stage is of considerable economic value in dairy management. The currently available laboratory techniques of diagnosing pregnancy in cattle are laborious, costly and not practicable in the rural areas of the developing countries such as India. In this context, a simple test based on the effect of urine on germination of seeds might hold great promise.

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New find of acicular-radial and cauliflower-shaped calcite spheroids from the intertrappean beds of Jabalpur District, Madhya Pradesh

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The present note records the occurrence of 'acicular-radial' and at places 'cauliflower'-shaped calcite spheroids from the intertrappean limestone of Jabalpur district, MP. X-ray diffraction studies confirmed that they were calcite.

THERE is a widespread occurrence of Intertrappean beds in the Lower Deccan Volcanics[1]. Occurrence of an intertrappean bed from Jabalpur district was first reported by Rao[2]. New occurrences of two distinct intertrappean beds termed Khamaria intertrappean bed and Barela intertrappean bed towards the south and north of river Narmada respectively are now known[3]. Limestone overlain by cherts constitutes the main litho-units in the area.

Calcite commonly exhibiting acicular, radiating habit occurs in the uppermost part of an intertrappean limestone bed, especially where the overlying cherts are missing (Figure 1). Calcite spheroids occur in all the localities under investigation, viz. Barela (23°06' N: 80°04' E), south of Khamaria (23°01' N: 79°54' E).

Figure 1. *a*, Acicular-radial calcite from the Khamaria intertrappean bed, Jabalpur district, MP. *b*, Cauliflower-shaped calcite spheroids from 2 km south-west of Manegaon, Jabalpur district, Madhya Pradesh.

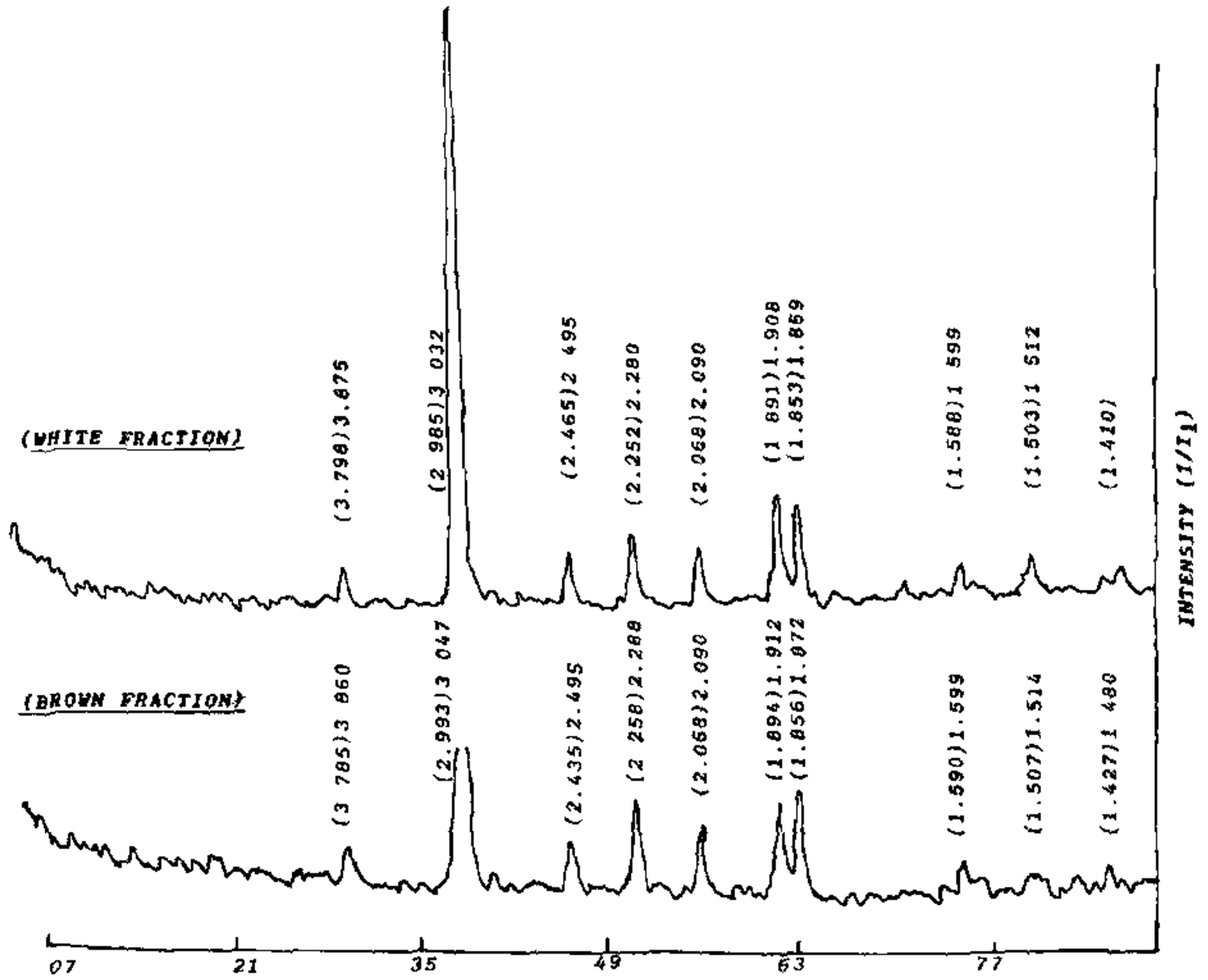

Figure 2. X-ray diffraction pattern of acicular-radial calcite from intertrappean beds of Jabalpur District, Madhya Pradesh (Note values mentioned outside the brackets are corrected values)

south-west of Manegaon (23°04' N: 79°53' E), south of Kahani (23°01' N: 79°51' E) and south-east of Jodhpur (23°06' N: 79°53' E). However, their quantity varies, the maximum development being recorded on a hill-top 2 km south-west of Manegaon constituting a meter thick horizon of cauliflower-shaped spheroids formed by cementation of spheroids one above the other (Figure 1*b*). When broken they display an acicular radiating habit. Such cauliflower-shaped spheroids of diameter up to 325 mm were collected from the said locality.

Acicular-radial calcite from Barela intertrappean has a spotted appearance with light brown/flesh-coloured and white patches whereas calcite from Khamaria intertrappean is typically light grey in colour. The specific gravity varies from 2.71 to 2.75. These values are closer to the specific gravity of calcite (2.71) rather than that of aragonite (2.93). Under microscope they appear colourless, displaying both twinkling and rhombohedral cleavage, high-order grey interference colours and lamellar twinning. The light-brown and white fractions of Barela intertrappean carbonate material were separated out and subjected to X-ray investigations which confirmed both fractions to be pure calcite (Figure 2).

The physical characteristics give a mistaken impression that the acicular-radial carbonate spheroids may be aragonite. Since the present studies confirm their being calcite, the occurrence of the so-called fibrous-radial aragonite reported from the intertrappean beds of Sagar district, MP[4–6], and Barwaha-Katkut area of Khargone district, MP[7], becomes doubtful.

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