

treatment with a single dose of 0.4 g/kg did not show any significant ($P > 0.05$) effect, repeated treatments of the extract for 3 days (five doses) brought about a significant ($P < 0.05$) fall in mean BSL (table 2). There was a significant fall in the BSL of the extract-treated animals 1 hr after glucose treatment.

It is concluded that the alcoholic extract of the leaves of *B. spectabilis* at a dose level of 0.4 g/kg has significant hypoglycemic effect in normal as well as alloxan-induced diabetic mice and it is free of any acute toxicity. Further experiments are in progress with bigger animals to evaluate the efficacy of the drug.

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BIOLOGICAL SIGNIFICANCE OF 37°C PHASE TRANSITION IN CHOLESTEROL

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CHOLESTEROL is an essential component of various biological membranes and body fluids. The under-

standing of the diverse natural and pathophysiological roles of cholesterol would depend on a thorough knowledge of its physicochemical properties. The much neglected but most striking among these is the occurrence of a phase transition at 37°C. That such a biologically significant molecule should exist in two polymorphic phases corresponding to temperatures just below and above normal human body temperature is perhaps physiologically unique. It is possible that the sharp overlap of the phase transition temperature with physiological temperature is an accidental one. However, considering the nature of evolutionary process it seems less likely that such a unique feature would entirely remain biologically unimplicated. We clarify here certain aspects of this phase transition as there might be more to it than its already speculated¹ implication in atherosclerosis.

The phase transition (37°C) studies of cholesterol reported so far¹⁻⁷ in general pertain to anhydrous cholesterol and inferences drawn therefrom may not be relevant to the *in vivo* situation, since cholesterol is known⁸ to exist as hydrated species *in vivo*. A clear evidence for the occurrence or nonoccurrence of the phase transition in the latter seems to be lacking^{4, 6, 7}. Differential scanning calorimetric (DSC) studies were made on authentic cholesterol samples, and phase transition was observed even in the hydrated species as seen in figure 1. Further, DSC scans were also made on a system consisting of cholesterol, human serum albumin and water. We expect binding of the serum protein to cholesterol in this system. Here again, the endotherm persists (also shown in figure 1). These results unambiguously show that the 37°C phase transition observed in anhydrous cholesterol also occurs in the hydrated species and even when presumably it is bound to a serum protein.

Another aspect, which needed clarification, was to see whether the observed phase transition in any way depends on the heating rates likely to be encountered in the *in vivo* situation. Several DSC scans were obtained with various heating rates down to 0.5°C/min. Not only the endotherm persisted but also showed no significant temperature shift in the phase transition.

Most of the cholesterol found in the blood stream is not present as unesterified cholesterol but as cholesteryl esters. A few of these derivatives have been reported⁹ to show the phase transition, a point to be verified in our further studies.

The suggestion of Lubowitz¹ that the etiology of atherosclerosis would be attributed to the departure of a person's body temperature from 37°C, is over simplification in explaining a complex issue as athero-

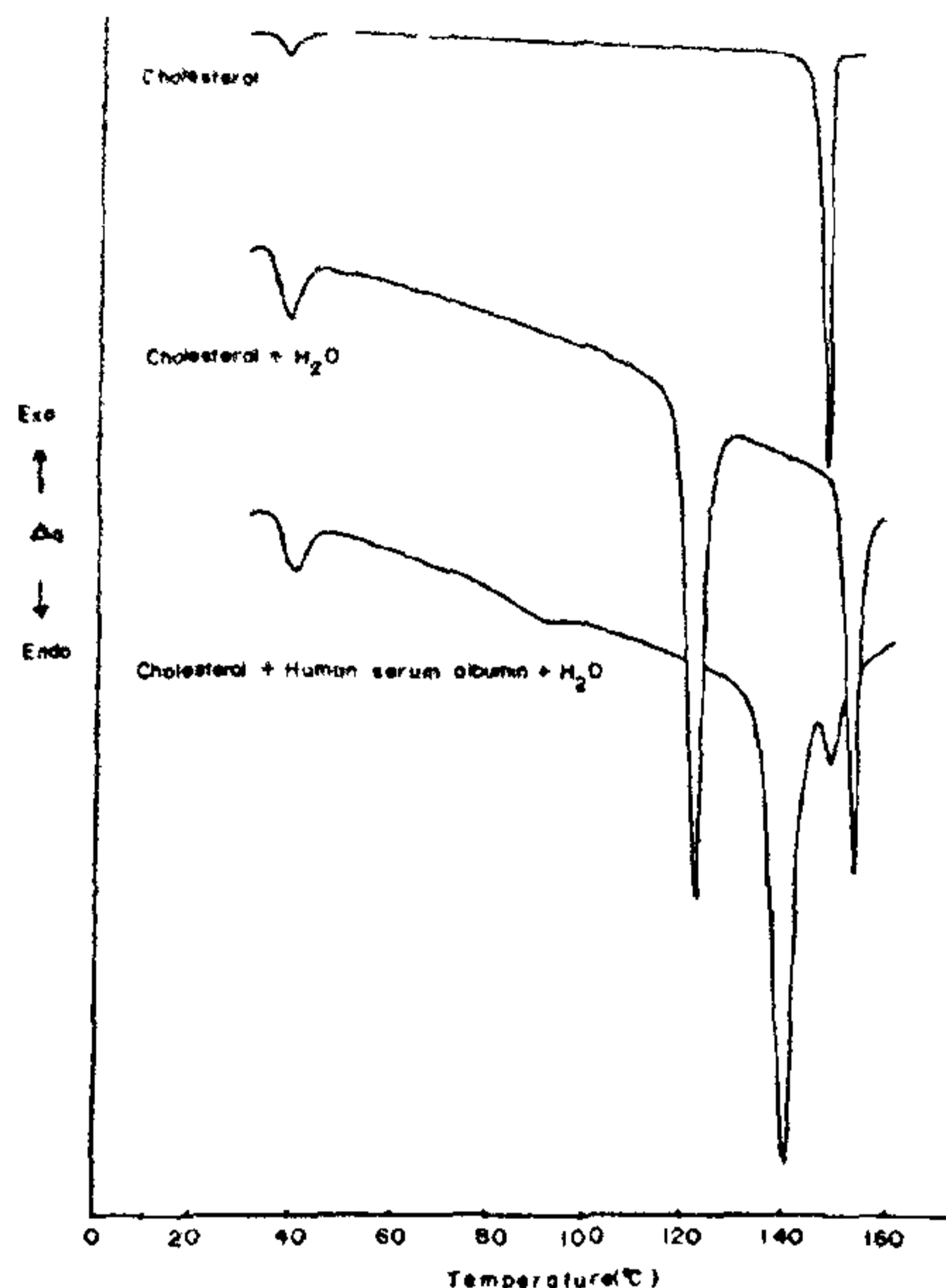


Figure 1. Differential scanning calorimeter scans of cholesterol, cholesterol + H₂O and cholesterol + human serum albumin + H₂O. Samples were crimped in aluminum pans and the heating rate was 10°C/minute.

sclerosis. Nevertheless, unesterified cholesterol is known to be an important component of atherosclerotic plaques and the involvement of the phase transition would still remain a possibility. It would also be interesting to contrast various implications of cholesterol with respect to homiotherms and poikilotherms. Homiothermy is the characteristic of the highest form of life. Whether the 37°C phase transition in cholesterol is in any way of significance in maintaining or imposing the need for the constancy of physiological temperature around 37°C in higher forms of life needs to be explored in an evolutionary context.

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***OCIMUM ADSENDENS*: AN INDICATOR PLANT OF CHROMIUM**

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SEVERAL plant indicators have been suggested to locate groundwater¹ and economically important metalliferous ore deposits^{2-4a}. In this study, *Ocimum adsendens* has been found to be an accumulator of chromium to serve as an indicator plant for this heavy metal.

The area, under investigation, is Kondapalli Reserve Forest in Krishna district, Andhra Pradesh, included in the Survey of India toposheet No: 65D/10. The geological formations, in this area, are khondalite and charnockite suite of rocks, ultramafics including chromite, and quartz and pegmatite veins. Earlier workers⁵⁻⁹ have studied the geology of the area.

The chromite ore occurs as massive bodies, irregular veins, lenticular and pocket-like lenses, or as dark bands in layered rocks. All these chromite occurrences are distributed in an area of ten square miles in the Kondapalli hill range. Brown and Day¹⁰ described this deposit while other workers^{9, 11, 12} studied its mineralogical characters.

The most conspicuous feature of this area is the dominance of the plant *Ocimum adsendens*, locally called "Konda Tulasi" occurring exclusively overlying the chromite ore body. It is absent on the soil derived from any other geological formation. It occurs with profuse growth in the mining areas, and also right on the dumps of the concentrated ore (figure 1). It is also