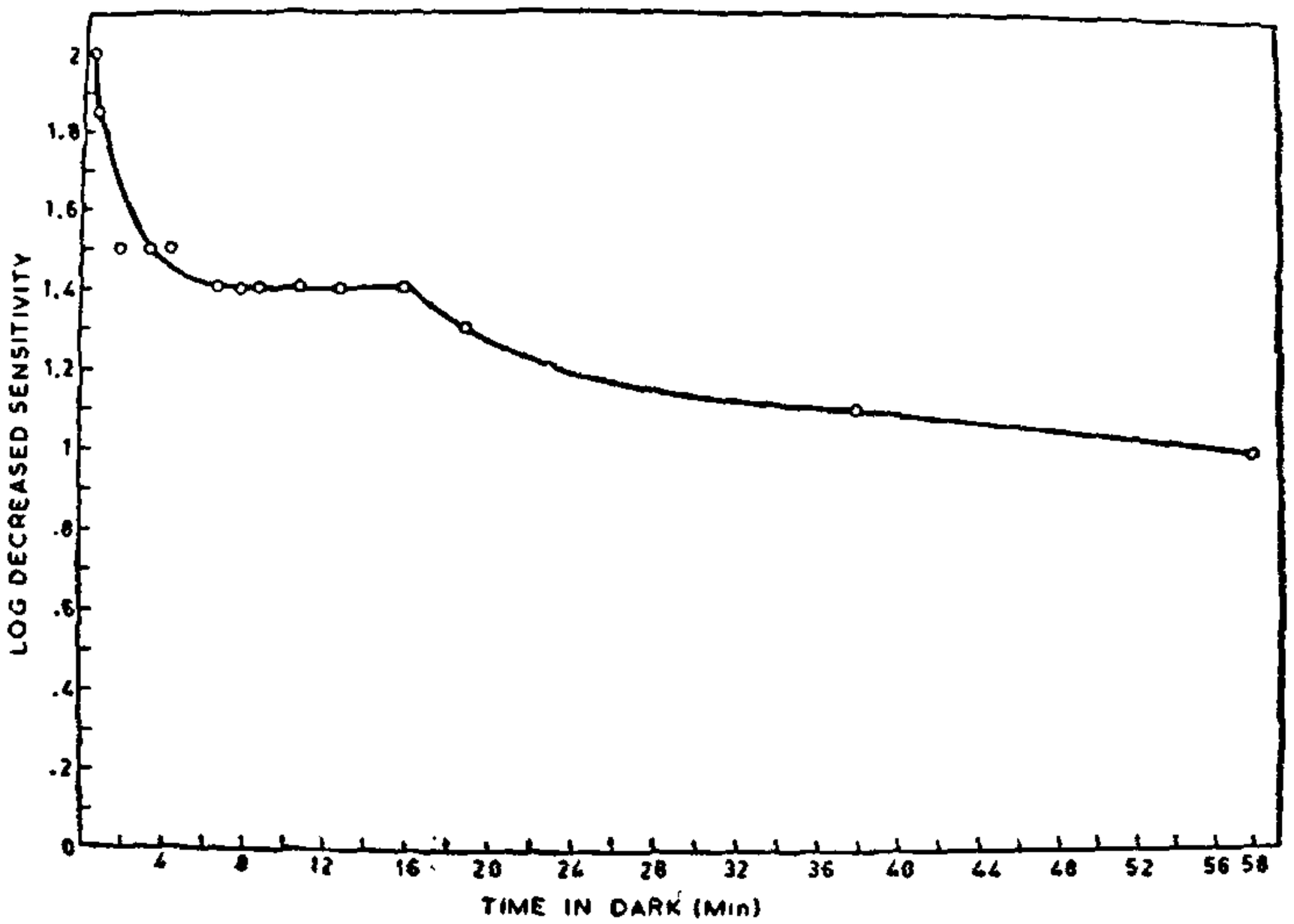

FIG. 4. *Herse convolvuli*: Adaptation curve.

positive 'off' components. This is in contrast with what is generally reported in the literature, concerning the night active insects[5,7].

Adaptation response of the moth, on the other hand, is typical of dusk or night active insects. The two phases relate to the combined effect of photochemical and photomechanical events[2–4].

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PHYSIOLOGICAL ALTERATIONS IN THE LEAVES OF *BUCHANANIA LANZAN* DUE TO PSYLLID GALLS

S. UMESH KUMAR
Department of Botany, PSG College of Arts and Science, Coimbatore 641 014, India

A. RAMAN
Department of Botany, Loyola College, Madras, India

AND

M. SHEIK ABDUL KADER
Department of Biology
Railway Mixed Higher Secondary School
Golden Rock, Tiruchy 620 004, India

WORK on comparative physiology on the metabolism of sugars and proteins in relation to gall formation appears meagre though the protein concentration in terms of amino acids of susceptible host plants under the influence of *Selenothrips* and synthesis of amino acids with the labelled carbon on oak galls caused by *Biorhiza* and *Neroterus* have been demonstrated[1–3]. In this paper we report the physiological alterations in the leaves of *Buchanania lanzan* Spreng. under the influence of a psyllid gall.

Locally available mature, psyllid galls of *Buchanania lanzan* were segregated from the host leaves and the

gall inducing larvae were isolated by splitting the galls. Normal leaf portions almost of the same age and larvae free galls (hereafter referred to as galls) were used for study.

Total protein concentrations in the normal leaves and galls were estimated[3] after precipitation with 10% trichloro acetic acid. The extracts of both normal leaves and galls were made in 80% ethyl alcohol and acetone with 0·5 ml isopropyl alcohol as preservative. The free amino acids were separated by descending two-dimentional paper chromatography[4]. The total carbohydrates in 100 mg of dried leaf powder was estimated by calorimetric method[5]. The chlorophyll concentrations in the acetone (80%) extract was determined by direct measurements using spectronic '20[6].

There was a decrease in the concentration of total proteins in the galls compared to the normal leaves. The galls showed higher concentrations of leucine and iso-leucine when compared to normal leaf portions. Further, it had two additional amino acids, aspartic acid and hydroxy proline.

Estimation of total carbohydrates indicated a marked reduction in the galls. While the normal leaf portions had a carbohydrate concentration of 1·30 mg/g weight of leaf tissue, the infected portion had only 0·52 mg of carbohydrates/g weight of leaf tissue. The concentrations of chlorophylls *a* and *b* also decreased due to galling (chlorophyll *a* from 0·78 to 0·35: chlorophyll *b* from 0·93 to 0·50).

Decline in the protein content while increase in the amino acid concentration and accumulation of new amino acids can probably be explained with Vidyasekaran's[7] hypothesis, that proteolysis occurs during pathogenesis or as Goodman *et al.*[8] have proposed it could be due to the blockage of protein synthesis. While the galls exhibited increase in the concentration of amino acids, there was a significant drop in the total carbohydrate content. It is probable that the synthesis of amino acids is related to the decrease in the concentration of carbohydrates, supported by the fact that close metabolic relationships exist between 'head' compounds of each family of amino acids and carbon dioxide fixation and tri-carboxylic acid cycle[9]. It is also possible that reduction in carbohydrate content could be due to impairment of photosynthetic activity.

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REVERSAL OF DIKEGULAC-SODIUM INDUCED CHLOROPHYLL DEGRADATION AND CHLOROPHYLLASE ACTIVITY IN *HELIANTHUS ANNUUS* BY UREA

S. S. Purohit and K. Chandra
Department of Botany
Government Post-Graduate College
Nagaur 341 001, India

Dikegulac-sodium (sodium-7,3 : 4, 6-di-0-isopropylidene-α-xylo-2-furanosonate) or ATRINAL(R) is a biologically active new growth regulator which exhibits diverse effects on plant growth and development[2–9]. Recently, Purohit and Chandra[9] have shown that dikegulac-sodium induces senescence in detached leaves of *Avena sativa*, and loss of chlorophyll presumably mediated by increased levels of chlorophyllase. This work was extended to understand the hormonal induced senescence and its reversal by nitrogenous compounds which promote chlorophyll synthesis[4,11].

The fruits of *Helianthus annuus* L. var. EC 68414 were sown in mud pots (10 × 15) containing soil mixed with farm yard manure under natural day (11–13 hr) and temperature (25°–32°). Twenty-day plants were sprayed with distilled water or test solutions (Dikegulac 100, 250, 500, 750 mg/l and dikegulac 750 mg/l with 100, 250, 500 mg/l urea) on alternate day at 7·00 a.m. Ten pots were treated with each solution. On 50th day, leaves from each treatment were separately collected and washed with distilled water. Chlorophyll content and chlorophyllase activity were estimated in triplicate[9].

Data (Fig. 1) reveal that all the concentrations of dikegulac-sodium inhibited chlorophyll content. This