TABLE I

Effect of exogenously modified pH values on growth and sex induction in male and female clones of Bryum argenteum. *Mean values and standard error are from 12 replicates of 40-day-old cultures*

pH of the medium	Number of gametophores per culture		% of gametophores per culture showing sex induction	
	Male	Female	Male	Female
4·5	48±2	53±2	41±2	38±2
5·5	63±5	73±3	52±2	43±2
6·2	64±5	74±3	53±3	45±3
7·0	58±2	67±3	48±2	40±2

nothing to do with the onset of reproductive phase. It is probably due to increase or decrease in uptake of particular ions by the plant or because of exudation of certain active principles by the plant into the medium. Thus, change in pH of the medium appears to be one of the effects of these morphogenic changes rather than its cause.

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ELECTRORETINOGRAM STUDIES ON HAWKMOTH AND COCKROACH COMPOUND EYE

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ELECTROPHYSIOLOGICAL studies on two nocturnal insects, *Herse convolvuli* (a hawkworm moth found commonly in Southern India) and *Periplaneta americana*, were carried out. As against the common belief[1] that slow eyes of night active insects do not show an 'off' response, we detected a regular and marked 'off' response in both of the above insects. The amplitude of 'on' response for the moth as a function of relative intensities and pulse duration was determined. The 'off' response was not large enough for low intensities to permit a quantitative description. Adaptation experiments were also performed for the moth eye.

The specimens used in this experiment were wild type, of either sex. The experimental animals were intact but legs, thorax, and head were rigidly immobilised with bee's wax and colophony and fixed to a stage.

Fine platinum wires (0·01 μ) served as electrodes. The recording electrode was placed in a small hole, made in the cornea, by an insect needle. The reference electrode was inserted close to the eye. Both electrodes were connected to the differential inptus of a Tektronix 5110, 5A21N oscilloscope and the results were photographed.

The insects were placed in a metallic chamber which served both as a Faraday cage and a dark chamber.

For stimulation, a 150 W, tungsten lamp was used. Calibrated neutral density filters were used to vary light intensity. The infra-red radiations were excluded by using a heat filter. The light path was interrupted by a photographic shutter. An optical guide was used to direct the collimated light beam to the experimental eye. Relative light intensity, incident on the insect eye was determined with the help of an optometer. The maximum intensity (Log I = 0) corresponded to 220 foot candles.

Light pulses of duration 1/125 to 1 seconds were used[2] to elicit ERG responses over the intensity range of 3 log units. An interval of one or two minutes between successive light flashes allowed the eye to recover its sensitivity fully.

The amplitude of 'on' component of ERG served as a good indicator of the sensitivity of the moth eye to the intensity and duration of light stimulus.

Adaptation experiments involved light adaptations of the moth eye and subsequent recovery of its sensitivity in darkness. The recovery was followed by administering test flashes to the light fatigued eye and comparing the response with that of the norml eye.

RESULTS

Electroretinogram Waveforms

ERGs recorded from dark adapted eyes of *Periplaneta americana* and *Herse convolvuli* are presented

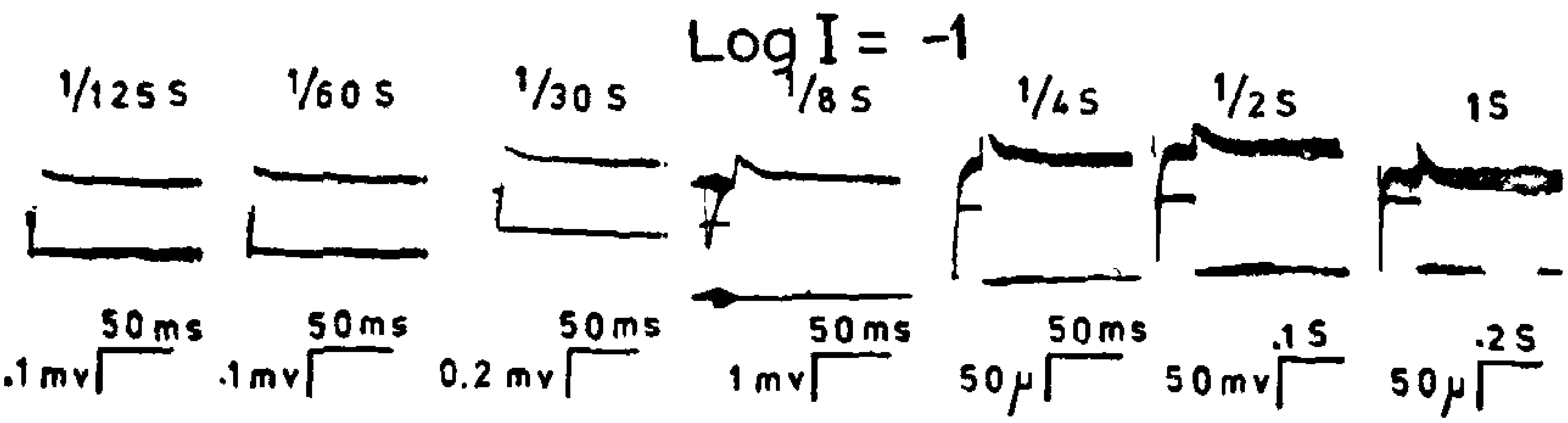

FIG. 1. *Periplaneta americana*: ERG responses at various stimulus durations. The 'off' component separates from 'on' component at 1/8s exposure time.

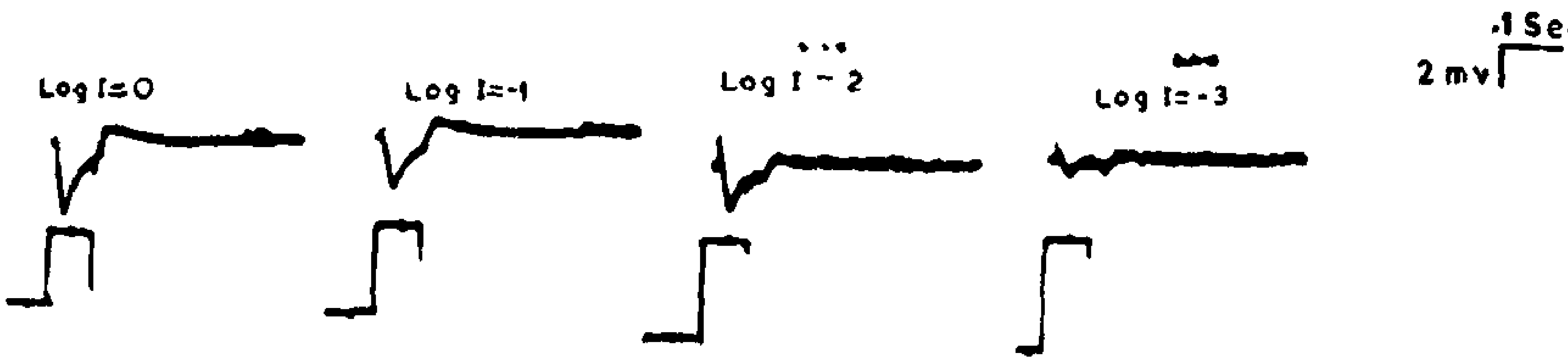

FIG. 2. *Herse convolvuli*: ERG responses at various intensities. The stimulus duration is 1/15 s A distinct and separate 'on' and 'off' components are seen.

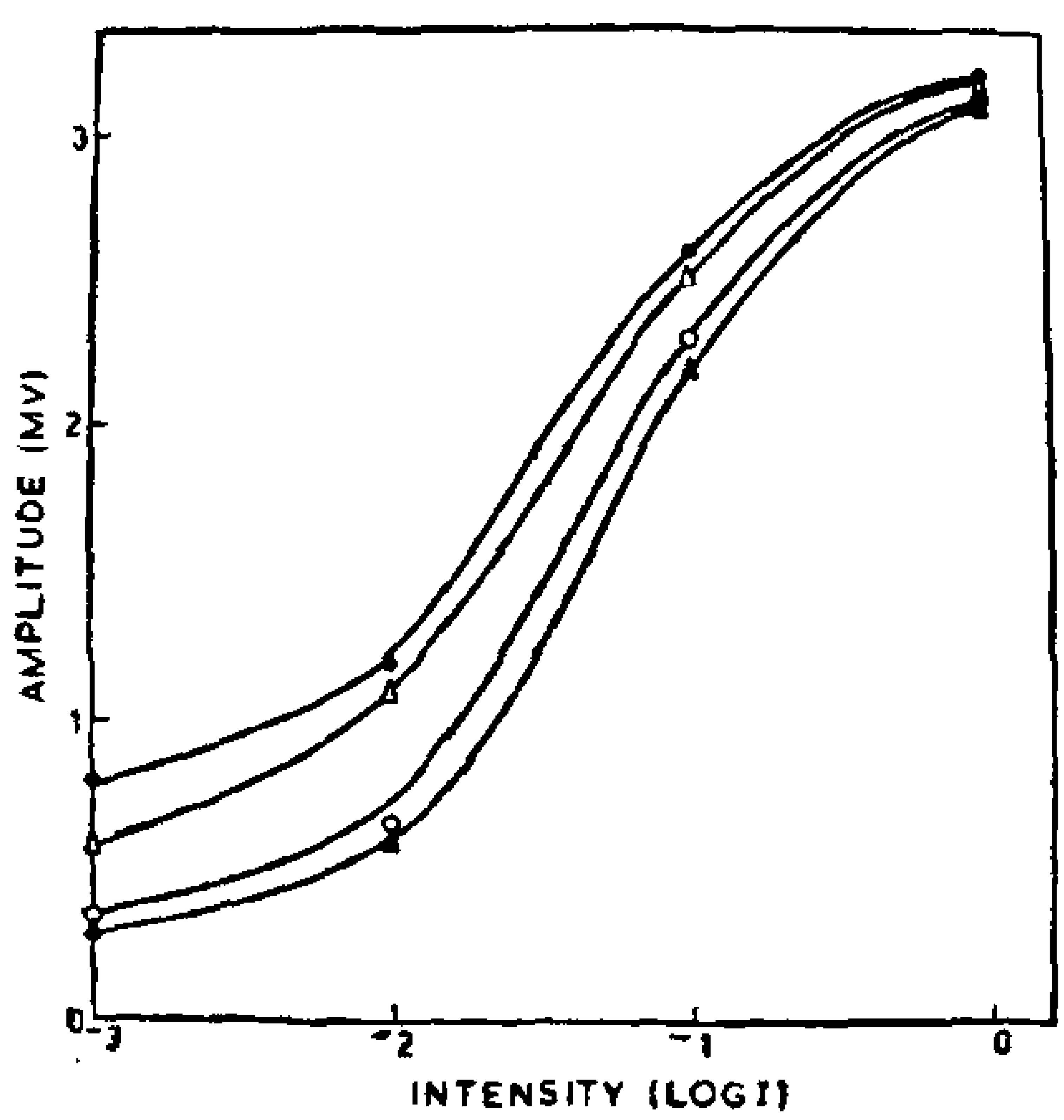

FIG. 3. *Herse convolvuli*: Amplitude of 'on' effect plotted as a function of Log I. The stimulus durations for the curves (▲) is 1/60 s, (o) 1/30 s, (△) 1/15 s, (●) 1/8 s.

in Figs. 1 and 2. These are characterised by a sharp negative potential at the onset of light stimulus followed by a slow positive one. When the duration of stimulus is increased, a positive 'off' component appears at the end of the stimulus. On further increasing the exposure time, the 'off' component gradually separates out, and is distinctly seen. The separation takes place at the same stimulus duration for all intensities in either case. For *P. americana* this critical exposure time is 1/8th of a second and for *H. convolvuli* it is 1/15th of a second. This separation of 'on' and 'off' components, is determined by stimulus duration rather than intensity[8,9].

The 'on' component of ERG of moth eye bears a sigmoidal relationship to the relative intensity plotted on a logarithmic scale. (Fig. 3). The 'on' response has a latency period of 25–40 ms in the intensity range of 220–222 foot candles.

Adaptation Experiments

The adaptation curve for the moth was constructed according to the method described by Ruck and Jahn[6] and is presented in Fig. 4. Dark adaptation of the moth eye occurs in two stages. The first phase of adaptation lasts for about 17 minutes and involves an increase in sensitivity over the range of 0·6 log units. The second phase covers an intensity range of 0·4 log units and is not complete until after more than 57 minutes.

It is concluded that ERGs recorded from compound eyes in hawkmoth *H. convolvuli* and cockroach *P. americana* are biphasic with a negative 'on' and a

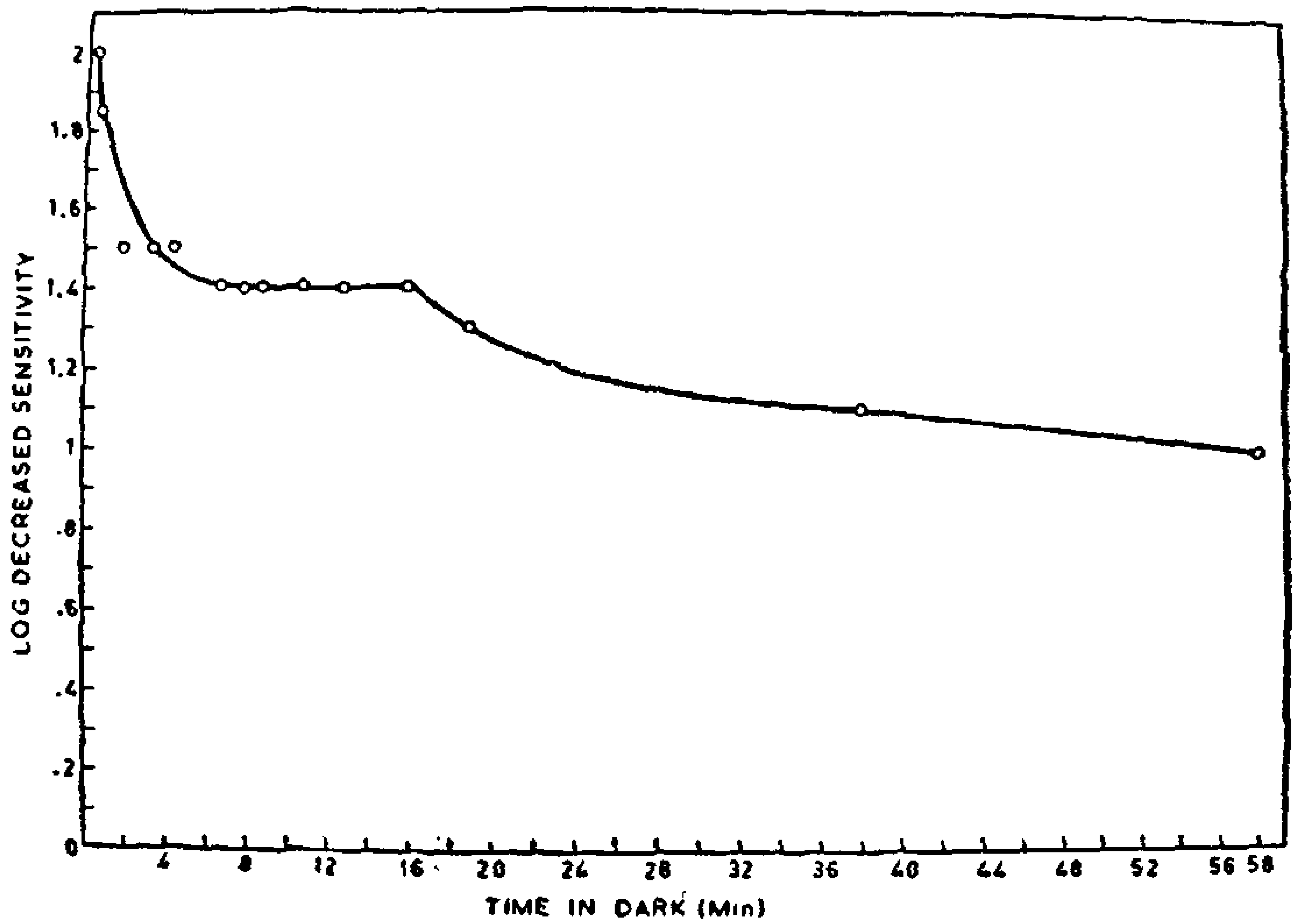

FIG. 4. *Herse convolvuli*: Adaptation curve.

positive 'off' components. This is in contrast with, what is generally reported in the literature, concerning the night active insects[6,7].

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

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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