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Shadravan, F. and J. McDonald. Iowa State University, Ames, Iowa. The effect of environmental 2-propanol on the ability of flies to survive in alcohol environments.

Anderson and McDonald (1980) have recently demonstrated that Drosophila exposed to an environment containing 2-propanol undergo (1) a post-translational conversion of their alcohol dehydrogenase, (2) a significant drop in ADH specific activity, (3) an increase in ADH in vivo stability, and (4) a consequent increase in in vivo levels of ADH. These authors suggest that this phenomena may have adaptive significance for Drosophila living in those environments abundant in secondary alcohols (e.g., Heed 1978) by preventing the production of highly toxic ketones. A second prediction which follows from these data is that Drosophila exposed to environmental 2-propanol should be more sensitive to the toxic effect of alcohols due to a decrease in ADH specific activity. In this note we present the results of a study designed to test this prediction.

The strains used in this study are F-2 and S-1 as described by McDonald et al., 1980. These flies are completely homozygous (McDonald and Ayala 1978) and are fixed for an ADH-fast (F-2) and ADH-slow (S-2) allele. The relative survivorship of flies pretreated with 2-propanol and non-pretreated were examined at 0, .125, .250, .500, 1.00, 3.00, 5.00 and 8.00% ethanol. For each experiment 6 vials (3 vials of females, 3 vials of males) each containing 10 flies (6-10 days post-eclosion) were set up for each strain and alcohol concentration tested. Flies were allowed to fully recover from very light etherization for a period of 1-2 hours before

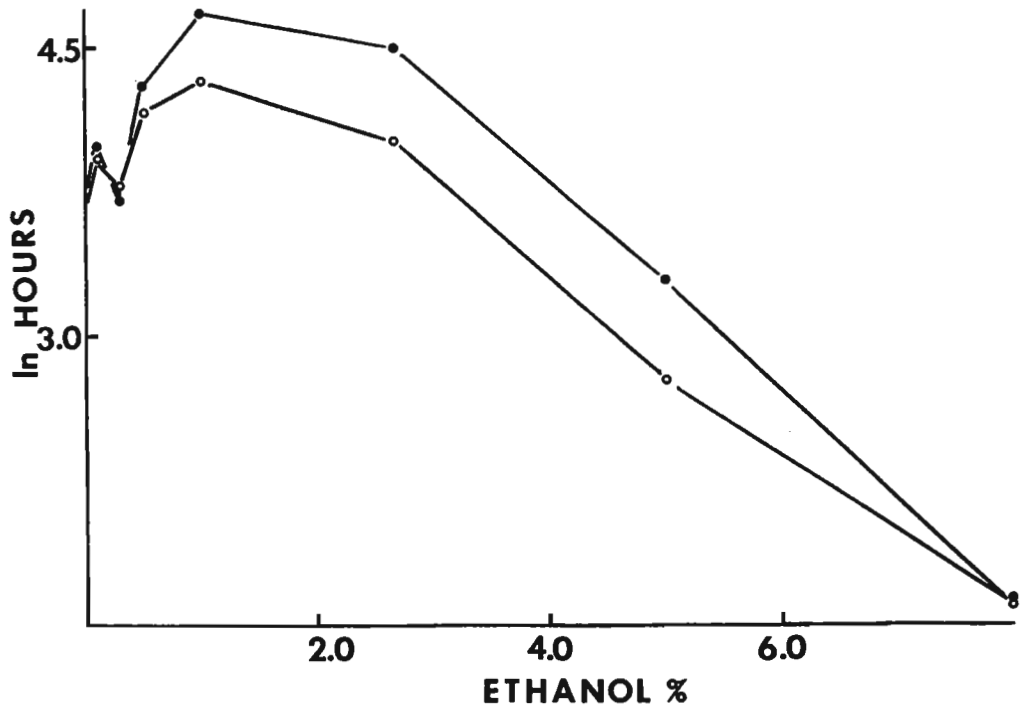

Fig. 1. Mean longevities given in lh(hr) for Fast strain exposed to increasing concentrations of ethanol. Closed circles are control flies and open circles are pretreated flies with 1% 2-propanol for 1 day.

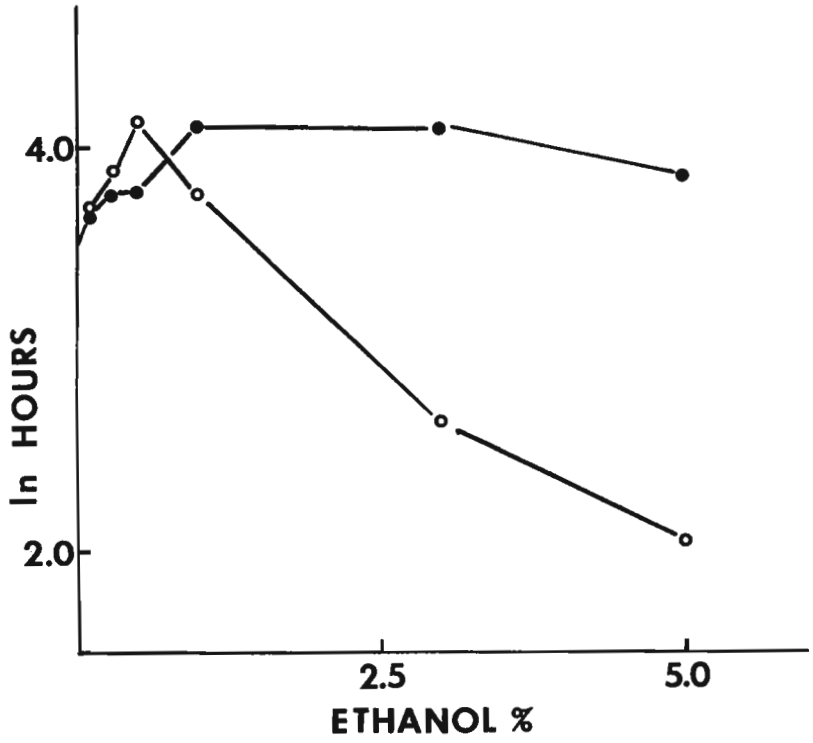

Fig. 2. Mean longevities given in ln(hr) for Slow strain exposed to increasing concentrations of ethanol. Closed circles are control flies and open circles are pretreated flies in 1% 2-propanol for 1 day.

the test was initiated. Initiation of a test consists of adding to each vial a 2.00" x 2.00" filter paper tab (Watman #1) which had been saturated with 1 ml of either H_2O (control) or a test alcohol-H_2O solution of a specific concentration. Vials are immediately sealed with parafilm and placed in the incubator (25°C, constant humidity and lighting). The number of flies alive in each vial are observed and recorded (every 5 hours for high alcohol concentrations, every 10 hours for low alcohol concentrations). Mean % survivorship at each alcohol concentration is plotted vs. time. From these "primary plots", we graphkcally determined mean hrs to 50% mortality at each alcohol concentration and use this information to construct secondary plots (ln hrs to 50% mortality vs. alcohol concentration) as devised by Starmer et al. 25 hrs exposure of flies to 2-propanol pretreatment which consists of the addition to a food bottle of a Kimwipe absorbed with 1 ml of 1% 2-propanol solution. The results presented in Figs. 1 and 2 demonstrate that 2-propanol pretreated flies are in fact more sensitive to ethanol than non-pretreated flies. These results are analogous to the results recently reported by Papel et al. (1979) which demonstrate that pretreatment with acetone (the oxidized product of 2-propanol) also reduces the viability of Drosophila in alcohol stress environments.

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Shitamoto, T. and H. Ikeda. Ehime University, Matsuyama, Ehime, Japan. Differences in the diurnal rhythmicity of mating activity in D. melanogaster.

Two strains of D. melanogaster were compared with respect to the diurnal rhythms of mating activity. Strains used are J^5, a wild type laboratory strain, and Bw, a brown eye color strain. Flies were reared and aged in the LD cycle, which was set as follows: a light phase (200 lux), 7:00-17:00; a dark phase, 19:00-5:00. Dim light phases were set for two hours between the dark and the light phases both in the late afternoon and in the early morning. Observations of matings were carried out in the light (200 lux) and also in the red light. Fifteen 5- or 6-day-old males and ten 5- or 6-day-old females were introduced into an observation vial. The number of matings per 5 min. interval was scored during a 30-min. observation period. A mating index was calculated by the formula proposed by Spiess et al. (1966), on the basis of data of 3 to 6 runs.