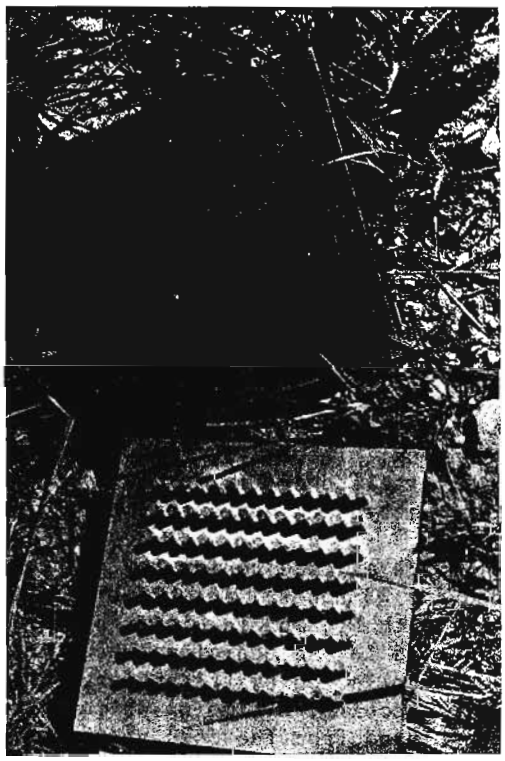
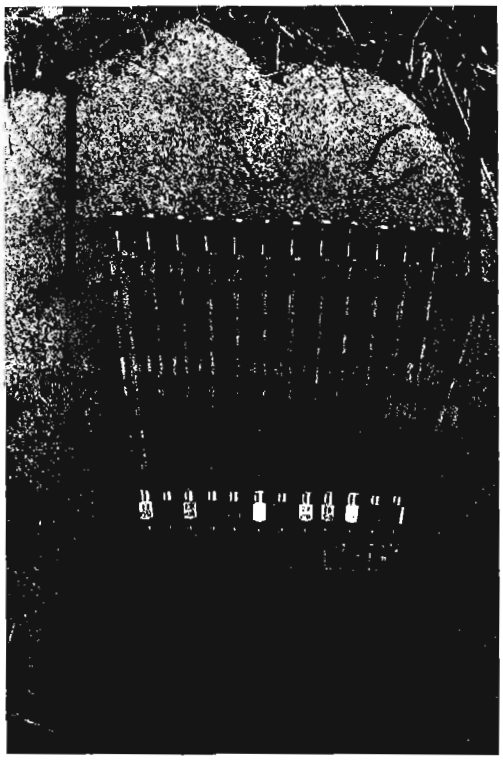
Roberts, R.M. University of Chicago, Illinois. A multiple sample homogenizer and multiple microsyringe applicator for acrylamide gel electrophoresis.

At present, flies to be individually electrophoresed on acrylamide gels are usually placed singly in centrifuge tubes and ground with a hand grinder in a precise volume of sucrose-buffer solution added to each tube with a single microsyringe. After centrifugation, the supernatant from each is transferred to the gel pockets with the microsyringe. The following devices, a multiple sample homogenizer inspired by Adamkewicz and Milkman (DIS 45: 192) and a multiple microsyringe holder, enable the worker to homogenize 96 flies similtaneously and to load 12 gel pockets at once in approximately the same time previously necessary to crush and load a single fly. A plate of plexiglass or brass drilled with 1/4-inch flat-bottomed holes, the same distance apart as the pockets of the gel, arranged in eight rows of twelve, receives the individual flies, which are mashed with a corresponding plate of 1/8-inch flat-bottom stainless-steel prongs. The desired volume of homogenizing buffer is placed in the holes 12 at a time with a plexiglass holder for 12 microsyringes; it consists of twelve 20-gauge syringe needles placed the same distance apart as the gel pockets, glued in a plexiglass sandwich, and a frame to support the syringe barrels, which can be removed for cleaning.





A bar under the plungers lifts them simultaneously to a height pre-set on two guide rods, which are simply long metal screws with a nut on each. The desired volume is set by adjusting the height of the nuts. In use, the flies are ground on a bed of ice; the homogenizer should not be allowed to stand on the ice bed for sufficient time for condensation to dilute the sample. The plate is tilted nearly upright so that the homogenate collects in the lower portion of the wells; the multiple holder then either loads the desired volume of homogenate directly into the gel pockets twelve at a time, or transfers the total volume of homogenate to conventional centrifuge tubes held in a row of twelve by a simple holder, should centrifugation be necessary for the desired assay. After centrifugation, the tubes are replaced in the holder for removal of the supernatant for loading. (I have found that centrifugation is not necessary for good separation of D. montana, D. virilis, and D. pseudoobscura esterases; it is likely that other enzyme systems similarly do not require centrifugation prior to electrophoresis.) If an eight-pocket gel is desired, the plate should be oriented to display twelve rows of eight wells, each the same distance apart as the eight pockets of the gel.