diameter tapered hole was drilled to accommodate the smaller diameter of the tips, and two slots were cut to allow for cutting the 200 uL pipette tip into the two sizes required to assemble a trap (see Figure 3).

References: Woodard, C., T. Huang, H. Sun, S.L. Helfand, and J. Carlson 1989, Genetics 123: 315–326.

Real-time visualization software for the TriKinetics Environmental Monitor (DEnM).

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TriKinetics behavioral analysis equipment is widely used for small-insect (in particular *Drosophila*) experiments where minute by minute insect locomotor behavior can be easily monitored for days or even weeks (Rund *et al*., 2012; Cavanaugh *et al*., 2014). In the case of circadian-biology experiments, this involves changing environmental conditions and monitoring the resulting locomotor response in the animal, or monitoring how behavior changes in the absence of any entraining environmental cues (zeitgebers) (Dunlap *et al*., 2004). However, for any behavioral experiment, verifying that no confounding experimental changes occurred is prudent. For this reason, TriKinetics has developed a *Drosophila* Environmental Monitor (DEnM) which continuously monitors light, humidity, and temperature levels and records these data in real-time to a computer spreadsheet in the same format as their behavioral monitors records locomotor activity. This format is very useful for data processing, is compatible with the popular ClockLab analysis program, but is still cumbersome to get a real-time reading (*e.g.*, What is the temperature *now* inside the incubator?) or daily verification that conditions were held steady or an anticipated environmental change indeed occurred (*e.g.*, Did the one-hour light pulse occur between 3:00 A.M. and 4:00 A.M. as scheduled?) without navigating through a large multi-column spreadsheet.

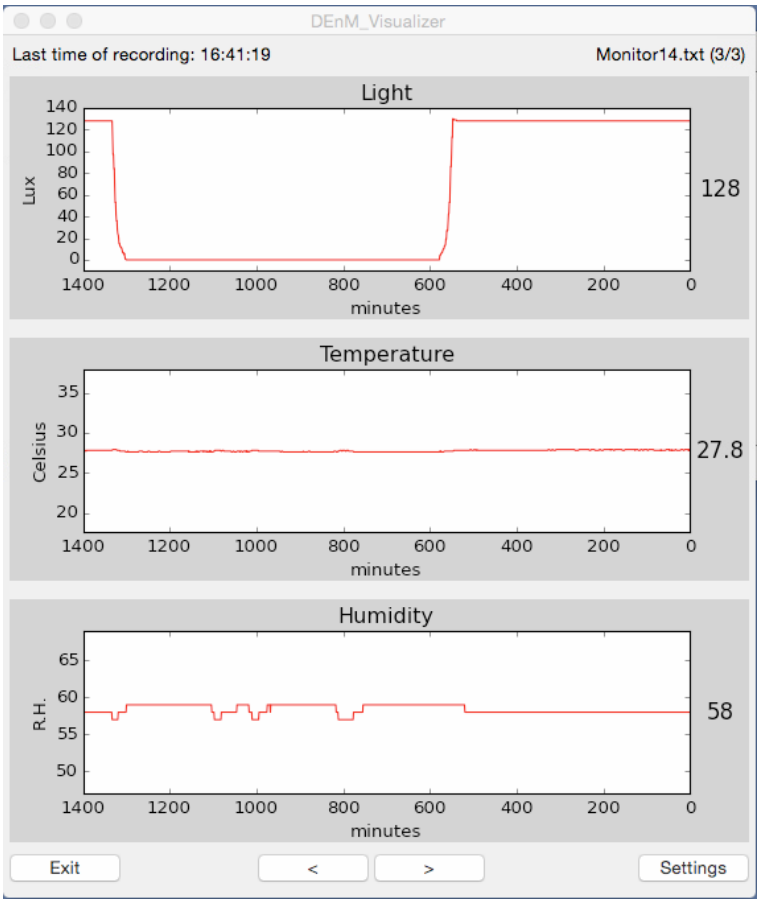
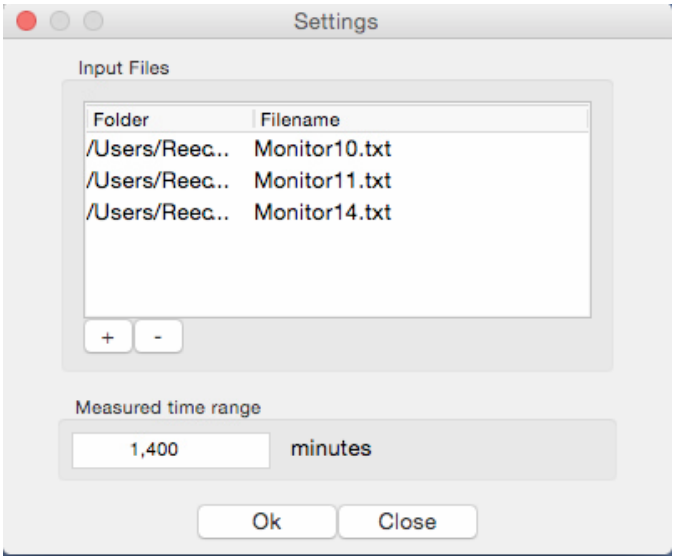


Figure 1. Screenshot of the main window of the DEnM_Visualizer program displaying the current light level (lux), temperature (Celsius), and humidity (%RH) in the incubator along with the previous 36 hours as recorded with the DEnM system.

For these reasons, we developed a tool we have called DEnM_Visualizer. DEnM_Visualizer is installed on the computer collecting data from TriKinetics units and provides real-time temperature, humidity, and light-intensity readings as



measured by one or more connected DEnMs. Additionally, the user may indicate a time-window to view historical sensor information, such as the last 24 hours. In our laboratory we find using these 24 hr readouts to be very useful in verifying new lighting-regime programs were initiated correctly, and there were no unexpected incubator faults that occurred overnight.

Figure 2. Screenshot of the settings window of the DEnM_Visualizer program demonstrating that the program can display the live data from multiple DEnMs (in this example, from units numbered 10, 11, and 14) and can display historical readings of a user-defined length.

DEnM_Visualizer is an open-source project and can be downloaded at https://github.com/samrund/DEnM_Visualizer. It is written in Python and has been tested on both Windows and Mac operating systems. The GitHub page has detailed installation instructions.

References: Cavanaugh, D.J., J.D. Geratowski, J.R. Wooltorton, J.M. Spaethling, C.E. Hector, X. Zheng, E.C. Johnson, J.H. Eberwine, and A. Sehgal 2014, Cell 157: 689-701; Dunlap, J.C., J.J. Loros, and P.J. Decoursey 2004, *Chronobiology: Biological Timekeeping*, Sinauer Associates, Sunderland Mass.; Rund, S.S.C., S.J. Lee, B.R. Bush, and G.E. Duffield 2012, J. Insect Physiol. 58: 1609-1619.

An efficient, practical, and reliable yeast shaker for *Drosophila melanogaster* culture.

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A few grains of dry yeast is beneficial to the establishment of new fruit fly cultures, but too much can result in the surface of the food being overgrown by the yeast. It is difficult to pour consistently a few grains of dry yeast into multiple new vials from an open container, and adding them by hand is slow. To overcome this problem, I have developed a "yeast shaker." The yeast shaker is made by using a dissecting needle to perforate the tip of a microcentrifuge tube only one time (Figure 1). This yeast shaker is simple to use. A single shake typically drops two to five grains. This simple method is fast, reliable, consistent, and inexpensive.

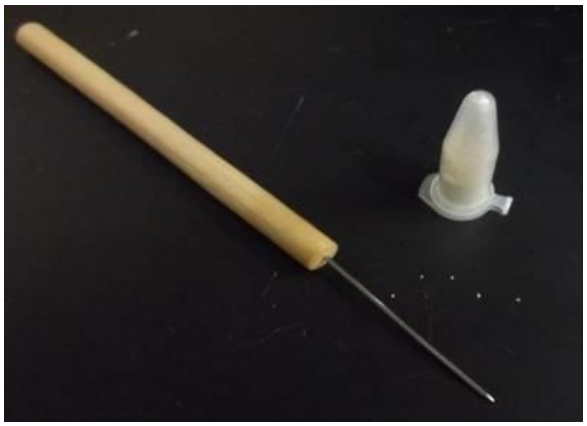

Figure 1. Dry yeast shaker (right), dissecting needle used to perforate the microcentrifuge tube (left), and five grains of yeast ejected by a single strong shake.