

Air Separation of Different Castes of the Imported Fire Ant^{1,2,3}

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The separation of individual caste members from a colony of fire ants, *Solenopsis* spp., is time consuming and can be painful, since it is not uncommon for worker ants to recover from anesthetization with CO₂ and to sting the person doing the separation. We therefore built a separator along the lines described by Bailey et al. (1970) for work with the imported fire ant, *Solenopsis saevissima richteri* Forel.

The separator makes use of the weight differential between caste members. Fig. 1 is a schematic.

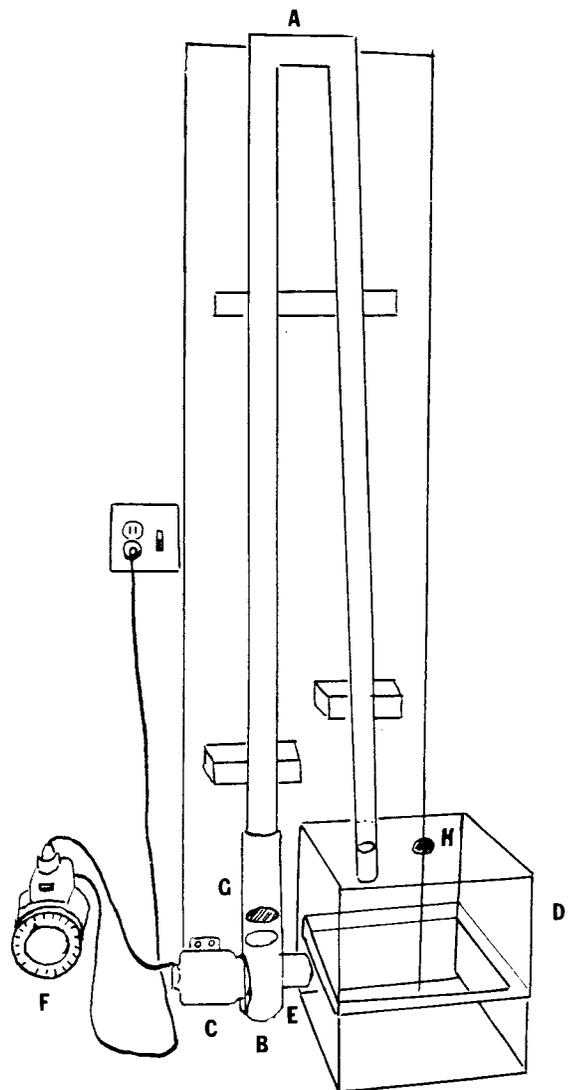
When the caste members of a colony of imported fire ants are to be separated, the ants are first anesthetized with CO₂. However, anesthetization must be complete, or the ants will become entangled with one another, which will result in poor separation. In our laboratory, we do not measure the amount of the CO₂ delivered, but we use the minimum amount that will insure complete immobility. The insert in the U tube is then $\frac{1}{2}$ filled with the anesthetized ants, and the CO₂ is turned on to keep the ants inactivated. When the blower is turned on, the lighter, smaller ants (minor and minor workers) are blown over into the right side of the tube and collected in the plastic box; the ants remaining in the left side of the tube are major workers and adult

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FIG. 1.—The inverted U-shaped tube (A) 1.2 m high is made of Plexiglas® plastic tubing (5 cm diam). Attached to 1 end of the tube is a shaded-pole blower (B) driven by a 1/25 hp motor (C) capable of 5000 rpm. The other end of the tube is inserted into a 30.5-cm³ plastic box (D) with a wall thickness of 6.4 mm; a hinged lid is situated in the front of the box to allow access to the separated ants. The blower (B) is mounted on a board with adjustable bolts so it can be aligned. Plastic tube (E) connects the box with the inlet opening of the blower to make a completely enclosed circulating air system. A 10-amp rheostat (F) is wired between the power line and the motor to regulate the blower speed between 0 and 5000 rpm. The left side of the inverted U tube has an insert (G) 13.4 cm high situated just above the blower outlet that can be removed by lifting a plastic collar. Carbon dioxide (CO₂) is piped into the system at the top of the box (H).



males and females. Subsequently, by careful adjustment of the rheostat, these latter forms can also be separated one from the other. The major workers are separated first, followed by the males and females. Also, if brood is present in the sample, it can be separated from the adult ants; however, this separation is not so complete as with adult ants.

Little or no mortality was observed when this technique was used.

REFERENCE CITED

- Bailey, D. L., G. C. LaBrecque, and T. L. Whitfield. 1970. A forced-air column for sex separation of adult house flies. *J. Econ. Entomol.* 63: 1451-4.

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