Researchers develop new device to collect bed bugs

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Adult bed bug, *Cimex lectularius*. Credit: Public domain.

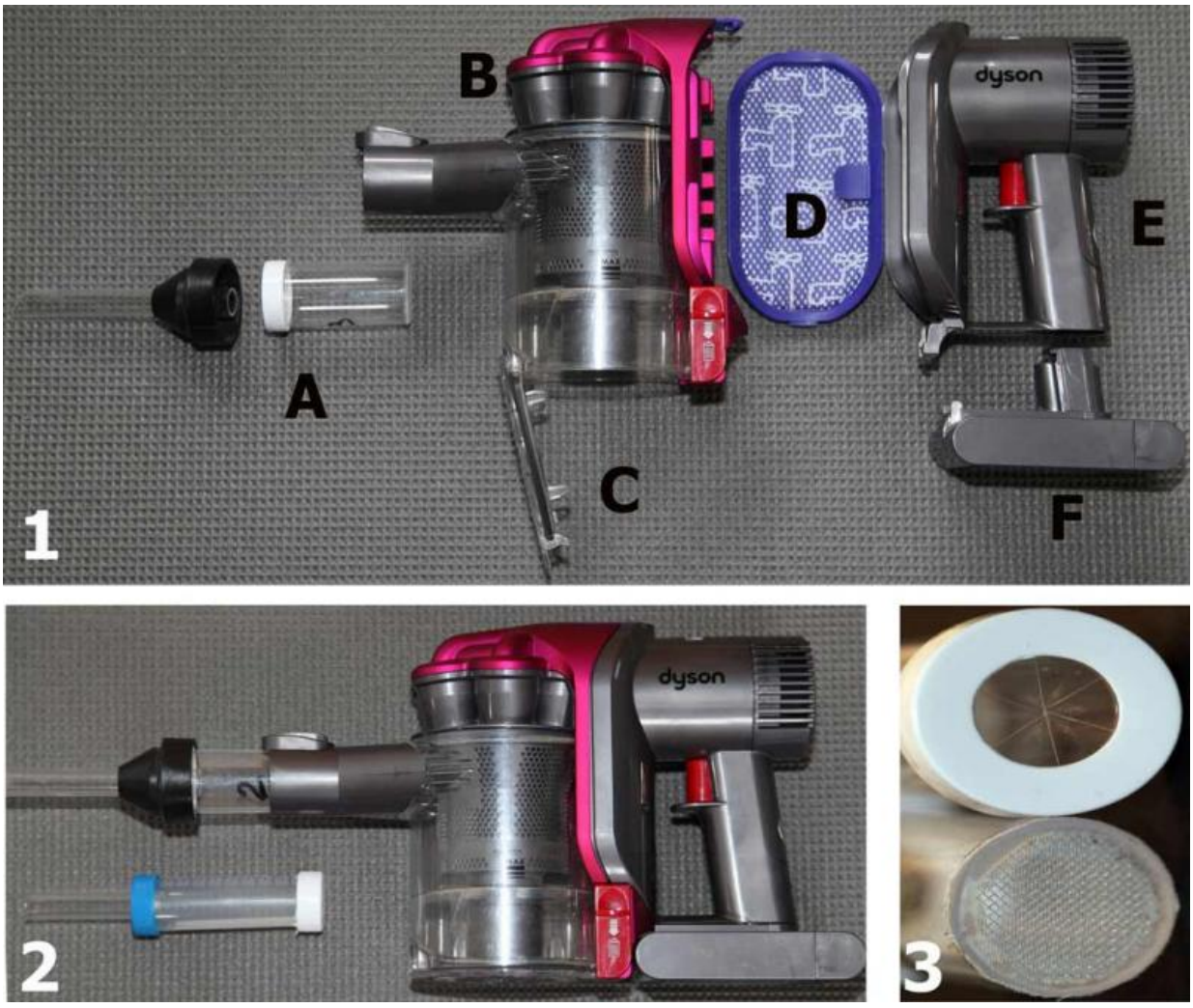
In recent years, bed bugs (*Cimex lectularius*) have been appearing more and more often in beds around the world, and entomologists need specimens for research purposes.

Scientists in France have developed a tool that will aid this research, and their device is described in an article called "A High-Performance Vacuum Cleaner for Bed Bug Sampling: A Useful Tool for Medical Entomology" that was published in the *Journal of Medical Entomology*.

"The need for bed bug amelioration requires increased bed bug monitoring and control," they wrote. "To increase monitoring and control levels, laboratory research on this pest insect is required for the development of innovative strategies and tools to eliminate bed bug infestations. Prior to developing laboratory experimental protocols to control bed bugs, field collection of this insect is necessary."

With the goal of collecting bed bugs to be used in laboratory research, they modified a Dyson hand vacuum (model DC34) with a sampling vial and a nozzle and created a device that proved to be effective at collecting bed bugs. In a bed bug-infested apartment where the device was tested, it collected more than 700 bed bugs in under 15 minutes, including adults, larvae, and eggs.

Typically, researchers have collected bed bugs with an aspirator, which is sort of like a mouth-powered vacuum, or they have used actual high-powered vacuum cleaners. However, the mouth method often isn't powerful enough to suck up bugs or eggs that are hidden in crevices or attached to mattresses, and it could potentially expose collectors to diseases. And the high-powered vacuum method often damages the insects, making them difficult to study.



The modified Dyson DC34 vacuum cleaner for bed bug collection: (1) A detailed view of the parts; (A) BioQuip sampling vial; (B) plastic jar; (C) trapdoor; (D) filter; (E) digital motor; (F) battery; (2) A view of the vacuum ready to be used for bed bug collection. A BioQuip sampling vial is set, and a home-made plastic vial is presented below. (3) A detailed view of the BioQuip sampling vial apertures with front and back views. Credit: Entomological Society of America

Enter the modified Dyson contraption. During the field test, it was powerful enough to collect the bugs, but gentle enough to not damage

them. Furthermore, it was light and easy to clean.

The researchers are optimistic that this new contraption will be able to safely and effectively collect bed bugs in the field to be used in laboratory research. However, they aren't limiting its uses to only bed bug collecting.

"The modified vacuum has other uses besides collecting bed bugs," said Dr. Jean-Michel Bérenger, one of the authors. "We have already tested it on lice, and we will also test it for fleas. It's not adapted for fragile insects such as mosquitoes, as it's too powerful, but I think it will be used for crop pest collecting or by entomologists using mouth aspirators (pooters) in the field, like coleopterists collecting under loose bark or in caves where there is often a risk of contamination, with histoplasmosis for example."

More information: *Journal of Medical Entomology*, jme.oxfordjournals.org/content … 015/03/18/jme.tjv019

Provided by Entomological Society of America