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**Bed bug aggregations exposed**

Group living provides certain benefits to bed bugs

Bed bugs like each other's company, that much we know. You usually find them clustered together in groups or aggregations, most often in narrow crevices such as in bed frames, or behind baseboards or headboards. Recently, two different research projects have provided us with more information on how and why bed bugs aggregate together.

Group living seems to provide certain benefits to bed bugs including an environment with higher humidity and temperature. In a group, it's easier to find mates, and a group provides some safety from predators. Group living for other insects, like cockroaches, has been shown to result in faster development, too. North Carolina State University researchers, headed by Virna Saenz, studies the effects of grouping versus isolation on the development rate of bed bug nymphs. They found that nymphs in an aggregation developed in an average of 27.5 days which is 2.2 days faster than nymphs that grew up alone. Nymphs developed just as quickly when the aggregation was all nymphs with no adults present. This suggests that eggs can hatch into nymphs and found new infestations without any adults. Nymphs that develop faster can reproduce and produce eggs faster, a benefit for the bed bug population as a whole. Nymphs that develop alone, however, would actually benefit from reaching adulthood more slowly since they need to wait for the arrival of at least one other bed bug in order to reproduce.

Dr. Richard Naylor of the University of Sheffield, England, wondered whether there is an upper limit to the size of a bed bug aggregation. If you add more bed bugs, do the existing aggregations



different feeding and mating status. But aggregations seem to be fairly consistent in size- about 20-40 bed bugs in each.

- When bed bug populations are small, the aggregations are in crevices close to the host (near the bed). As populations increase, aggregations are found further from the host. This tells us that bed bugs prefer to hide near the host rather than further away. It's good to be close to your food.
- Bed bugs tend not to disperse to aggregation sites away from the host until forced to do so by lack of available crevice space near the host. In the study, when the amount of available crevices near the host was doubled, bed bug dispersal away from the host was delayed. Why move when conditions are good?
- Bed bugs are not loyal to any particular aggregation. They don't return to a "home" aggregation after exploring or feeding. They move between aggregations. It seems any old crevice will do as long as there are others already there.

**You can control where bed bugs aggregate**



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just get bigger as they welcome the newcomers, or do new aggregations form? Naylor studied his bed bugs in (3m) long arenas in his laboratory. Ten unfed adult bed bugs were released into the arenas each day and the location of each bug noted. These are the findings:

- As bed bug populations increase, they tend to break up into many smaller aggregations rather than forming a few large aggregations. This behaviour may be driven by female bed bugs as a way to avoid large groupings of males and the resulting traumatic insemination of mating.
- Aggregations are composed of individuals of different sexes, life stages (including eggs), and of

The fewer the number of bed bug hiding places (crevices), the easier bed bugs are to control. We love to find uncluttered environments, especially around the bed. Control can be improved when caulks and sealants are used to eliminate crevices around the bed, and encasements are used to eliminate hiding places in and on the bed. However, eliminating bed bug hiding places without also eliminating the bed bugs contributes to bed bug dispersal and control becomes more difficult. In other words, if bed bugs are blocked from hiding near the host, they will move to the next closest cracks and crevices elsewhere in the room, making them harder to find. And if blocked from most of the crevices in a room, they will disperse even further, into the next room or even the next apartment.

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