

"Long before it's in the papers"

[RETURN TO THE WORLD SCIENCE HOME PAGE](#)

Tiny bugs have own personalities despite being clones, scientists say

March 3, 2011
Special to World Science

Tiny green insects known as pea aphids have individual behavior patterns, or “personalities,” despite being clones of one another, scientists say. The researchers found differences in the way each individual responds to a threat.

The study was part of a “burgeoning” of scientific interest in animal personality variation, noted the investigators, with the University of Osnabrueck, Germany. But despite this trend, they added, few studies have been done on invertebrates, or simple animals without backbones.



The pea aphid, *Acyrtosiphon pisum*, sucks nectar from a plant. (Image courtesy Tsutomu Tsuchida)

Studies on “clonal invertebrates,” which are all genetically identical and would thus be expected to show limited differences in behavior, are “nonexistent,” they added, reporting their findings in the March 1 online issue of the journal *Developmental Psychobiology*.

“This is surprising given the obvious advantages of using invertebrates/clones to tackle the crucial question why such consistent behavioral differences exist,” they went on. Personality differences not attributable to genes are generally presumed to be due to the environment in which an organism formed, though there is also a

growing appreciation of epigenetic factors—chemical differences that are not genetic, but that influence gene activity.

Pea aphids, scientifically named *Acyrtosiphon pisum*, are pale little insects typically less than a sixth of an inch (half a centimeter) long that feed on pea plants and their relatives. A cluster of aphids infesting a given plant is typically a genetically identical, or clonal, group produced by one mother without sex, although aphids can also reproduce sexually at certain phases.

When a pea aphid is threatened by a predator—of which the species has several including wasps and grubs—it gives off a chemical alarm signal that alerts nearby aphids. They may respond in several ways: they can walk away, drop off the plant or seemingly ignore the signal. The researchers, Wiebke Schuett and colleagues, found that pea aphids can be divided into one of three categories: consistent “droppers,” consistent “non-droppers,” and some that behave unpredictably.

In experiments, “manipulations of early environmental conditions had little qualitative impact on such patterns,” the researchers wrote. Although the reasons for the differences are unclear, the findings may be important for future studies of personality variation and its evolutionary and ecological consequences, they added.

Researchers seek to understand how animals develop different “personalities” in part because they want to understand how humans do so. Animals are used as model organisms because they are often simpler and easier to experiment on. For instance, animals may be bred differently to examine resulting differences in behavior, and the early life environment of a test animal can be controlled and examined.

Studies have found that 20 to 50 percent of the variation in animal personality traits is genetic, according to researchers with the Netherlands Institute of Ecology and the Max Planck Institute for Ornithology in Germany, who reviewed the subject for the December issue of the journal *Philosophical Transactions of the Royal Society B*.

“Development and learning” dominate the rest of this variation, they added. But “one of the main questions that still remains unresolved is why variation in personality exists and how this is maintained... Molecular genetic research on animal personality is still in its infancy.”