

September 17, 2010

Idaho Giants among lacewings prowl the Palouse

Written by Bill Loftus

MOSCOW, Idaho – Peter Duelli, a retired professor and biodiversity specialist at the Swiss Federal Research Institute WSL in Zurich, welcomed the rare appearance of a giant lacewing during his visit this week to the University of Idaho College of Agricultural and Life Sciences Tuesday.

After a lifetime spent studying lacewings in the laboratory and around the world, he'd never seen a live specimen.

Duelli visited the Moscow campus as the guest of James "Ding" Johnson, Department of Plant, Soils and Entomological Sciences Department head. The two returned to Moscow after a two-week trip to southern California and the Southwest to collect lacewings.

Duelli, Johnson and Frank Merickel, collection manager of William F. Barr Entomological Museum and its 1 million specimens on the Idaho campus, gathered to share notes on the rare insect.

The giant lacewing is an enigma, even to professional entomologists who have spent careers studying the order Neuroptera, which includes some 5000 species of lacewings. Rare now, the giant lacewing once clouded around the bright lights of a factory at night so thickly that passersby reported smoke was pouring from the building.

Northern Idaho may be one of the giant lacewing's strongholds these days. And so it was that three entomologists, all with more than a passing interest in lacewings in general, welcomed the appearance of a captive female.

Most people with at least a nodding acquaintance with beneficial insects, organic gardening or similar topics know the green lacewing. Prized because it preys on pests like aphids, the green lacewing is grown commercially in Japan, Russia, China, Brazil and elsewhere to protect vegetable and floral crops produced organically.

The floral industry buys green lacewings to liberate in greenhouses to control pests that would otherwise require pesticide applications.

Merickel may rank as the scientist most familiar with the giant lacewing, which can measure nearly two inches long compared to its more common relative the 1/2-inch long green lacewing. Although Merickel may collect 30 to 40 of the insects a year as part of his 18-year fascination with the species, neither he, nor Johnson or anyone else knows how they live.

"They were first described over 200 years ago," Johnson said, "and we still don't know where the larvae live or what they live on."

The mystery probably means the giant lacewing, known to science as *Polystoechotes punctatus*, lives in the soil, because soil is so hard to sample for immature insects there.

Also weird, Merickel said, is that such an uncommon insect can suddenly, under the right conditions, appear by the hundreds in one spot. He believes adults may converge in pursuit of smoke, looking for burned areas to lay their eggs. The aggregating flights, the massive swarms so thick they look like billowing smoke, do not appear to be mating flights, however.

The green lacewing, perhaps because of its commercial importance or simply its abundance and global distribution, is better understood. Only recently, however, did insect experts begin to understand the complexity of its life history.

Long known scientifically as *Chrysopa carnea*, the common green lacewing was moved to the genus *Chrysoperla* and actually represents dozens of individual species that are all virtually identical physically. What separates the group into dozens of separate species is their mating song, which both the male and the female must perform correctly for life to go on. Entomologist Charles Henry at the University of Connecticut discovered the songs and their importance.

And that is part of what drew him to the study of lacewings, Duelli said. The idea of how evolution has shaped a very old order of insects in ways that allowed it to survive, and the mysteries it still poses continues to fascinate him.

While in southern California, Johnson and Duelli focused on finding a lacewing that looks a lot like the green lacewing but greener, emerald to be exact. "We've been working on this for 30 years." Another international lacewing expert is Steve Brooks at the British Museum of Natural History. The project involves larval and adult morphology, courtship songs, plus ecological and physiological studies to identify and describe the species.

The physical similarities of so many unique green lacewings makes the species probably the best known to science among the order. But that doesn't make them simple, either. Once scientists learned to separate them by their mating songs, actually abdominal vibration that is transmitted by the insect's legs to the leaf and detected by nerves in the feet of a potential partner. That knowledge helped Duelli find a new species in his garden. Johnson found another in Moscow.