Humble bug plugs gap in fossil record

August 1 2012

A view of the Galerie de Evolution (Evolution Gallery) of the Museum National d'Histoire Naturelle in Paris. One day 370 million years ago, a tiny larva came to a sticky end when it plunged into a shrimp-infested swamp and drowned. Unearthed in modern-day Belgium, the humble bug now looks set to plug a giant gap in the fossil record.

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Named Strudiella devonica, the eight-millimetre invertebrate -- while in far from mint condition -- is thought by researchers who published their findings in *Nature* on Wednesday to be the world's oldest complete insect fossil.

"It has everything an insect should have: the legs, the antennae, the thorax and the abdomen," said Andre Nel of France's National History Museum, one of the authors of the study.

Scientists until now had few if any confirmed insect fossils from between 385 and 325 million years ago, a period known as the Hexapoda Gap, William A. Shear of Hampden-Sydney College wrote in a comment that accompanied the study.

Strudiella devonica could significantly narrow that gap in the fossil record.

Based on molecular DNA studies, Nel says scientists had long expected to find insect life dating that far back, but the fossil find yields insight into the evolutionary roots of the insect kingdom.

"Insects are an extremely ancient group, but we know very little about the earliest among them," he explained to AFP. "This find enables us to confirm our molecular dating, it's a palaeontological marker."

Nel said science "had a grand total of two fossilised mandibles from Scotland to account for the whole Devonian" -- the geological period running from around 415 million to 360 million years ago.

From these isolated fossil fragments, some 400 million years old, fast-forward to a period known as the Carboniferous, 300 to 330 million years ago, and the fossil record teems with insects.

"In between this profusion of creatures of all kinds -- cockroaches, dragonflies, grasshoppers -- and the earliest specimens, we have nothing," Nel explained.

"Yet it was precisely at this time that these animals started to diversify,

even started to appear since their ancestors were aquatic insects," he said.

With its six-legged thorax, long single-branched antennae, triangular jaws and 10-segmented abdomen, tiny Strudiella devonica is a strong contender for an insect ID card, Shear argues.

But he also urges a degree of caution, stressing the study is based on interpretation of a single fossil in relatively poor condition.

"What would make it more certain? A better preserved specimen, especially one that showed more clearly the appendages and mouthparts," he told AFP.

While the specimen itself does not have wings, the researchers believe that based on the shape of its mandibles -- similar to those of a modern-day grasshopper -- it is probably the larva of a winged animal.

If correct, that would also mean that winged insects originated much earlier than available fossils have suggested, Shear said.

The fossil was found in a rock slab in a quarry in Belgium, in a strata of very fine, slightly sandy clay -- "probably a land animal that landed in a pond teeming with carnivorous shrimps, and that miraculously escaped being devoured by them," Nel said.