

Thème 1 – La Terre dans l'Univers, la vie, l'évolution du vivant

1-A – Génétique et évolution

Evolution in action: mosquitoes in the Tube.

One of the most frequent science-denialist arguments against evolution is the claim that the evolution of a new species has never been observed.

Using information from the documents, try to give a definition of a species and show that the assertion is false.

**Document 1:**

Genetic variation was quantified between surface-dwelling populations of *Culex pipiens* and the so-called *molestus* form found in the London Underground railway system. The *molestus* form is a commercially important biting nuisance and in the southern part of its range is also a disease vector. From: *science daily*.



**Document 2:** 24 May 1862: the Chancellor of the Exchequer, William Ewart Gladstone, and directors and engineers of the Metropolitan Railway Company, embark on an inspection tour of the world's first underground line. From: <http://www.telegraph.co.uk>



**Document 3:** Extract from *London Times*, August 26 1998.

A NEW species of mosquito is evolving on the London Underground in a development that has astonished scientists.

The insects are believed to be the descendants of mosquitoes which colonised the tunnels a hundred years ago when the Tube was being dug. When they went below ground they were bird-biting pests. But over a century, deprived of their normal diet, the mosquitoes have evolved new feeding behaviour, dining on mammals including rats and mice - and human beings. They now plague maintenance workers.

Kate Byne and Richard Nichols of Queen Mary and Westfield College in London have carried out tests to see if the Tube's mosquitoes, which have been named *molestus*, are now different from *Culex pipiens*, the bird-biting species which entered the Underground last century. To their amazement they found that it was almost impossible to mate those living above ground with those in the subterranean world, indicating that the genetic differences are now so great that the ones underground are well on their way to becoming a separate species. This usually happens only when species are isolated for thousands rather than tens of years.

The team, whose findings are reported in BBC Wildlife magazine today, have also found genetic differences between mosquitoes on different Tube lines. They believe this is due to the draughts dispersing the insects along but not between lines.

During the Second World War the insects attacked Londoners sheltering from Hitler's bombs. Roz Kidman Cox, the magazine editor, said: "It's a remarkable story of evolution. The scientists say that the differences between the above and below-ground forms are as great as if the species had been separated for thousands of years."

The conditions on the Underground are probably ideal for mosquitoes to breed rapidly and frequently throughout the year. Temperatures can be balmy and the network is prone to penetration by water creating pools of stagnant water for breeding.