

## Earliest confirmed TB case found

**The 9,000-year-old remains of a mother and her baby discovered off the coast of Israel provide the earliest concrete evidence of human TB, say researchers.**

The bones were excavated from Alit-Yam, an ancient Neolithic village near Haifa, which has been submerged in the Mediterranean for thousands of years.

The experts from University College London and Tel-Aviv University used DNA technology to confirm the bacterium.

Others have found remains that hint at TB dating from about 500,000 years ago.

However, there is no firm proof that the tell tale signs seen in the skeleton of a young man believed to belong to the first human species to migrate out of Africa - Homo erectus - were in fact caused by TB. Some experts doubt it.

### Watery grave

The Israel bones, discovered by Dr Helen Donoghue and Dr Mark Spigelman, prove the disease is at least 3,000 years older than previously confirmed in other remains found in Italy. The watery grave provided the ideal environment to preserve the skeleton and its DNA.

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Dr Donoghue

The Atlit-Yam site was located within marshland, the graves were encased in clay, eventually covered by thick layer of sand and later by salt water, protecting the bones from decay.

The size of the infant's bones, and the extent of TB damage, suggest the mother passed the disease to her baby shortly after birth.

They lived around the time of the first great transition of man from hunter-gatherers to a settled agriculture-based lifestyle.

One theory is that TB originally spread from cattle to humans.

But these latest findings, published in PLoS One journal, suggest human TB predates bovine TB.

Dr Donoghue said: "What is fascinating is that the infecting organism is definitely the human strain of tuberculosis, in contrast to the original theory that human TB evolved from bovine TB after animal domestication.

"This gives us the best evidence yet that in a community with domesticated animals but before dairying, the infecting strain was actually the human pathogen.

"The presence of large numbers of animal bones shows that animals were an important food source, and this probably led to an increase in the human population that helped the TB to be maintained and spread."

The scientists were also able to show that the DNA of the strain of TB in the skeletons had lost a particular piece of DNA which is characteristic of a common family of strains present in the world today.

"The fact that this deletion had occurred 9,000 years ago gives us a much better idea of the rate of change of the bacterium over time, and indicates an extremely long association with humans," said Dr Donoghue.

Dr Simon Mays, skeletal biologist at English Heritage's Centre for Archaeology, said: "This does

predate the other earliest convincing cases of TB from Italy by about 6,000 years.

"It tells us that the human form of TB is quite ancient."

Ultimately, Dr Donoghue's team hope their work will help others find more effective treatments for TB.

About nine million new cases of TB, and nearly two million deaths from TB, are estimated to occur around the world every year.

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