The path to history is through the stomach

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Two different forms of the stomach bacterium Helicobacter pylori show that the human settlement of Australia and the Pacific island was undertaken from different routes. Image: Max Planck Institute for Infection Biology/Achtman

(PhysOrg.com) -- Helicobacter pylori can cause stomach ulcers and cancers. Over half of the world's inhabitants carrys this bacterium, but different variants are present on different continents. Up to now, biologists have differentiated between five populations of these bacteria. Researchers at the Max Planck Institute for Infection Biology in Berlin and at the University of Cork in Ireland have now discovered a new population of Helicobacter pylori bacteria that attests to the shared origin of the earliest inhabitants of Australia and New Guinea. (*Science*, January 23rd, 2009)

Mark Achtman and his international team of researchers have confirmed and supplemented studies carried out by archaeologists, linguists and human geneticists with the help of the stomach bacterium Helicobacter pylori (Hp). The Pacific region was settled by migrants in two waves. The oldest ancestors of modern man lived in Australia and New Guinea as far back as 31,000 to 37,000 years ago.

They ended up there as a result of migrations from Asia, which were accompanied by the Hp population hpSahul. The scientists discovered this population among the original inhabitants of Australia and the Highlands of New Guinea, both of whom probably migrated from Asia to Sahul during the last Ice Age. At that time, Australia, New Guinea and Tasmania were merged within the continent called Sahul. hspMaori, a subpopulation of hpEastAsia, accompanied a second and much later migration in the Pacific region. The prevalence of hspMaori in the stomach of most of the original inhabitants of Taiwan, Melanesia and Polynesia confirms that humans migrated from Taiwan via Melanesia to Polynesia.

Mark Achtman has been working on Hp since 1998. Jared Diamond's book "Guns, Germs and Steel", which describes the development of the populations of Europe and Asia, prompted him to trace the migration of peoples with the help of the stomach bacterium. The current study builds on the results obtained by the scientists in earlier research. "It is now known that Helicobacter pylori varies regionally", explains Achtman. "Around ten years ago, we discovered that the bacteria in Europe differ from those in China. In 2003 we succeeded in demonstrating that one population of these bacterium was introduced to North America during the slave trade." When Achtman finally found distinguishableHp among Muslims and Buddhists in Northern India in 2004, he realised that details of human migrations can be elucidated on the basis of these bacteria.

The samples, on which the current tests are based, originated from a

range of sources. In some countries, the scientists obtained them directly from doctors and hospitals. In other countries, the doctors put them in contact with original inhabitants who were willing to participate in the study, including highlanders from New Guinea and Australian aboriginals living in the middle of the Australian desert. The Japanese scientist Yoshio Yamaoka provided the bacteria from Taiwan. Barry Marshall, a 2005 Nobel Laureate, and Helen Windsor supported the study by providing stomach microbes from Australia.

"It is astonishing that hpSahul and hspMaori do not exist side-by-side in any of the samples", explains Achtman. He had never experienced this before in any of his studies. There are three possible explanations for this: Either the different original inhabitants had little contact with each other; one bacterial population is fitter than the other and suppresses it; or an area exists that has not yet been studied, in which hpSahul and hspMaori coexist. "The Pacific archipelago is so big that it was not possible to include all of the islands in our study", explains Achtman. The researcher, who now works at University College Cork, would like to examine further Pacific islands to be able to provide a more comprehensive response to this question.

Article: Y. Moodley, B. Linz, Y. Yamaoka, H. Windsor, S. Breurec, J.-Y. Wu, A. Maady, S. Bernhöft, J.-M. Thiberge, S. Phuanukoonnon, G. Jobb, P. Siba, D. Y. Graham, B. Marshall, and M. Achtman, The peopling of the Pacific from a bacterial perspective, *Science*, January 23rd, 2009

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