

New study suggests Columbus brought syphilis to Europe from New World

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Did Columbus and his men introduce the syphilis pathogen into Renaissance Europe after contracting it during their voyage to the New World? Or does syphilis have a much longer history in the Old World? The most comprehensive comparative genetic analysis conducted on the family of bacteria (the treponemes) that cause syphilis and related diseases such as yaws, published Tuesday, January 15 in *PLoS Neglected Tropical Diseases*, supports the so-called “Columbian theory” of syphilis’s origins.

Kristin Harper (Emory University, Atlanta, USA) approached this centuries-old debate by using phylogenetics — the study of the evolutionary relatedness between organisms — to study 26 geographically disparate strains of treponemes. The venereal syphilis-causing strains originated most recently, and their closest relatives were strains collected in South America that cause the treponemal disease yaws.

“That supports the hypothesis that syphilis — or some progenitor — came from the New World,” Harper says.

While it is generally agreed that the first recorded epidemic of syphilis occurred in Europe in 1495, controversy has raged ever since over the origin of the pathogen.

Most of the evidence in recent years has come from bones of past civilizations in both New World and Old World sites, since chronic syphilis causes skeletal lesions. In many cases, however, skeletal analysis

is inconclusive, due to problems with pinpointing the age of the bones and the lack of supporting epidemiological evidence.

Further complicating the research is the fact that the family of *Treponema* bacteria causes different diseases that share some symptoms but have different modes of transmission. Syphilis is sexually transmitted, but yaws and endemic syphilis are tropical diseases that are transmitted through skin-to-skin or oral contact. One hypothesis is that a subspecies of *Treponema* from the warm, moist climate of the tropical New World mutated into the venereal, syphilis-causing subspecies to survive in the cooler and relatively more hygienic European environment.

The phylogenetic analysis indicated that yaws is an ancient infection in humans while venereal syphilis arose relatively recently. The study results are especially significant due to the large number of different strains analyzed, including two never-before-sequenced strains of yaws from isolated inhabitants of Guyana's interior. At Harper's request, the Guyana samples were collected during a medical mission by Ve'ahavta, the Canadian Jewish Humanitarian and Relief Committee.

“Syphilis was a major killer in Europe during the Renaissance,” says co-author George Armelagos, a skeletal biologist whose research put him at the forefront of the syphilis debate 30 years ago. “Understanding its evolution is important not just for biology, but for understanding social and political history. It could be argued that syphilis is one of the important early examples of globalization and disease, and globalization remains an important factor in emerging diseases.”

Citation: Harper KN, Ocampo PS, Steiner BM, George RW, Silverman MS, et al. (2008) On the Origin of the Treponematoses: A Phylogenetic Approach. *PLoS Negl Trop Dis* 2(1): e148.
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