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ARTICLE

Genome-wide SNP data of Izumo and Makurazaki populations support inner-dual structure model for origin of Yamato people

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Abstract

The "Dual Structure" model on the formation of the modern Japanese population assumes that the indigenous hunter-gathering population (symbolized as Jomon people) admixed with rice-farming population (symbolized as Yayoi people) who migrated from the Asian continent after the Yayoi period started. The Jomon component remained high both in Ainu and Okinawa people who mainly reside in northern and southern Japan, respectively, while the Yayoi component is higher in the mainland Japanese (Yamato people). The model has been well supported by genetic data, but the Yamato population was mostly represented by people from Tokyo area. We generated new genome-wide SNP data using Japonica Array for 45 individuals in Izumo City of Shimane Prefecture and for 72 individuals in Makurazaki City of Kagoshima Prefecture in Southern Kyushu, and compared these data with those of other human populations in East Asia, including BioBank Japan data. Using principal component analysis, phylogenetic network, and f4 tests, we found that Izumo, Makurazaki, and Tohoku populations are slightly differentiated from Kanto (including Tokyo), Tokai, and Kinki regions. These results suggest the substructure within Mainland Japanese maybe caused by multiple migration events from the Asian continent following the Jomon period, and we propose a modified version of "Dual Structure" model called the "Inner-Dual Structure" model.

Introduction

The Japanese Archipelago spans more than 2000 km from north to south. This Archipelago was called "Yaponesia" by writer Toshio Shimao in early 1960s [1], by connecting "Yapo" (Japan in Latin) and "nesia" (islands in Latin). Yaponesia can be divided into three geographical areas: Northern Yaponesia, Central Yaponesia, and Southern

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