Genetic studies on prehistoric translocations of chickens in the Indo-Pacific

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Thesis Abstract

The study conducted in this thesis examines the genetic population history of chickens in the Indo-Pacific region in order to infer the prehistoric human-mediated translocation of chickens and investigate whether the dispersal history of chickens in this region parallels the Austronesian expansion. The research focuses on chicken populations found in Island Southeast Asia, Pacific Ocean, and Indian Ocean – regions where Austronesian languages are spoken. The islands and archipelagos found in this region are separated by vast distances of ocean, thus the dispersal of chickens within this region is mediated only through human agency. The geographic distribution of genetic variation in chickens of this region is due only to humans translocating chickens during their voyages, thus this genetic information can be utilised to examine the expansion of the Austronesian-speaking people.

A genetic survey that spans two oceans is challenging, thus the study relied mostly on modern chicken DNA and available ancient DNA to reconstruct events that transpired several millennia ago. The use of modern DNA allowed comparison with reference sequences from across the globe, whereas ancient DNA allowed population continuity to be tested – *i.e.*, whether the modern specimen still represents past populations. The phylogeographic and population genetic analyses on these chickens provided unparalleled insights into the prehistoric translocation history of chickens in the Indo-Pacific region. These have allowed us to confirm the Philippine homeland of the Polynesian chickens and find the east African proximate population source for chickens in Madagascar. Furthermore, the study supports that chickens were dispersed into the Pacific along with the Austronesian expansion, but not in the Indian Ocean. The study also revealed original insights and highlights the complex

picture about the population history and human-mediated dispersals of chickens in the Indo-Pacific. This complexity is brought by the fact that the prehistoric translocation of chickens cannot be solely attributed to one dominant human group or expansion event that occurred in the region. Therefore, it is paramount to use archaeological and linguistic narratives to explain the genetics of chickens and reach the best inference possible about their history.

This research demonstrates the usefulness of using genetic studies on chickens in elucidating the origins and routes of prehistoric translocations and Austronesian expansion in the Indo-Pacific. This study advances our knowledge about prehistoric dispersal of chickens in the Indo-Pacific region and will precipitate exciting new avenues of research.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work, in the future, be used in a submission of any other degree or diploma in any university or other tertiary institution without prior approval of the University of Adelaide and where applicable, any partner institution responsible for the join-award of this degree.

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