

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



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Table of Contents

Contents

Table of Contents	iii
Thesis Abstract.....	vii
Declaration.....	ix
Acknowledgements.....	x
List of Tables	xii
List of Figures	xii
CHAPTER 1: General introduction	1
Introduction.....	2
Background to the Austronesian expansion.....	3
The genetic landscape of the Austronesian dispersal.....	5
The advent of agriculture in Island Southeast Asia & the Pacific	7
The animal domesticates in ISEA and the Pacific	9
The Pig.....	11
The Dog	13
The domestication and translocation history chickens.....	14
Tracking the translocation of chickens using genetics.....	19
General aims of the thesis	22
Thesis outline	23
References.....	26
CHAPTER 2: Island Southeast Asian origin and the dispersal of Polynesian chickens indicated by mitochondrial DNA	35
Abstract.....	40
Keywords	41
Introduction.....	41
Materials and methods	44
Sampling	44
PCR amplification and sequencing	46
Phylogeny and phylogeography	47
Population variability and structure	47
Bayesian coalescent simulation	48
Results.....	50
Classification of chicken mtDNA control region sequences and haplogroup distribution	50

Population structure.....	53
Distribution and diversity of haplogroup D.....	56
Phylogenetic relationship of D haplotypes from ISEA and the Pacific.....	59
Population dynamics of chickens in ISEA and the Pacific	60
Expansion history testing using BayeSSC	62
Discussion	62
Conclusion.....	65
Acknowledgement.....	66
References	67
Supplementary information.....	70
CHAPTER 3: East African origins for Malagasy chickens as indicated by mitochondrial DNA	75
Abstract	80
Keywords	81
Introduction	81
Materials and Methods	84
Results	86
Mitochondrial haplogroup distribution patterns	86
Population genetic structure	87
Population genetic variability and dynamics.....	89
Phylogenetic relationships of Madagascan mtDNA haplotypes in East Africa, South Asia and Indonesia	91
Discussion	93
Conclusion.....	95
Acknowledgement.....	96
References	97
Supplementary information.....	100
CHAPTER 4: Mitochondrial DNA genomes resolve the genetic origins of Polynesian chickens.....	105
Abstract	110
Keywords	111
Introduction	111
Materials and methods.....	114
Sample collection, DNA extraction, library preparation, hybridisation-enrichment and sequencing.....	114
Network analysis & phylogenetic construction.....	118

Population genetic statistics and structure	119
Results.....	119
Sequence and phylogenetic network of <i>Gallus gallus</i>	119
Haplogroup D in the Asia-Pacific.....	122
Phylogenetic reconstructions of haplogroup D mitochondrial genomes	124
Comparisons between evolutionary inferences based on WMG and mtDNA-CR	126
Discussion.....	128
Conclusion	131
Acknowledgement	131
References.....	132
Supplementary information	134
CHAPTER 5: Exploring the population history of chickens in the Asia-Pacific using genome-wide single nucleotide polymorphism	139
Abstract.....	144
Keywords	145
Introduction.....	145
Materials and methods	149
Samples and SNP genotyping array.....	149
Detection of loci under selection & population structure analysis.....	151
Results.....	152
Phylogenetic inference.....	152
Outlier loci detection & neutral population structure	154
Discussion.....	158
Conclusion	161
Acknowledgment	161
References.....	162
Supplementary information	166
CHAPTER 6: Concluding discussion.....	169
Aim 1: Genetic characterisation of Indo-Pacific chickens.....	172
Aim 2: Reconstruct the Austronesian expansion using a proxy species	177
Aim 3: Assessing the resolution of human-mediated dispersal histories of chickens using control region, whole mitochondrial genome, and genome-wide SNP based histories ...	182
Concluding remarks	185
References.....	187

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 joint-award of this degree.

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Michael James Bannister Herrera

March 2015

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List of Tables

Table 2-1. Sampling locations, sample sizes, haplogroup and haplotype assignments for 6169 worldwide chicken samples.	52
Table 2-2. Population genetic structure estimated from the analysis of molecular variance (AMOVA) based on mtDNA	56
Table 2-3. Population genetic summary statistics for regional mtDNA haplogroup D sequences.	58
Table S2-1. Samples used in the study. (Excel File/ CD-ROM).	74
Table S2-2. Population genetic summary statistics for the study populations worldwide.	74
Table 3-1. Population genetic structure estimated from the analysis of molecular variance (AMOVA) based on mtDNA	89
Table 3-2. Population pairwise (F_{ST}) between chicken samples from Indonesia, South Asia, East Africa, and Madagascar	90
Table 3-3. Genetic diversity measures and historical demographic patterns of chickens from Indonesia, South Asia	91
Table S3-1. Samples used in the study. (Excel File/ CD-ROM)	103
Table S3-2. Genetic diversity measures for each chicken population from Indonesia, South Asia, Continental Africa	103
Table S4-1. Samples used in the study, reference number, description	135
Table S4-2. Sequencing library structure and PCR primers used for the construction of the sequencing libraries.	137
Table 5-1. List of chicken samples successfully genotyped	149

List of Figures

Figure 1-1. Map of Southeast Asia and the Pacific regions showing the demarcation between Near and Remote Oceania	2
Figure 1-2. Worldwide map showing the regions where agriculture approximately developed (Diamond & Bellwood 2000).	8
Figure 2-1. Sampling localities of modern and historical chickens collected in this study from Mainland Southeast Asia	45

Figure 2-2. Neighbour-joining tree showing the relationships between 5 27 mtDNA control region haplotypes (201bp) from 6169	51
Figure 2-3. Multidimensional scaling plots (MDS) on population pairwise F_{st} for (a) 6169 worldwide chicken samples	54-55
Figure 2-4: Frequency of mtDNA haplogroup D (green), D haplotypes containing the 4-SNP Polynesian motif (red), and other haplogroups	57
Figure 2-5. Median-joining network of 25 D haplotypes found in the Pacific including Polynesian haplotypes from	60
Figure 2-6. Mismatch distribution patterns for mtDNA control region haplogroup D samples from chickens sampled in the Philippines	61
Figure S2-1. Serial Coalescent Simulation and Approximate Bayesian Computation models for the reconstruction chicken translocation	70-71
Figure S2-2. Multidimensional scaling plots (MDS) on population pairwise F_{st} for (a) world-wide chicken samples from haplogroup E only	72-73
Figure 3-1. Frequency distribution of chicken mitochondrial DNA haplogroup (<i>blue</i> – haplogroup D, <i>white</i> – haplogroup E	87
Figure 3-2. Multidimensional scaling plots (MDS) on population pairwise F_{ST} scores for (A) 3115 chickens from Asia (<i>Orange</i>)	88
Figure 3-3A. Median-joining network depicting the relationship of D haplotypes of chickens from East Africa and Madagascar	92
Figure 3-3B. Median-joining (MJ) network of mtDNA-CR D haplotypes observed in Africa (<i>blue</i>), South Asia (<i>brown</i>), Indonesia	93
Figure S3-1. Principal Coordinate Analysis (PCoA) via covariance matrix of pairwise genetic distances of D haplotypes observed	100
Figure S3-2. Neighbour-joining tree of the 429 haplotypes generated by the 349 bp dataset used in the study. Haplogroup D and E	101
Figure S3-3. Median-joining network depicting the relationship of the E haplotypes observed in East Africa and Madagascar	102
Figure 4-1. Photographs of red jungle fowl (left) and green	111
Figure 4-2. Median-joining network of 120 chicken mitochondrial genomes (117 haplotypes). Colours represent 13 known haplogroups	121
Figure 4-3. Map of the Asia-Pacific region showing the geographic distribution of 120 whole mitochondrial genomes	121

Figure 4-4. Median-joining network of 64 haplogroup D mitochondrial genomes (62 haplotypes). Colours represent the geographic	122
Figure 4-5. PCoA based on the genetic distances of haplogroup D mitochondrial genomes of chickens from the Asia-Pacific	124
Figure 4-6. Maximum likelihood tree of 64 haplogroup D chicken mitochondrial genomes constructed using a GTR+G model	125
Figure 4-7. Phylogenetic networks of 120 chickens based on (a) whole mitochondrial genome, (b) control region, and (c) 201 bp	127
Figure S4-1: Examples of DNA map damage profiles for (A) ancient (ACAD 3896) and (B) museum (ACAD 14814) samples	134
Figure 5-1. Maximum likelihood tree of 51 chickens based on genome-wide SNPs constructed using MULTIGAMMA model	153
Figure 5-2. Examples of LOSITAN plots identifying outlier SNP loci, with blue dots representing SNPs.	154
Figure 5-3. Principal coordinate analysis performed using Eigensoft on genome-wide neutral SNPs of chickens from the	156
Figure 5-4. Principal coordinate analysis performed using Eigensoft on genome-wide neutral SNPs of chickens from the Philippines	157
Figure S5-1. Maximum likelihood tree of 51 chickens based on genome-wide SNPs constructed using MULTIGAMMA	166
Figure S5-2. Principal coordinate analysis performed using Eigensoft on genome-wide of the combined neutral and selected SNPs	167