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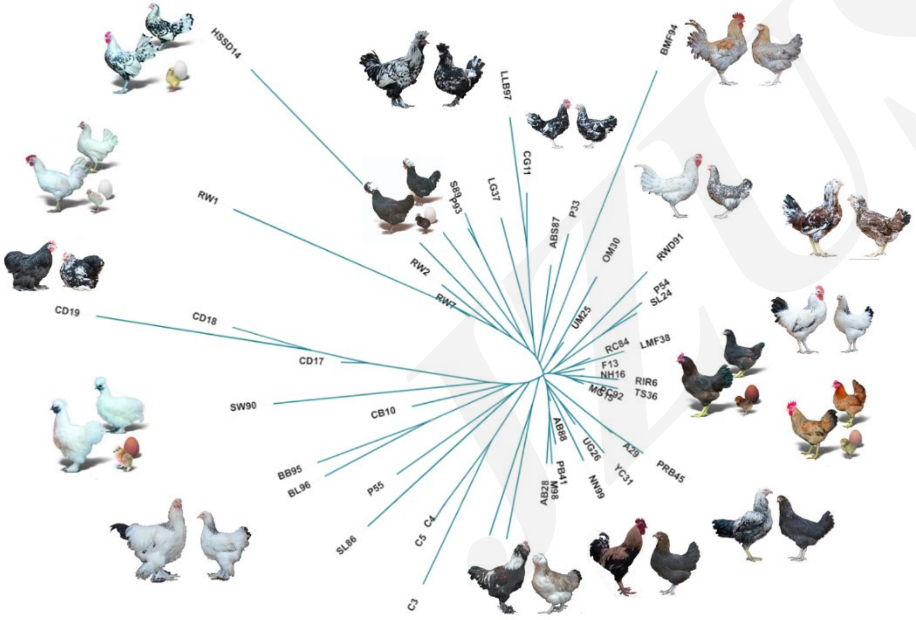
Large-scale genome-wide SNP analysis reveals the rugged (and ragged) landscape of global ancestry, phylogeny, and demographic history in chicken breeds

Key words: Chicken genome diversity; SNP analysis; Gene pool; Global ancestry; Phylogeny; Demographic history

Research Summary

This research aimed to perform a large-scale genome-wide analysis of the landscape of the complex molecular architecture, genetic variability and detailed structure among 49 populations.

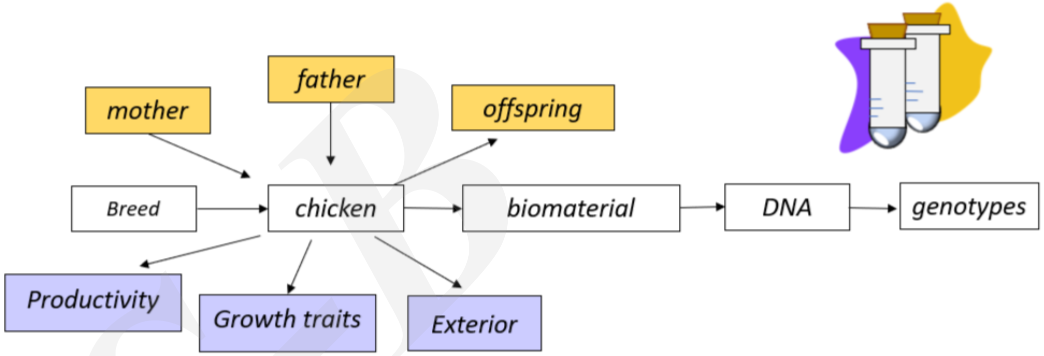


- ❑ **Genetic diversity and genetic variability in small chicken populations**
- ❑ **Effective population size**
- ❑ **ADMIXTURE analysis**
- ❑ **Overall 49-population phylogeny analysis**

Innovation points

● **Introduction** of the genetic diversity landscape assessment in poultry for:

- ❑ preserving genetic resources;
- ❑ performing the genetic identification of breeds;
- ❑ studying the history of their genetic divergence;
- ❑ improving the efficiency of breeding in farm animal populations



● **Summary** of large-scale genome-wide analysis of the landscape of the complex molecular architecture, genetic variability and detailed structure among 49 chicken populations

● **Emphasis** a refined evolutionary model of chicken breed formation proposed, which included egg, meat, dual dual-purpose types, and ambiguous breeds.

Innovation points

A series of tables and figures summarizing the genetic architecture data of 49 bird populations was compiled

Table 1│Characteristics of runs of homozygosity (ROHs) on average for the populations of the main chicken breeds studied.

Figure 1│Genetic identification and clustering of populations by multivariate scaling (MDS) in all 49 breeds and subpopulations distributed among four clusters.

Figure 2│Effective population size in all 49 chicken populations.

Figure 3│The ADMIXTURE-assisted rugged (and ragged) landscape of global ancestry, with the optimal number of ancestral populations being K = 29, in the gene pool breeds/subpopulations.

Figure 4│A phylogenetic tree based on SNP genotypes and visualizing relationships among 49 chicken breeds and (sub)populations