

Diversity of LEI0258 microsatellite locus in indigenous Ethiopian chickens

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Global Agenda for Sustainable Livestock



Food and Agriculture Organization of the United Nations



INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE



Key messages

- Indigenous chicken are locally adapted to environmental challenges and provide subsistence to millions of farmers in Africa
- Their productivity remained low compared to exotic chicken strains
- African Chicken Genetic Gain project (<https://africacgg.net>) works to combine the local adaptation of indigenous chicken with productivity traits of exotic chicken
- Here, we report the diversity characterization of a genetic marker- LEI0258 found within the chicken major histocompatibility complex (MHC) regions in 14 different chicken populations (Figure 1)
- Genetic variation at the marker has been linked to infectious diseases resistance/susceptibility in commercial breeds

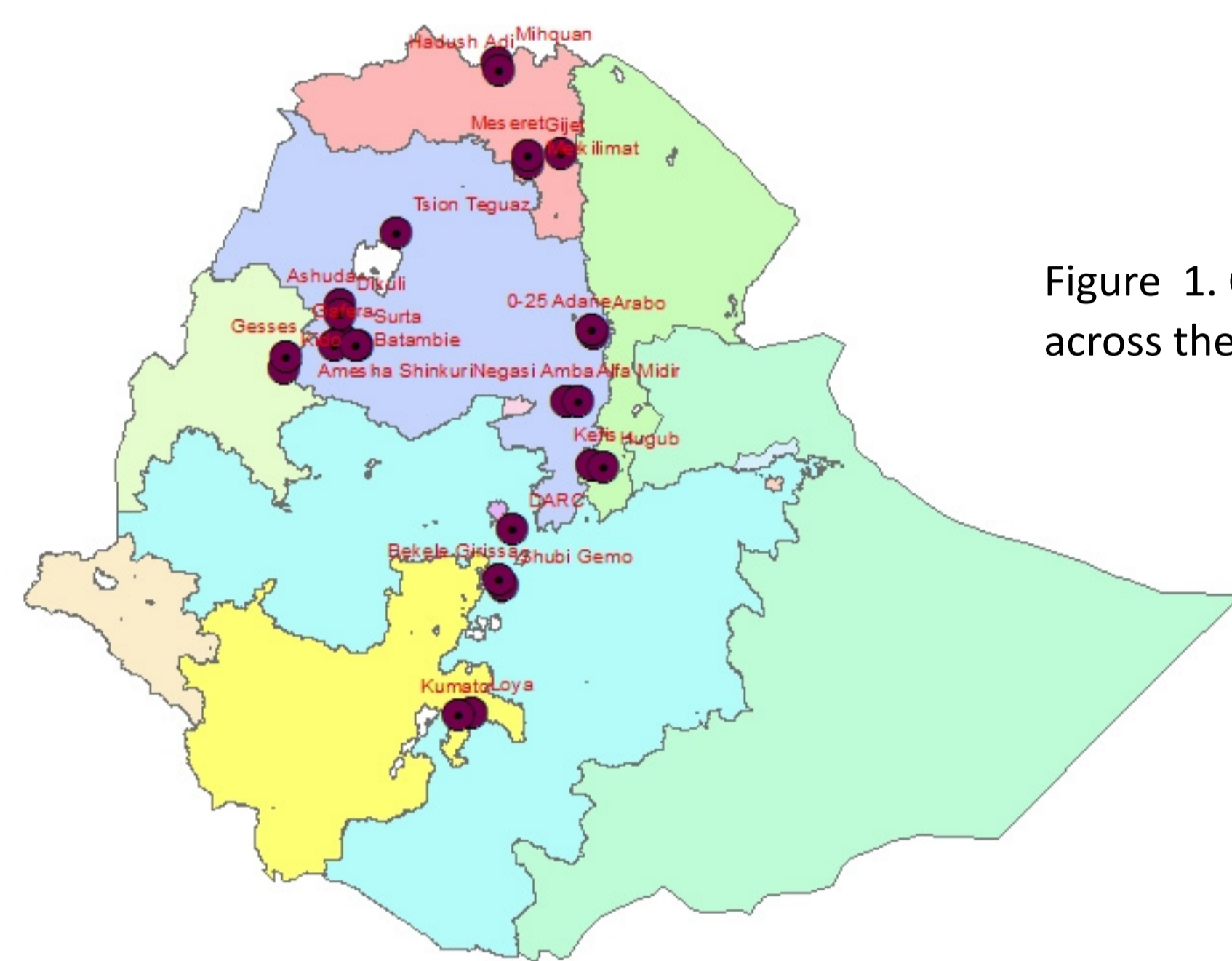


Figure 1. Chicken sampling sites across the country



Figure 2. Chicken producers in crop-livestock production systems

Livestock-based solutions

- Understanding the link between genetic diversity and environmental challenges is opening the door to marker-assisted breeding improvement programs for sustainable increasing poultry production at smallholders farmer level

Results and evidence

- Thirty LEI0258 alleles size were observed in 282 chicken from 14 populations on gel electrophoresis (Figure 4)
- Allele size ranges from 185–569 bp with no significant difference in allele frequencies between populations
- Allele frequencies were in Hardy and Weinberg in all population except in improved Horro and Dara ($P < 0.05$)
- Sequencing of some selected alleles has increased the total number of alleles to 37

Conclusions

- Very high diversity was found in Ethiopian indigenous chicken populations at LEI0258, this diversity is observed within the whole population
- Our results support the importance of MHC diversity in response to the disease challenges faced by smallholder poultry production in Ethiopia
- Breeding improvement programs will need to maximize this diversity



Fig 3. Chicken producers in pastoral systems

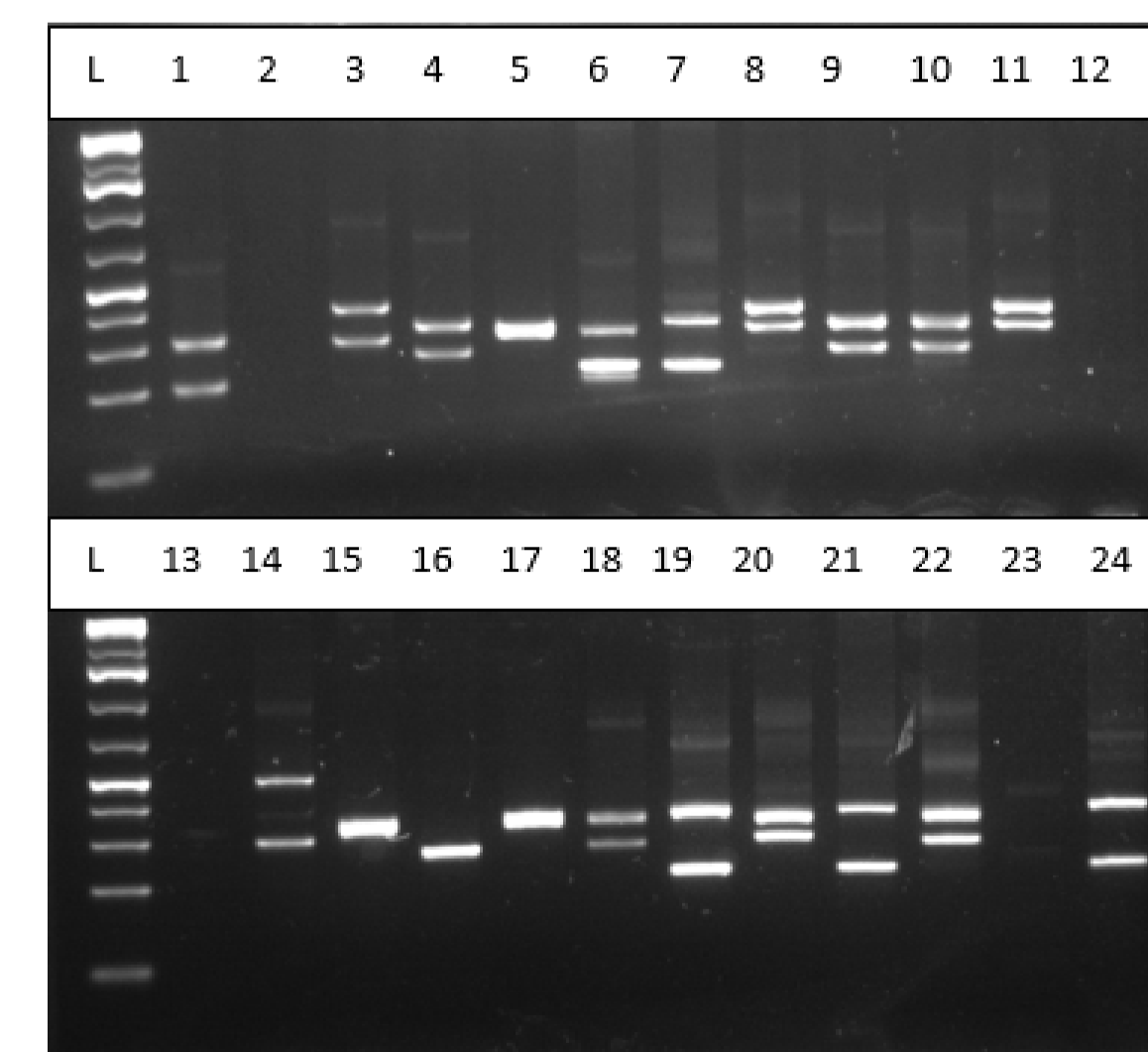


Figure 4. PCR amplicons of alleles in indigenous chicken of Ethiopia

Contact

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Partners



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