Francesco Perini,
PhD in animal science
University of Perugia

francesco.perini@studenti.unipg.it
Genetic characterization of indigenous chicken breeds of Italian North-central region

Francesco Perini, Filippo Cendron, Emiliano Lasagna, Martino Cassandro
Tubavi Project

• Conservation of biodiversity in Italian poultry breeds.

• MIPAAFT – National Rural Development Programme 2014/2020 – Conservation, use and sustainable development of genetic resources in agriculture.

• Funded with the support of the European Agricultural Fund for Rural Development (FEASR)’’

• Genetic characterization

https://www.pollitaliani.it/en/
<table>
<thead>
<tr>
<th>Breeds’ name</th>
<th>Acronym</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pepoi</td>
<td>PPP</td>
</tr>
<tr>
<td>Robusta Lionata</td>
<td>PRL</td>
</tr>
<tr>
<td>Robusta Maculata</td>
<td>PRM</td>
</tr>
<tr>
<td>Polverara Bianca</td>
<td>PPB</td>
</tr>
<tr>
<td>Polverara Nera</td>
<td>PPN</td>
</tr>
<tr>
<td>Padovana Argentata</td>
<td>PPA</td>
</tr>
<tr>
<td>Padovana Dorata</td>
<td>PPD</td>
</tr>
<tr>
<td>Padovana Camosciata</td>
<td>PPC</td>
</tr>
<tr>
<td>Millefiori di Lonigo</td>
<td>PML</td>
</tr>
<tr>
<td>Ermellinata di Rovigo</td>
<td>PER</td>
</tr>
<tr>
<td>Modenese</td>
<td>MOD</td>
</tr>
<tr>
<td>Romagnola</td>
<td>ROM</td>
</tr>
<tr>
<td>Ancona</td>
<td>ANC</td>
</tr>
</tbody>
</table>
Material & methods

**Sample collection**
Blood from 24 animals per breed

**DNA extraction**
DNA was extracted by Neogen (Scotland) using a commercial kit

**Genotyping**
It was performed by Neogen (Scotland) using Affymetrix Axiom 600 K Chicken Genotyping Array

**Plink 1.9 pruning**
(i) SNPs with a call rate < 95% and (ii) minor allele frequency < 5%, and (iii) animals with more than 10% of missing genotypes were removed.
After filtering the number of SNPs was 474,412

**Genetic diversity indices**
PLINK 1.9 software was used to estimate observed (Ho) and expected (He) heterozygosity, inbreeding value (Fhom), and average minor allele frequency (MAF).

**Genetic distance**
PLINK 1.9 → MDS-plot
FigTree → Neighbor-network of Reynolds’ distances.
Genetic diversity indices
Genetic distance results
Population structure and genetic distances showed a clear separation among the breeds with some particular clusters related to the region of origin and their own history.

The results show the existence of genetic variability. Heterozygosity values higher in central region breeds, and homozygosity coefficient more in Veneto region breeds.

Design new conservation programs. Available genetic traceability method according to the excellent ability to distinguish between the various breeds.
• This work was supported by the project: “Protection of biodiversity of Italian poultry breeds" - TuBaVi - 2014 – 2020. PSRN - Support for the conservation use and sustainable development of genetic resources in agriculture, sub-measure 10.2.

• We would like to thank:
  • conservation centers I.I.S. “Duca degli Abruzzi” Padova (Italy),
  • I.S.I.S.S. “D. Sartor” Castelfranco Veneto (Treviso, Italy),
  • I.I.S. “A. Della Lucia” Feltre (Belluno, Italy),
  • Experimental farm “Sasse Rami” Ceregnano (Rovigo, Italy),
  • STUARD farm (Parma, Italy),
  • University of Bologna (Bologna),
  • “Il Gallolarino” farm by Dalia Roberto (Monte S. Giovanni Campano, Frosinone, Italy),
  • Acquaroli Gabriele farm (Monteprandone, Ascoli Piceno, Italy) for supplying blood samples of chicken breeds.
Thank you

Questions?