

## Supplementary information

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

Natalia V. DEMENTIEVA<sup>1</sup>, Yuri S. SHCHERBAKOV<sup>1</sup>, Olga I. STANISHEVSKAYA<sup>1</sup>,  
Anatoly B. VAKHRAMEEV<sup>1</sup>, Tatiana A. LARKINA<sup>1</sup>, Artem P. DYSIN<sup>1</sup>, Olga A. NIKOLAEVA<sup>1</sup>,  
Anna E. RYABOVA<sup>1</sup>, Anastasiia I. AZOVTSEVA<sup>1</sup>, Olga V. MITROFANOVA<sup>1</sup>, Grigoriy K. PEGLIVANYAN<sup>1</sup>,  
Natalia R. REINBACH<sup>1</sup>, Darren K. GRIFFIN<sup>2</sup>, Michael N. ROMANOV<sup>2,3</sup>

<sup>1</sup>Russian Research Institute of Farm Animal Genetics and Breeding – Branch of the L. K. Ernst Federal Research Centre for Animal Husbandry, Pushkin, St. Petersburg, 196601, Russia

<sup>2</sup>School of Biosciences, University of Kent, Canterbury, CT2 7NJ, UK

<sup>3</sup>L. K. Ernst Federal Research Center for Animal Husbandry, Dubrovitsy, Podolsk, Moscow Oblast, 142132, Russia

**Table S1 Forty-nine chicken breeds, strains and crosses used in the study and listed in accordance with the Traditional Classification Model (Larkina *et al.* 2021)**

| Breed/population                           | Abbreviation | Origin                | Initial breeds  | Other  | No. of samples | Sampling source <sup>1</sup> , year |
|--|--------------|-----------------------|---|--|----------------|-------------------------------------|
| Egg-type breeds/populations                |              |                       |   |  |                |                                     |
| Leghorn Light Brown (or Italian Partridge) | LLB          | Italy                 | local light breeds from Tuscany                             | probable random mating to Czech Golden                                       | 19             | BC/RRIFAGB, 2016                    |
| Minorca Black                              | MB           | Spain, UK             | local Minorcan chickens                                     | probable random mating to PB and AoB   | 19             | BC/RRIFAGB, 2016                    |
| Russian White                              | RWG          | Pushkin, Russia       | local chickens mated to White Leghorn                       | produced from RWS using a single telic mating to White Leghorns              | 30             | BC/RRIFAGB, 2016                    |
|  | RWS          |                       |   | an inbred strain selected for cold tolerance (maintained as Lines 10 and 16) | 6              | SB/RRIFAGB, 2001                    |
|  | RWP          | Sergiev Posad, Russia |   | samples obtained from an ARPRTI population                                   | 11             | SB/RRIFAGB (ARPRTI), 2001           |
| Meat and related breeds/populations        |              |                       |   |  |                |                                     |
| White Cornish                              | WC1          | England, Russia       | local game chickens, Asil, White Malay, Indian Game, Cochin | inrabreed three-way hybrid maintained <i>inter se</i>                        | 22             | SB/RRIFAGB, 2007                    |
|  | WC2          |                       |   | line A   | 18             | SB/RRIFAGB, 2006                    |
|  | WC3          |                       |   | line B   | 19             | SB/RRIFAGB, 2006                    |
| Red White-tailed Dwarf                     | RWD          | England               | Plymouth Rock White, NH                                     | a purebred parental strain   | 18             | BC/RRIFAGB, 2016                    |

| Dual purpose breeds/populations                     |     |                                  |  |   |    |                  |
|---|-----|----------------------------------|--|---|----|------------------|
| <i>Egg-meat type and related breeds/populations</i> |     |                                  |  |   |    |                  |
| Zagorsk Salmon                                      | ZS  | Sergiev Posad,<br>USSR/Russia    | Russian White, NH, RIR, YC   | probable random mating to<br>FS                   | 18 | BC/RRIFAGB, 2016 |
| Pushkin   | Pu  | Pushkin,<br>USSR/Russia          | ABS, White Leghorn, Moscow White, PRB,<br>commercial cross Broiler-6                         | a purebred strain                                 | 20 | BC/RRIFAGB, 2016 |
| Rhode Island Red                                    | RIR | USA                              | Cochin, Java, Malay, Shanghai, Brown<br>Leghorn  | a non-selected population<br>randomly mated to NH | 32 | BC/RRIFAGB, 2016 |
| Leningrad Mille Fleur                               | LMF | Pushkin,<br>USSR/Russia          | ABS, NH, PC  | a single telic mating to<br>Orloff                | 21 | BC/RRIFAGB, 2016 |
| New Hampshire                                       | NH  | USA                              | RIR  | probable random mating to<br>MG, PC and RIR       | 19 | BC/RRIFAGB, 2016 |
| Leningrad Golden-and-<br>gray                       | LGG | Pushkin,<br>USSR/Russia          | ABS, White Leghorn, Moscow White, PRB,<br>LLB, NH  | a purebred strain                                 | 20 | BC/RRIFAGB, 2016 |
| Pantsirevka Black                                   | PB  | Ulyanovsk Oblast,<br>USSR/Russia | White Leghorn, RIR, NH, AoB, Plymouth<br>Rock White  | probable random mating to<br>AoB and MB           | 17 | BC/RRIFAGB, 2016 |
| <i>Meat-egg type and related breeds/populations</i> |     |                                  |  |   |    |                  |
| Australorp Black<br>Speckled                        | ABS | Pushkin,<br>USSR/Russia          | AoB  | a purebred strain                                 | 20 | BC/RRIFAGB, 2016 |
| Aurora Blue   | AB  | Pushkin, Russia                  | ABS  | probable random mating to<br>AoB                  | 20 | BC/RRIFAGB, 2016 |
| Australorp Black                                    | AoB | Australia                        | Black Orpington, RIR, MB, White Leghorn,<br>Langshan, Plymouth Rock                          | probable random mating to<br>PB and MB            | 9  | BC/RRIFAGB, 2016 |
| Amrock  | Ar  | USA, Germany                     | PRB that was imported from USA and<br>originated from Dominique, Cochin Black,<br>Java Black | probable random mating to<br>PRB                  | 20 | BC/RRIFAGB, 2016 |
| Naked Neck  | NN  | Transylvania,<br>Romania         | local chickens   | a purebred strain                                 | 20 | BC/RRIFAGB, 2016 |
| Pervomai  | Pm1 | USSR/Ukraine,<br>Russia          | Wyandotte White, RIR, YC   | probable random mating to<br>SL and BL            | 20 | BC/RRIFAGB, 2016 |
|   | Pm2 |                                  |  | sampled from fancy<br>breeders                    |    | SB/ RRIFAGB      |
| Plymouth Rock Barred                                | PRB | USA                              | Java Black, Brahma, Cochin White and<br>Buff, Dominique, White-faced Black<br>Spanish        | probable random mating to<br>Ar                   | 19 | BC/RRIFAGB, 2016 |
| Poltava Clay  | PC  | USSR/Ukraine                     | local chickens, Buff Orpington, NH,<br>Wyandotte and others                                  | a purebred strain                                 | 17 | BC/RRIFAGB, 2016 |

|  |      |                                 |   |  |    |                  |
|--|------|---------------------------------|---|--|----|------------------|
| Sussex Light   | SL1  | England                         | local chickens, Brahma, Cochin, Dorking   | probable random mating to Pm and BL                                | 20 | BC/RRIFAGB, 2016 |
|  | SL2  |                                 |   | sampled from fancy breeders  |    | SB/RRIFAGB       |
| Faverolles Salmon  | FS   | France                          | local chickens, Brahma, Houdan, Dorking, Cochin, Langshan                               | probable random mating to ZS                                       | 20 | BC/RRIFAGB, 2016 |
| Tsarskoye Selo   | Ts   | Pushkin, Russia                 | PRB, PC, NH, commercial cross Broiler-6   | a purebred strain  | 20 | BC/RRIFAGB, 2016 |
| Yurlov Crower  | YC   | Russia                          | local and game chickens, Brahma, Cochin, Langshan                                       | of two varieties (silver and golden); probable random mating to UG | 20 | BC/RRIFAGB, 2016 |
| Game and related breeds/populations                          |      |                                 |   |  |    |                  |
| Orloff Mille Fleur   | OMF  | Russia                          | local chickens, Gilan, Old English Game   | a purebred strain (with added DNA samples from Orloff Mahogany)    | 20 | BC/RRIFAGB, 2016 |
| Moscow Game  | MG   | Russia                          | local chickens, Gilan, Old English Game, Malay, other game breeds from Belgium and Asia | probable random mating to NH and PC                                | 20 | BC/RRIFAGB, 2016 |
| Uzbek Game (Kulangi)   | UG   | Uzbekistan                      | local Uzbek game chickens   | probable random mating to YC                                       | 19 | BC/RRIFAGB, 2016 |
| Fancy and Bantam breeds/populations                          |      |                                 |   |  |    |                  |
| Russian Crested  | RC   | Russia                          | local chickens  | probable random mating to other breeds                             | 19 | BC/RRIFAGB, 2016 |
| Ukrainian Muffed (or Russian Ushanka, South Russian Ushanka) | UM   | Ukraine, South Russia           | local chickens  | probable random mating to other breeds                             | 18 | BC/RRIFAGB, 2016 |
| Bantam Mille Fleur (or Russian Korolyok)                     | BMF  | Russia                          | local chickens with putative ancestors from Southeast Asia and Europe                   | a purebred strain  | 20 | BC/RRIFAGB, 2016 |
| Brahma Buff  | BB   | India, USA                      | Cochin, Gray Chittagong (of Malay type)   | a purebred strain  | 20 | BC/RRIFAGB, 2016 |
| Brahma Light   | BL   | India, USA                      | Cochin, Gray Chittagong (of Malay type)   | a purebred strain  | 20 | BC/RRIFAGB, 2016 |
| Hamburg Silver Spangled Dwarf                                | HSSD | The Netherlands, United Kingdom | local North Sea coast chickens, chickens from Ottoman Empire                            | an inbred strain   | 20 | BC/RRIFAGB, 2016 |
| Poland White-crested Black                                   | PWB  | The Netherlands, Poland?        | local chickens, Czubatka chickens from Poland   | a purebred strain  | 18 | BC/RRIFAGB, 2016 |
| Silkie White   | SW   | China, Southeast Asia           | local chickens  | a purebred strain  | 19 | BC/RRIFAGB, 2016 |
| Cochin Bantam (or Pekin Bantam)                              | CBm  | China                           | Cochin  | of three varieties CBm1, CBm2 and CBm3 (black, mottled, white)     | 20 | BC/RRIFAGB, 2016 |

|                 |     |                    |  |   |    |                  |
|-----------------|-----|--------------------|--|---|----|------------------|
| Cochin Blue     | CBI | China, USA         | Shanghai   | a purebred strain   | 18 | BC/RRIFAGB, 2016 |
| Frizzle         | F   | South Asia, Europe | local chickens   | various dual purpose breeds mated, with keeping the frizzle trait | 20 | BC/RRIFAGB, 2016 |
| Pavlov Spangled | PS  | Pushkin, Russia    | extinct old Russian native breed; currently, being restored from FS, Appenzeller, Padovana, SW, Houdan                               | of two varieties (silver and golden)                              | 20 | BC/RRIFAGB, 2016 |
| Pavlov White    | PW  | Pushkin, Russia    | extinct old Russian native breed, supposedly related to Sultan; currently, being restored from FS, Appenzeller, Padovana, SW, Houdan | a purebred strain   | 15 | BC/RRIFAGB, 2016 |

<sup>1</sup> Abbreviations: BC/RRIFAGB, Bioresource Collection/Russian Research Institute of Farm Animal Genetics and Breeding; SB/RRIFAGB, sample bank/RRIFAGB; ARPRTI, All-Russian Poultry Research and Technological Institute.

## Reference

Larkina TA, Barkova OY, Peglivanyan GK, et al., 2021. Evolutionary subdivision of domestic chickens: implications for local breeds as assessed by phenotype and genotype in comparison to commercial and fancy breeds. *Agriculture*, 11(10):914. <https://doi.org/10.3390/agriculture11100914>