*Journal of Pest Science*

# Population genetics and genotyping as tools for planning rat management programs

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# Supplementary materials

**Table S1 Microsatellite markers used in this study**

**Table S2 Description of the animals captured per site**

Number of males + number females differs from the total number of individuals trapped (N) because of missing data

**Table S3 Characterisation of 13 microsatellite loci genotyped in 355 *R. norvegicus* from 17 populations in eastern France**

Number of alleles: Number of alleles per locus, $P_{null}$: van Oosterhout estimate for the frequency of null alleles at each locus**,** $PID_{unbiaised}$: unbiased probability of identity, $PID_{sib}$: probability of identity for siblings

**Fig. S1 Scatterplot of the p-values (corrected with FDR method) resulting from linkage disequilibrium tests between pairs of the 13 microsatellite loci and for each site**

**Fig. S2 Genetic isolation by distance patterns in *Rattus norvegicus* populations from the different sites in the three studied municipalities**

**a** Givors (six sites), **b** Saint-Romain-de-Popey (six sites), and **c** Lyon city (five sites). Linearized genetic distances ($F_{ST}/(1-F_{ST})$) are regressed upon log Euclidean geographical distances between sites

**Fig. S3 Boxplot and scatterplot of the pairwise $F_{ST}$ estimates between population pairs located within municipalities ($F_{STintra}$) and between population pairs located in different municipalities ($F_{STextra}$)**

**Fig. S4 Frequency of the *Vka* (first line) and *Vkc* (second line) alleles in the three investigated municipalities, Givors (GIV), Saint-Romain-de-Popey (ROM), and Lyon (LYO)**

## Table S1 Microsatellite markers used in this study

| Microsatellite | Repeat | Primer sequence 5'−3' | Dye | Size range (bp) | Primer concentration (μM) |
|---|---|---|---|---|---|
| *D5Rat43* | (GT)20 | F: AGCCCTTAAGCTGAGCTACAGA<br>R: GGCACCAGGCATACTCATG | 6−FAM | 199−207 | 0.2 |
| *D8Rat162* | (AC)24(TC)13 | F: TCTGAGACCTCTTCAACTCTGTTG<br>R: TCACTGGCAGCAATTTACCA | PET | 220−270 | 0.4 |
| *D10Rat105* | (GT)8GA(GT)17 | F: ATCCAGCCAGAAAGCAAAAC<br>R: CTGGCTGAGTCCTGTCACAA | NED | 98−108 | 0.2 |
| *D12Rat49* | (GT)18 | F: AAATGATCCAGGCTCTGGAC<br>R: CTCAGAAGGACACACATGCA | VIC | 117−133 | 0.2 |
| *D14Rat110* | (CA)14GA(CA)16(GA)10(N)12(GA)11(N)12(GA)8CA(GA)4(N)12(GA)14 | F: CTCCACCCACACACCACG<br>R: AACATTGTCTTGCTTAGCCTCA | 6−FAM | 258−312 | 0.2 |
| *D20Mit4* | (GT)18 | F: CACACCCAATGAATGCTCTG<br>R: TAAATTCAGAGTGTTGTTCCTGC | PET | 193−211 | 0.2 |
| *D2Rat97* | (CA)19(N)15(A)7 | F: TCTGGCCTTCTCATATTCTGA<br>R: TGCTGTGCTGGCTATGTAATG | 6−FAM | NA | 0.2 |
| *D3Rat159* | (CA)21 | F: CTGGTCTGCTTCCTCCAGTC<br>R: CCAGGGATGAGTCCAAGGTA | NED | 239−259 | 0.2 |
| *D4Rat59* | (CA)28 | F: GCGGAATGATAGTTACTACGGC<br>R: GCAGTGTGTTTGGGGTAGCT | VIC | 163−183 | 0.2 |
| *D11Rat11* | (CA)4CG(CA)22 | F: TCCCTGTTCCTATCTGGTCCT<br>R: AACTGTTGCCAGCATTAGGC | PET | 147−157 | 0.2 |
| *D13Rat21* | (CA)24 | F: ACCCTGAAGTCAGCCTCTGA<br>R: ACCACAGCATTTCTCTCGCT | NED | 124−150 | 0.2 |
| *D15Rat64* | (TG)22 | F: AGACATAGGGCTGTAGGGCA<br>R: GCATGTACCGTTCTTGCAGA | PET | 111−121 | 0.2 |
| *D18Rat116* | (GT)4AT(GT)23 | F: TCCACTGTTCCAGGGAAGAC<br>R: TGCATATCCTTTTGCAACCA | VIC | 222−244 | 0.2 |
| *D19Rat62* | (GT)11 | F: TGAATTCTACCATGCATCACAG<br>R: GGCTTTCCCCACTGTTCTGG | 6−FAM | 94−104 | 0.2 |
| *Vka* | (CT)23(GT)22 | F: ACACTAAGACGTCACACTGG<br>R: CACTTAGCAAGCAGAGGCAG | VIC | 320−344 | 0.2 |
| *Vkc* | (CA)25 | F: CCTCTCAGCCTGAGCTTGAC<br>R: GCATATTCCAGGCCATTCAG | NED | 321-341 | 0.2 |

**Table S2 Description of the animals captured per site**

Number of males + number females differs from the total number of individuals trapped (N) because of missing data

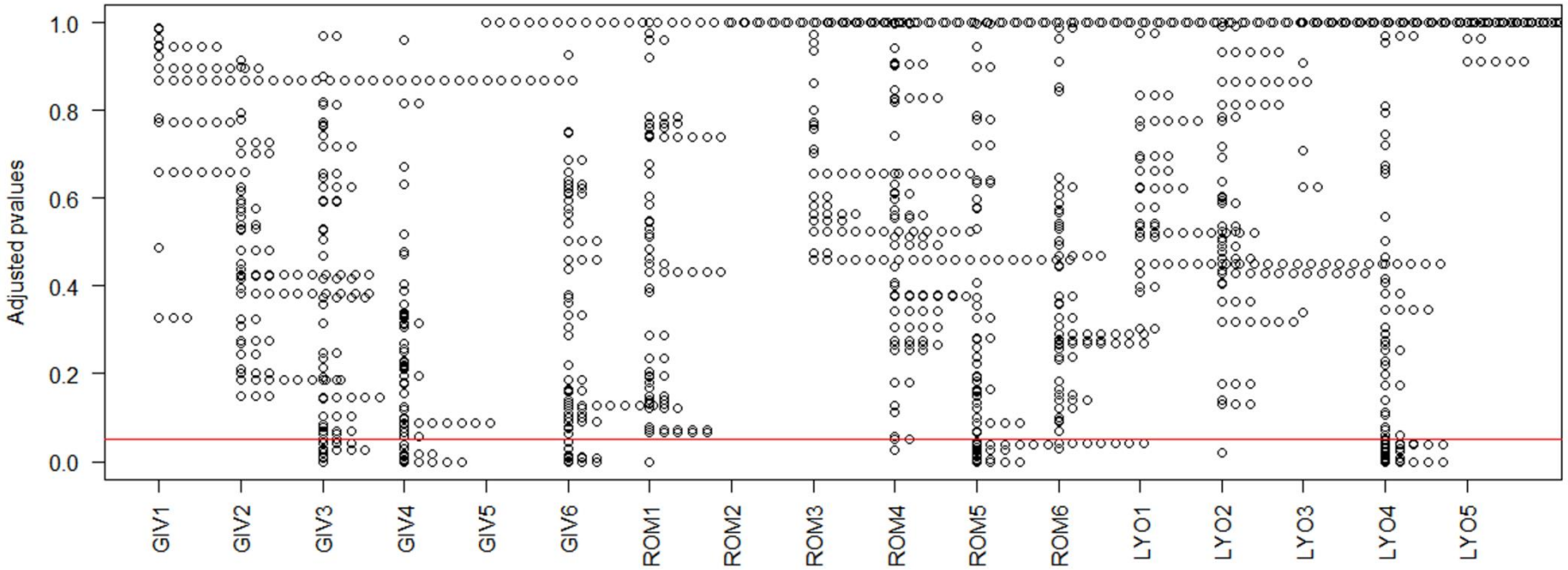
| | | GIV | ROM | LYON |
|---|---|---|---|---|
| **Site 1** | N | 21 | 18 | 18 |
| | Number of males | 4 | 7 | 8 |
| | Number of females | 15 | 8 | 7 |
| | Median weight in grams (range) | 270 (37–398) | 271 (142–351) | 200 (23–310) |
| **Site 2** | N | 28 | 6 | 12 |
| | Number of males | 4 | 1 | 10 |
| | Number of females | 2 | 5 | 2 |
| | Median weight in grams (range) | 238.5 (148–470) | 55.5 (41–99) | 244 (188–350) |
| **Site 3** | N | 64 | 8 | 9 |
| | Number of males | 29 | 6 | 8 |
| | Number of females | 35 | 2 | 1 |
| | Median weight in grams (range) | 190 (12–464) | 140.5 (82–265) | 283 (81–445) |
| **Site 4** | N | 29 | 28 | 22 |
| | Number of males | 6 | 11 | 18 |
| | Number of females | 16 | 13 | 4 |
| | Median weight in grams (range) | 149.5 (36–310) | 247 (13–388) | 71.5 (52–374) |
| **Site 5** | N | 6 | 40 | 6 |
| | Number of males | 2 | 7 | 4 |
| | Number of females | 1 | 12 | 2 |
| | Median weight in grams (range) | 368 (123–378) | 181 (71–335) | 377 (124–492) |
| **Site 6** | N | 22 | 18 | |
| | Number of males | 17 | 3 | / |
| | Number of females | 4 | 11 | |
| | Median weight in grams (range) | 85 (25–360) | 63 (36–259) | |
| **All sites** | N | 170 | 118 | 67 |
| | Number of males | 62 | 35 | 48 |
| | Number of females | 73 | 51 | 16 |
| | Median weight in grams (range) | 181 (12–470) | 184 (13–388) | 204 (23–492) |

**Table S3 Characterisation of 13 microsatellite loci genotyped in 355 *R. norvegicus* from 17 populations in eastern France**

Number of alleles: Number of alleles per locus, $P_{null}$: van Oosterhout estimate for the frequency of null alleles at each locus**,** $PID_{unbiaised}$: unbiased probability of identity, $PID_{sib}$: probability of identity for siblings

| **Microsatellite** | **Number of alleles** | **$P_{null}$** | **$PID_{unbiaised}$** | **$PID_{sib}$** |
|---|---|---|---|---|
| *D5Rat43* | 5 | 0 | 0.154 | 0.448 |
| *D8Rat162* | 14 | 0.0035 | 0.0507 | 0.351 |
| *D10Rat105* | 5 | 0.0006 | 0.159 | 0.448 |
| *D12Rat49* | 9 | -0.0805 | 0.0929 | 0.4 |
| *D14Rat110* | 17 | -0.1032 | 0.0214 | 0.312 |
| *D20Mit4* | 7 | -0.0416 | 0.0836 | 0.385 |
| *D2Rat97* | NA | - | - | - |
| *D3Rat159* | 12 | 0.0705 | 0.0791 | 0.381 |
| *D4Rat59* | 10 | 0.0107 | 0.0247 | 0.316 |
| *D11Rat11* | 6 | -0.1617 | 0.138 | 0.438 |
| *D13Rat21* | 9 | -0.1617 | 0.0813 | 0.388 |
| *D15Rat64* | 6 | -0.2018 | 0.171 | 0.463 |
| *D18Rat116* | 14 | -0.1538 | 0.0746 | 0.376 |
| *D19Rat62* | 6 | -0.1509 | 0.167 | 0.454 |

**Fig. S1 Scatterplot of the p-values (corrected with FDR method) resulting from linkage disequilibrium tests between pairs of the 13 microsatellite loci and for each site**



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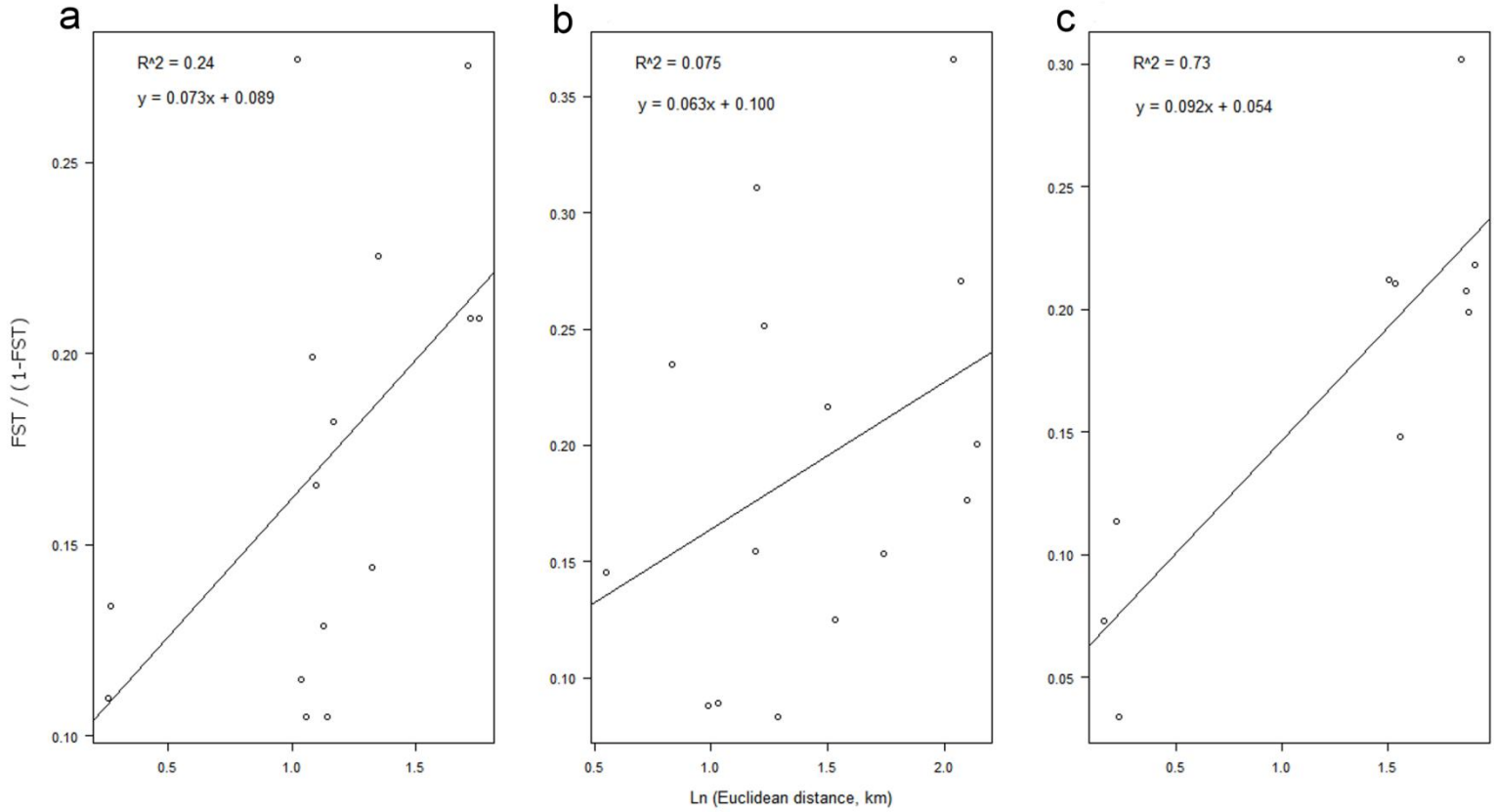

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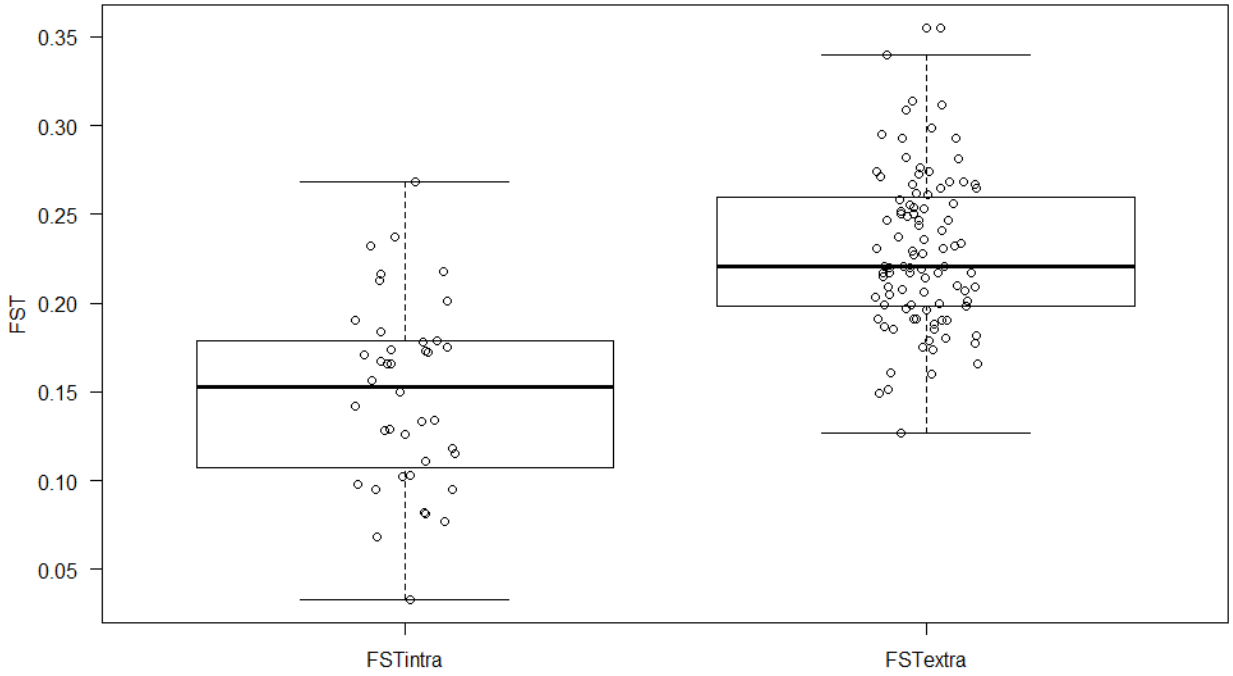

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