

**Fig. S1:** Geographic locations of collection sites for the studied 120 apricot genotypes from Kashmir and Ladakh regions of India

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**Fig. S2:** Scatter diagram of PCoA of the 120 apricot genotypes (Numbers of each genotype correspond to those of Table S3).

**Table S1**: Geographical description for collection areas of apricot genotypes of Kashmir and Ladakh provinces in India

|  |  |  |  |
| --- | --- | --- | --- |
| S. No | Collection Site | GPS Coordinates | Genotype/Cultivar |
| 1. | Rangil, Ganderbal | 34̊ 12ꞌ 55.53" N74̊ 48ꞌ 32.85" E  | Amb Cher, Khubani.  |
| 2. | Govt. Horticultural Nursery, Zakura Srinagar | 34̊ 9ꞌ 21.68" N74̊ 50ꞌ 25.1" E | Yerwani, Stanei.  |
| 3. | Manasbal, Safapora, Ganderbal | 340 14' 49.84"N740 40' 14.82" E  | MAN UNK-01, MAN UNK-02, MAN UNK-03, MAN UNK-04, MAN UNK-05, MAN UNK-06, MAN UNK-07, MAN UNK-08, MAN UNK-09, MAN UNK-10.  |
| 4. | Kashmir University Botanical Garden, Srinagar | 340 7′51.2″ N740 50′1.41″ E  | KUBG-01, KUBG-02, KUBG-03.  |
| 5. | Central Institute of Temperate Horticulture, Rangret, Srinagar | 330 59ꞌ 4.37" N740 48ꞌ 0.38" E  | CITH AP 01, CITH AP 02, CITH AP 03, Harcot, Balcota, Erani, Chinese, Rival, Tilton, Tok Popa Nemu, Afghani, Heartly, Communis, Communis Holly, Australlian, Turkey, Fairmedcester, New Castle, Viva Gold |
| 6. | Wahipora, Kupwara  | 340 4ꞌ 12.78" N740 27ꞌ 20.97" E  | Boett Cher |
| 7. | Charar-e-Sharief , Budgam | 330 50′51.1″ N740 45′20.59″ E  | Shereen Dahan, Badaam Cher, Chanun Cher, Taett Cher, Boett Cher 01. Boett Cher 02.  |
| 8. | Govt. Horticultural Nursery, Shopian (GHS) | 330 47ꞌ 01.33" N750 00ꞌ 20.41" E  | Gold Rich, Perfection, Halman, Raktseykarpo, Amba, Gold Cot.  |
| 9. | Govt. Horticultural Nursery, Raipora, Lar Ganderbal | 340 15ꞌ 05.85" N740 44ꞌ 33.91" E  | Italian AP-01, Italian AP-02, Italian AP-03.  |
| 10. | Chewa Bandipora (CBR)  | 340 16ꞌ 22.86" N740 41ꞌ 9.97" E | CHE UNK-01, CHE UNK-02, CHE UNK-03, CHE UNK-04, CHE UNK-05, CHE UNK-06, CHE UNK-07, CHE UNK-08, CHE UNK-09, CHE UNK-10, CHE UNK-11, CHE UNK-12, CHE UNK-13, CHE UNK-14, CHE UNK-15. |
| 11. | Badampora, Ganderbal | 340 13ꞌ30.67"N740 41ꞌ 29.46"E  | Boett Cher 01, Boett Cher 02. |
| 12. | Nesbal, Sumbal, Bandipora | 340 14ꞌ 40.18"N740 40ꞌ 15.18"E  | NES UNK-01, NES UNK-02, NES UNK-03, NES UNK-04, NES UNK-05. |
| 13. | Guroora, Bandipora  | 340 22ꞌ 9.89"N740 40ꞌ 14.17"E  | Poeh Cher |
| 14. | Watlar, Ganderbal | 340 15ꞌ 47.94"N740 46ꞌ 45.96"E  | Boett Cher 01, Boett Cher 02. |
| 15. | Zakura, Srinagar | 340 9ꞌ 21.68" N740 50ꞌ 25.1" E  | Awal Number |
| 16. | Kargil (Main) | 340 33ꞌ33.99" N760 7ꞌ 32.15" E | Quvan Margulam, Shakanda Farm |
| 17. | Batalik Kargil | 340 39ꞌ1.24" N760 21ꞌ 7.14" E | Quvan Narmo, Khantay Gosmin |
| 18. | Chuli Chang Kargil | 340 39ꞌ47.93" N760 18ꞌ 46.28" E | Moti Tilee Chuli Chan, Leela Tilee Chuli Chan, Peechank Tilee Chulichan |
| 19. | Sanjak Kargil | 340 34ꞌ43.97" N760 31ꞌ 34.98" E | Tub Chi Chuli, Khantay Aloo Chuli, Quvan Sanjak, Bar Quick |
| 20. | Goma Kargil | 340 26ꞌ3.39" N760 17ꞌ 33.93"E | Ston Chuli, Shakanda Goma (Kargil), Shak Chuli  |
| 21. | Baroo Kargil | 340 32ꞌ39.6" N760 08ꞌ 09.8" E | Shakanda Khantay, Khantay Khorma Chuli, Chongo Chuli Khantay, Khantay Khorma Chuli |
| 22. | Minji Kargil | 340 26ꞌ43.3" N760 05ꞌ 39.7" E | Wan Chuli, Khapuck Khantay Chuli, Sar Quvan, Gron Chuli, Quvan Chuli (Minji), Drongmar |
| 23. | Gargardo Road  | 340 39ꞌ29.7" N760 20ꞌ 48.4" E | Karpo-Meen, Gothuroo, Rakchaykarpo, Quvan Narmo Gargardo, Mamorae |
| 24. | Akchamal Kargil | 340 33ꞌ39.3" N760 09ꞌ 48.9" E | Nosnpo Chuli, Narmo Seir, Gvan Garmo, Fating Chuli  |
| 25. | Mangbor Kargil | 340 33ꞌ40.7" N760 09ꞌ 13.4" E | Chapa Cha Chuli khantay, Shakanda Mangbor  |
| 26. | Silkche Kargil | 340 35ꞌ10.0" N760 07ꞌ 34.1" E | Badana Narmo, Khaparick Narmo, Zan Chuli Narmo  |
| 27. | Chanigound Kargil | 340 35ꞌ49.1" N760 03ꞌ 29.5" E | Punar Gozi |
| 28. | Karkit Kargil | 340 32ꞌ32.4" N760 03ꞌ 01.4" E | Rgasat |
| 29. | Achani-thang, Leh | 340 30' 20.16"N760 37' 39.36" E | Aam Chuli, Nagpo Chuli |

**Table S2:** List of 21 SSR markers used in the study with their sequences

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Primer name | Forward sequence | Reverse sequence | Tm(°C) | Reference |
| DQ295809 | ACCACCTCTTGCAAAGAACC | GAAATTTCAAGCACACGATCC | 60 | Vilanova *et al.,* 2006 |
| DQ295817 | CAATACAAAATGGGCCATGC | AGCCCGTGTTCATTGATTTT | 57 |
| DQ295818 | GCATCACTGCAATCCAGAAA | CCCATGGGGTAAGTTAAGC | 56 |
| DQ295823 | ACCAATAACGGGTGATCCAA | AGGAGGAGGATGAGGGAGAG | 51 |
| RPPG1-017 | GCTCATCAAAACTCTCAACCA | CCCTTTCTTCAATCCCATC | 60 | Dettori et al., 2015 |
| RPPG1-026 | CTTCTGGCACTCTTCCATTT | GTTCCCAAGTTTTCCTCTCA | 60 |
| RPPG1-032 | ATGGCAGAGAGCACAACAA | TTGAGAGGTAACAGCGAGAA | 53 |
| RPPG1-037 | GTCTCTGATCCAAGCCAACT | ACGCTGCCATTGTTTCTATT | 53 |
| RPPG2-011 | TTTACAGGTGCCTCAACAAA | GTACAGCCGATGGAGAGAAA | 53 |
| RPPG2-022 |  CTGCTGCGTCTGATGATG | ACAGGACAGGACCACTTTCT | 53 |
| RPPG3-026 | AGAACGCTATTCCCCTGTAA | TCATCCTCTCCAAATGTCAA | 56 |
| RPPG4-059 | GACGGCTGTTTATTTGCATT | TGCATTTGTGATCTCGTTTC | 58 |
| RPPG4-067 | AGAAGGGAGGGTGAGAGAAG | CACGAAGGAAGAAACGAAGT | 49 |
| RPPG4-091 | GGAGGGTAGAGAACAGAGCA | CGGAAGATGTGATTGTGAGA | 58 |
| RPPG5-022 | CTTGTGAACTGGCATCTGTC | AGTTGTATGGGCATGTTGTG | 53 |
| RPPG5-030 | AAGGCAAGGAATTGGGTAGT | TGGTTTGTCGTAAGAGTCCA | 53 |
| RPPG6-009 | GGGCTTGGCTGATAAAATAA | TGGTAAAATAGAAGAGCGAGAAG | 56 |
| RPPG6-033 | CATTATCAAACCACGACCAA | AAAGCTCAACAGCGACTTCT | 53 |
| RPPG7-032 | AAGGGAGGAGGATTGTGAA | TGGTAGACGGGTAGATGTTG | 53 |
| RPPG8-007 | ACCACCACCTCTTCCAATC | ACCTCAAAGTGTCCCAGAAA | 58 |
| RPPG8-028 | AAGGAGCCGACATCAGAAC | TGACCAGAAGCCAAATACATC | 56 |

**Table S3:** Assignment of individuals to the sub populations (K) based on probability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Code | Genotype | K-1 | K-2 | K-3 | Assignment to sub-populations |
| 1 | Stanei | 0.055 | 0.106 | 0.839 | 3 |
| 2 | Gold Rich | 0.165 | 0.626 | 0.209 | 2 |
| 3 | Afghani | 0.041 | 0.832 | 0.127 | 2 |
| 4 | Communis Holly | 0.130 | 0.038 | 0.832 | 3 |
| 5 | Balcota | 0.038 | 0.323 | 0.638 | 3 |
| 6 | Chinese | 0.070 | 0.483 | 0.447 | ADMIXTURE |
| 7 | Gold Cot | 0.082 | 0.215 | 0.703 | 3 |
| 8 | Yerwani | 0.038 | 0.08 | 0.882 | 3 |
| 9 | Communis | 0.037 | 0.038 | 0.926 | 3 |
| 10 | Turkey | 0.046 | 0.049 | 0.905 | 3 |
| 11 | Fairmedcester | 0.114 | 0.173 | 0.712 | 3 |
| 12 | Tilton | 0.041 | 0.042 | 0.917 | 3 |
| 13 | Harcot | 0.092 | 0.037 | 0.870 | 3 |
| 14 | Australlian | 0.152 | 0.769 | 0.080 | 2 |
| 15 | New Castle | 0.350 | 0.136 | 0.515 | ADMIXTURE |
| 16 | Rival | 0.397 | 0.276 | 0.328 | ADMIXTURE |
| 17 | Erani | 0.088 | 0.104 | 0.809 | 3 |
| 18 | Perfection | 0.798 | 0.131 | 0.070 | 1 |
| 19 | Tok Popa Nemu | 0.884 | 0.068 | 0.048 | 1 |
| 20 | Heartly | 0.389 | 0.374 | 0.237 | ADMIXTURE |
| 21 | Viva Gold | 0.262 | 0.571 | 0.167 | ADMIXTURE |
| 22 | Halman | 0.068 | 0.829 | 0.104 | 2 |
| 23 | Raktseykarpo | 0.170 | 0.038 | 0.791 | 3 |
| 24 | Amba (Shopian) | 0.030 | 0.084 | 0.886 | 3 |
| 25 | CITH-AP-01 | 0.027 | 0.043 | 0.930 | 3 |
| 26 | CITH-AP-02 | 0.026 | 0.054 | 0.921 | 3 |
| 27 | CITH-AP-03 | 0.078 | 0.047 | 0.876 | 3 |
| 28 | Shereen Dahan | 0.042 | 0.921 | 0.037 | 2 |
| 29 | Chanun Cher | 0.053 | 0.909 | 0.038 | 2 |
| 30 | Badaam Cher | 0.098 | 0.839 | 0.063 | 2 |
| 31 | Boett Cher-01(Charar) | 0.109 | 0.844 | 0.046 | 2 |
| 32 | Boett Cher-02(Charar) | 0.052 | 0.406 | 0.542 | ADMIXTURE |
| 33 | Amb Cher | 0.205 | 0.638 | 0.157 | 2 |
| 34 | Khubani | 0.097 | 0.581 | 0.322 | ADMIXTURE |
| 35 | Poeh Cher | 0.065 | 0.866 | 0.069 | 2 |
| 36 | Awal Number | 0.892 | 0.074 | 0.034 | 1 |
| 37 | KUBG-01 | 0.048 | 0.738 | 0.215 | 2 |
| 38 | KUBG-02 | 0.776 | 0.126 | 0.098 | 1 |
| 39 | KUBG-03 | 0.086 | 0.859 | 0.055 | 2 |
| 40 | Italian -AP-01 | 0.785 | 0.122 | 0.093 | 1 |
| 41 | Italian-AP-02 | 0.784 | 0.123 | 0.093 | 1 |
| 42 | Italian -AP-03 | 0.163 | 0.617 | 0.220 | 2 |
| 43 | Boett Cher 01 (Watlar) | 0.060 | 0.904 | 0.037 | 2 |
| 44 | Boett Cher 02(Watlar) | 0.045 | 0.927 | 0.028 | 2 |
| 45 | Boett Cher 01 (Badampora) | 0.064 | 0.908 | 0.028 | 2 |
| 46 | Boett Cher 02 (Badampora) | 0.091 | 0.863 | 0.047 | 2 |
| 47 | Boett Cher (Kupwara) | 0.076 | 0.445 | 0.479 | ADMIXTURE |
| 48 | Taett cher | 0.047 | 0.54 | 0.413 | ADMIXTURE |
| 49 | UNK-CHE-01 | 0.319 | 0.037 | 0.644 | 3 |
| 50 | UNK-CHE-02 | 0.084 | 0.060 | 0.857 | 3 |
| 51 | UNK-CHE-03 | 0.064 | 0.770 | 0.167 | 2 |
| 52 | UNK-CHE-04 | 0.780 | 0.155 | 0.066 | 1 |
| 53 | UNK-CHE-05 | 0.450 | 0.268 | 0.282 | ADMIXTURE |
| 54 | UNK-CHE-06 | 0.394 | 0.493 | 0.113 | ADMIXTURE |
| 55 | UNK-CHE-07 | 0.246 | 0.086 | 0.668 | 3 |
| 56 | UNK-CHE-08 | 0.739 | 0.168 | 0.093 | 1 |
| 57 | UNK-CHE-09 | 0.421 | 0.178 | 0.401 | ADMIXTURE |
| 58 | UNK-CHE-10 | 0.171 | 0.044 | 0.785 | 3 |
| 59 | UNK-CHE-11 | 0.261 | 0.584 | 0.155 | ADMIXTURE |
| 60 | UNK-CHE-12 | 0.140 | 0.734 | 0.125 | 2 |
| 61 | UNK-CHE-13 | 0.822 | 0.054 | 0.124 | 1 |
| 62 | UNK-CHE-14 | 0.126 | 0.056 | 0.817 | 3 |
| 63 | UNK-CHE-15 | 0.522 | 0.076 | 0.402 | ADMIXTURE |
| 64 | UNK-MAN-01 | 0.570 | 0.329 | 0.102 | ADMIXTURE |
| 65 | UNK-MAN-02 | 0.090 | 0.157 | 0.753 | 3 |
| 66 | UNK-MAN-03 | 0.168 | 0.137 | 0.695 | 3 |
| 67 | UNK-MAN-04 | 0.457 | 0.29 | 0.253 | ADMIXTURE |
| 68 | UNK-MAN-05 | 0.608 | 0.178 | 0.214 | 1 |
| 69 | UNK-MAN-06 | 0.202 | 0.223 | 0.575 | ADMIXTURE |
| 70 | UNK-MAN-07 | 0.072 | 0.641 | 0.288 | 2 |
| 71 | UNK-MAN-08 | 0.210 | 0.483 | 0.307 | ADMIXTURE |
| 72 | UNK-MAN-09 | 0.252 | 0.486 | 0.262 | ADMIXTURE |
| 73 | UNK-MAN-10 | 0.311 | 0.368 | 0.321 | ADMIXTURE |
| 74 | UNK-NES-01 | 0.568 | 0.032 | 0.400 | ADMIXTURE |
| 75 | UNK-NES-02 | 0.164 | 0.696 | 0.140 | 2 |
| 76 | UNK-NES-03 | 0.042 | 0.907 | 0.051 | 2 |
| 77 | UNK-NES-04 | 0.205 | 0.705 | 0.091 | 2 |
| 78 | UNK-NES-05 | 0.053 | 0.154 | 0.793 | 3 |
| 79 | Quvan Margulam | 0.160 | 0.687 | 0.153 | 2 |
| 80 | Shakanda Farm | 0.041 | 0.731 | 0.228 | 2 |
| 81 | Quvan Narmo | 0.645 | 0.179 | 0.176 | 1 |
| 82 | Karpo-Meen | 0.735 | 0.037 | 0.228 | 1 |
| 83 | Gothuroo | 0.033 | 0.812 | 0.155 | 2 |
| 84 | Moti Tilee Chuli Chan | 0.199 | 0.649 | 0.151 | 2 |
| 85 | Tub Chi Chuli | 0.138 | 0.515 | 0.347 | ADMIXTURE |
| 86 | Rakchaykarpo | 0.064 | 0.823 | 0.113 | 2 |
| 87 | KhantayAloo Chuli | 0.144 | 0.647 | 0.209 | 2 |
| 88 | Ston Chuli | 0.425 | 0.192 | 0.383 | ADMIXTURE |
| 89 | Leela Tilee Chuli Chan | 0.039 | 0.183 | 0.778 | 3 |
| 90 | Quvan Narmo Gargard | 0.083 | 0.154 | 0.762 | 3 |
| 91 | Mamorae | 0.268 | 0.296 | 0.436 | ADMIXTURE |
| 92 | Quvan Sanjak | 0.207 | 0.716 | 0.077 | 2 |
| 93 | Peechank Tilee Chulich | 0.041 | 0.845 | 0.114 | 2 |
| 94 | Khantay Gosmin | 0.062 | 0.878 | 0.060 | 2 |
| 95 | Bar Quick | 0.083 | 0.686 | 0.231 | 2 |
| 96 | Shak Chuli | 0.081 | 0.849 | 0.070 | 2 |
| 97 | Aam Chuli | 0.053 | 0.087 | 0.860 | 3 |
| 98 | Nagpo Chuli | 0.133 | 0.531 | 0.336 | ADMIXTURE |
| 99 | Fating Chuli | 0.927 | 0.025 | 0.047 | 1 |
| 100 | Shakanda Khantay | 0.738 | 0.207 | 0.055 | 1 |
| 101 | Khapuck Khantay | 0.797 | 0.151 | 0.053 | 1 |
| 102 | SarQuvan | 0.928 | 0.046 | 0.026 | 1 |
| 103 | Chapa Cha Chuli | 0.865 | 0.103 | 0.032 | 1 |
| 104 | Khantay Khorma Chuli | 0.924 | 0.036 | 0.040 | 1 |
| 105 | Rgasat | 0.824 | 0.11 | 0.065 | 1 |
| 106 | Shakanda Goma Karg | 0.772 | 0.175 | 0.053 | 1 |
| 107 | Nosnpo Chuli | 0.321 | 0.622 | 0.057 | 2 |
| 108 | Badana Narmo | 0.942 | 0.032 | 0.026 | 1 |
| 109 | Chongo Chuli Khantay | 0.737 | 0.08 | 0.184 | 1 |
| 110 | Khaparick Narmo | 0.934 | 0.03 | 0.036 | 1 |
| 111 | Wan Chuli | 0.251 | 0.671 | 0.078 | 2 |
| 112 | Gron Chuli | 0.261 | 0.639 | 0.099 | 2 |
| 113 | Gvan Garmoo | 0.085 | 0.252 | 0.663 | 3 |
| 114 | Quvan Chuli Minji | 0.673 | 0.272 | 0.055 | 1 |
| 115 | Shakanda Mangbor | 0.316 | 0.57 | 0.114 | ADMIXTURE |
| 116 | Punar Gozi | 0.905 | 0.056 | 0.039 | 1 |
| 117 | NarmoSeir | 0.839 | 0.114 | 0.047 | 1 |
| 118 | Zan Chuli Narmo | 0.161 | 0.753 | 0.086 | 2 |
| 119 | Bronginar | 0.366 | 0.161 | 0.473 | ADMIXTURE |
| 120 | Khantay Khorma | 0.395 | 0.567 | 0.038 | ADMIXTURE |

**Table S4:** Genetic differentiation based on *Fst* values between 3 apricot sub-populations identified by population structure analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Sub-population (K)s | 1 | 2 | 3 |
| I | - | 0. 0442 | 0. 0491 |
| II | 0. 0442 | - | 0. 0529 |
| II | 0. 0491 | 0. 0529 | - |

**Table S5:** Expected heterozygosity and Fst value calculated for 3 apricot sub-populations

|  |  |  |
| --- | --- | --- |
| Sub-population (K) | Expected heterozygosity | Fst value |
| I | 0.391 | 0.109 |
| II | 0.306 | 0.192 |
| III | 0.340 | 0.195 |
| Average | 0.345 | 0.165 |