**Table S1: List of germplasm accessions (GAs), Advanced breeding lines (ABLs) and Released varieties (RVs) along with their place of collection/parentage and mean protein content.**

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| **Sl. No.** | **Genotypes** | **Place of collection/ Parentage** | **Protein content (%)** |
| 1 | GL 6 | Tamil Nadu, India | 21.04 |
| 2 | GL 10 | Karnataka, India | 23.28 |
| 3 | GL 12 | Karnataka, India | 21.30 |
| 4 | GL 66 | Karnataka, India | 20.25 |
| 5 | GL 68 | Karnataka, India | 23.70 |
| 6 | GLP 71 | Karnataka, India | 20.34 |
| 7 | GLP 72 | Karnataka, India | 19.95 |
| 8 | GLP 73 | Karnataka, India | 20.29 |
| 9 | GLP 75 | Karnataka, India | 22.53 |
| 10 | GLP 76 | Karnataka, India | 21.64 |
| 11 | GLP 77 | Karnataka, India | 22.90 |
| 12 | GL 80 | Karnataka, India | 21.68 |
| 13 | GL 95 | Unknown | 21.35 |
| 14 | GL 142 | Karnataka, India | 21.44 |
| 15 | GL 147 | Karnataka, India | 21.75 |
| 16 | GL 174 | Karnataka, India | 22.29 |
| 17 | GL 187 | Karnataka, India | 21.32 |
| 18 | GL 191 | Karnataka, India | 22.89 |
| 19 | GL 194 | Karnataka, India | 21.92 |
| 20 | GL 199 | Karnataka, India | 22.68 |
| 21 | GL 201 | Karnataka, India | 21.52 |
| 22 | GL 203 | Maharashtra, India | 22.37 |
| 23 | GL 204 | Andhra Pradesh, India | 20.41 |
| 24 | GL 205 | Karnataka, India | 22.69 |
| 25 | GL 228 | Karnataka, India | 21.72 |
| 26 | GL 232 | Karnataka, India | 22.34 |
| 27 | GL 233 | Karnataka, India | 20.93 |
| 28 | GL 237 | Karnataka, India | 22.23 |
| 29 | GL 238 | Gujarat, India | 21.43 |
| 30 | GL 239 | Gujarat, India | 21.88 |
| 31 | GL 250 | Gujarat, India | 20.31 |
| 32 | GL 252 | Gujarat, India | 23.54 |
| 33 | GL 274 | Gujarat, India | 21.24 |
| 34 | GL 286 | Karnataka, India | 23.34 |
| 35 | GL 289 | Karnataka, India | 20.44 |
| 36 | GL 292 | Karnataka, India | 22.08 |
| 37 | GL 295 | Karnataka, India | 23.30 |
| 38 | GL 304 | Karnataka, India | 21.02 |
| 39 | GL 306 | Karnataka, India | 22.98 |
| 40 | GL 309 | Karnataka, India | 21.73 |
| 41 | GL 320 | Karnataka, India | 22.88 |
| 42 | GL 326 | Karnataka, India | 19.08 |
| 43 | GL 331 | Karnataka, India | 23.74 |
| 44 | GL 332 | Karnataka, India | 20.14 |
| 45 | GL 345 | Karnataka, India | 21.09 |
| 46 | GL 346 | Karnataka, India | 22.87 |
| 47 | GL 349 | Karnataka, India | 22.93 |
| 48 | GL 350 | Karnataka, India | 21.32 |
| 49 | GL 354 | Karnataka, India | 21.39 |
| 50 | GL 355 | Karnataka, India | 20.40 |
| 51 | GL 356 | Karnataka, India | 23.50 |
| 52 | GL 357 | Karnataka, India | 20.22 |
| 53 | GL 360 | Karnataka, India | 20.21 |
| 54 | GL 363 | Karnataka, India | 22.81 |
| 55 | GL 372 | Karnataka, India | 21.34 |
| 56 | GL 376 | Karnataka, India | 20.20 |
| 57 | GL 378 | Karnataka, India | 22.28 |
| 58 | GL 382 | Karnataka, India | 22.78 |
| 59 | GL 385 | Karnataka, India | 22.28 |
| 60 | GL 386 | Karnataka, India | 21.37 |
| 61 | GL 387 | Karnataka, India | 23.10 |
| 62 | GL 391 | Karnataka, India | 21.39 |
| 63 | GL 403 | Karnataka, India | 23.35 |
| 64 | GL 404 | Karnataka, India | 20.67 |
| 65 | GL 410 | Kenya | 22.05 |
| 66 | GL 412 | Kenya | 18.82 |
| 67 | GL 418 | Kenya | 20.17 |
| 68 | GL 419 | Kenya | 23.03 |
| 69 | GL 426 | Kenya | 20.86 |
| 70 | GL 432 | Kenya | 20.10 |
| 71 | GL 434 | Kenya | 24.50 |
| 72 | GL 444 | Unknown | 23.88 |
| 73 | GL 447 | Unknown | 21.94 |
| 74 | GL 449 | Karnataka, India | 20.74 |
| 75 | GL 451 | Karnataka, India | 22.21 |
| 76 | GL 464 | Karnataka, India | 22.19 |
| 77 | GL 470 | Karnataka, India | 22.88 |
| 78 | GL 471 | Karnataka, India | 19.18 |
| 79 | GL 479 | Karnataka, India | 21.51 |
| 80 | GL 506 | Karnataka, India | 20.63 |
| 81 | GL 524 | Karnataka, India | 22.86 |
| 82 | GL 527 | Andhra Pradesh, India | 22.28 |
| 83 | GL 530 | Andhra Pradesh, India | 22.52 |
| 84 | GL 576 | Maharashtra, India | 20.37 |
| 85 | GL 577 | Tamil Nadu, India | 19.15 |
| 86 | GL 579 | Tamil Nadu, India | 22.43 |
| 87 | GL 606 | Unknown | 22.56 |
| 88 | GL 621 | Unknown | 20.04 |
| 89 | GL 626 | Unknown | 23.09 |
| 90 | GL 633 | Unknown | 21.73 |
| 91 | GL 634 | Unknown | 20.89 |
| 92 | GL 640 | Unknown | 23.23 |
| 93 | GL 658 | Karnataka, India | 21.08 |
| 94 | GL 661 | Karnataka, India | 21.51 |
| 95 | Kadalavare | Karnataka, India | 19.52 |
| 96 | KNR local | Kerala, India | 21.74 |
| 97 | FPB 1 | HA 4 × GLB 48 | 22.28 |
| 98 | FPB 5 | HA 4 × GLB 48 | 22.79 |
| 99 | FPB 8 | HA 4 × GLB 48 | 22.82 |
| 100 | FPB 14 | HA 4 × GLB 48 | 21.58 |
| 101 | FPB 15 | HA 4 × GLB 48 | 23.59 |
| 102 | FPB 20 | HA 4 × GLB 48 | 21.58 |
| 103 | FPB 33 | HA 4 × GLB 48 | 22.16 |
| 104 | FPB 34 | HA 4 × GLB 48 | 21.78 |
| 105 | FPB 35 | HA 4 × GLB 48 | 21.43 |
| 106 | FPB 37 | HA 4 × GLB 48 | 21.94 |
| 107 | HA 10-2 | HA 4 × GLB 153 | 22.93 |
| 108 | HA 10-8 | HA 4 × GLB 153 | 21.44 |
| 109 | HA 11-3 | HA 4 × GLB 127 | 20.77 |
| 110 | HA 12-2 | HA 4 × GLB 121 | 20.51 |
| 111 | HA 12-3 | HA 4 × GLB 121 | 20.08 |
| 112 | HA 12-4 | HA 4 × GLB 121 | 23.15 |
| 113 | HA 12-5 | HA 4 × GLB 121 | 23.19 |
| 114 | HA 12-9 | HA 4 × GLB 121 | 22.40 |
| 115 | RIL 3-172 | HA 4 × CPI 31113 | 20.83 |
| 116 | RIL 3-180 | HA 4 × CPI 31113 | 22.39 |
| 117 | HA 3 | HA 1 × US 67 - 31 | 21.23 |
| 118 | HA 4 | HA 3 × Magadi local | 21.12 |
| SEm± | | | 0.11 |
| Critical Difference (CD) @ P=0.01 | | | 0.40 |

Table S2: Estimates of mean and variance for protein content of germplasm accessions and advanced breeding lines classified into different model-based ‘K-means’ clusters in dolichos bean.

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| --- | --- | --- | --- |
| **Clusters** | **Size of the clusters (no. of genotypes)** | **Mean** | **Variance** |
| **C1** | 36 | 21.49 | 0.07 |
| **C2** | 34 | 22.55 | 0.08 |
| **C3** | 26 | 20.41 | 0.08 |
| **C4** | 17 | 23.44 | 0.13 |
| **C5** | 05 | 19.15 | 0.06 |
| **‘F’/ Levene’s statistic** |  | 440.65 | 1.04 |
| **Probability** |  | 1×10-6 | 0.39 |