**Supplementary online material 2:**

**Table S2.** Description of locations used for the evaluation of 225 pearl millet accessions during the 2010 season in Sudan.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Location | Water regime | Longi-tude (dec.) | Lati-tude (dec.) | Alti-tude (m) | Soil type | Soil pH | Rain­fall² (mm) | RH1 (%) | T1 (°C) |
| El Fasher | Rainfed | 25.323 | 13.637 | 710 | Sandy soil | 7.3 | 172.0 | 24.3 | 27.1  |
| El Obeid | Rainfed | 30.290 | 13.126 | 570 | Sandy soil | 6.5–7.4 | 214.8 | 25.2 | 28.0 |
| Wad Medani | Irrigated | 33.483 | 14.381 | 407 | Cracking vertisol | 7.5–8.5 | 206.4 | 28.0 | 29.7 |

1 Mean relative humidity (RH %) and Temperature (T) per year; ²Total amount of rainfall per year.

**Table S3.** Range of variation for Fe, Zn, Ca and Mg in edible tissues of some common field crops.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Crop | Genotypes | Fe(mg kg-1) | Zn(mg kg-1) | Ca(mg kg-1) | Mg(mg kg-1) | Number of genotypes  | Reference |
| Wheat(*Triticum aestivum*) | Bread wheat genotypes | 29 – 57 | 25 – 53 | 250 – 730 | 920 – 1430 |  132 | Graham *et al*. (1999) |
| Triticale(*Triticosecale*) | Selected cultivars | 28 – 36 | 21 – 31 | 350 – 500 | 1200 – 1460 |  10 | Feil and Fossati, (1995) |
| Rice(*Oryza sativa*) | Collected genotypes | 1 – 27 | 13 – 44 | 42 – 342 | 63 – 539 |  274 | Jiang *et al*. (2007) |
| Maize (*Zea mays*) | Core collection | 10 – 63 | 13 – 58 | – | – |  1814 | Bänziger and Long, (2000) |
| Sorghum (*Sorghum bicolor*) | Diverse germ­plasm | 20 – 37 | 13 – 31 | – | – |  84 | Reddy *et al*. (2005) |
| Finger millet (*Eleusine coracana*) | Core collection | 22 – 65 | 17 – 25 | 1840 – 4890 | – |  622 | Upadhyaya *et al*. (2011) |
| Pearl millet (*Pennisetum glaucum*) | Diverse germ­plasm | 30 – 76 | 25 – 65 | – | – |  120 | Velu *et al*. (2007) |
| Bean (*Phaseolus vulgaris*) | Selected genotypes | 48 – 74 | 17 – 28 | 1390 – 2040 | 1470 – 1960 |  8 | Ariza-Nieto *et al*. (2007) |
| Chickpea (*Cicer arietinum*) | Commer­cial cultivars | 24 – 41 | 35 – 60 | 1900 – 2200 | 40 – 50 |  4 | Zia-Ul-Haq *et al*. (2007) |
| Cowpea (*Vigna unguiculata*) | Collected accessions | 34 – 80 | 22 – 58 | 310 – 1395 | 1515 – 2500 |  1541 | Boukar *et al*. (2011) |

**Fig. S1.** Frequency distribution of 225 pearl millet accessions for panicle density, panicle length, plant height and days to 50% flowering.



**Fig. S2.** Box-plots of mean grain Fe content of different color grains of Sudanese pearl millet.



**Fig. S3.** Neighbor-joining tree showing the phenotypic relationship of 225 pearl millet accessions based on 16 agro-morphological traits.