

A core subset of cowpea (*Vigna unguiculata*) accessions representing the collection in the ILRI Forage Genebank

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Report



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Background

The forage genebank at the International Livestock Research Institute (ILRI) conserves over 691 cowpea (*Vigna unguiculata* L.) accessions, forming part of the CGIAR collection of more than 16,000 that represents the largest global collection. This collection exhibits extensive genetic and phenotypic diversity, including forage, grain, and dual-purpose types, as well as early maturing, high-protein, and low-fiber accessions. These genetic resources are critical for breeding programs targeting diverse agro-ecologies and water-limited environments. Cowpea is a key legume in sub-Saharan Africa, valued for its drought tolerance, nutritional benefits, and contribution to soil fertility. In East Africa, particularly Ethiopia, Kenya, Uganda, Tanzania, and Sudan, it serves as a major source of food, income, and livestock feed for smallholder farmers, making it an important climate-smart crop.

Summary

The collections were genotyped using the DArTseq platform, generating genome-wide high-density SNP and SilicoDArT markers, of which 93% of the SNPs and 83% of the SilicoDArTs were successfully mapped to the *V. unguiculata* genome. Based on selected genome-wide SNP markers and passport data, a core subset of 102 accessions (20%) capturing the maximum diversity within the ILRI forage genebank collection was identified (Figure 1; Table 1). This manageable subset can serve as a representative reference set for distribution and evaluation across different agro-ecologies of the world.

Figure 1. Hierarchical clustering with the positions of the selected core subset accessions (highlighted red) across the major clusters and subclusters of the whole collection.

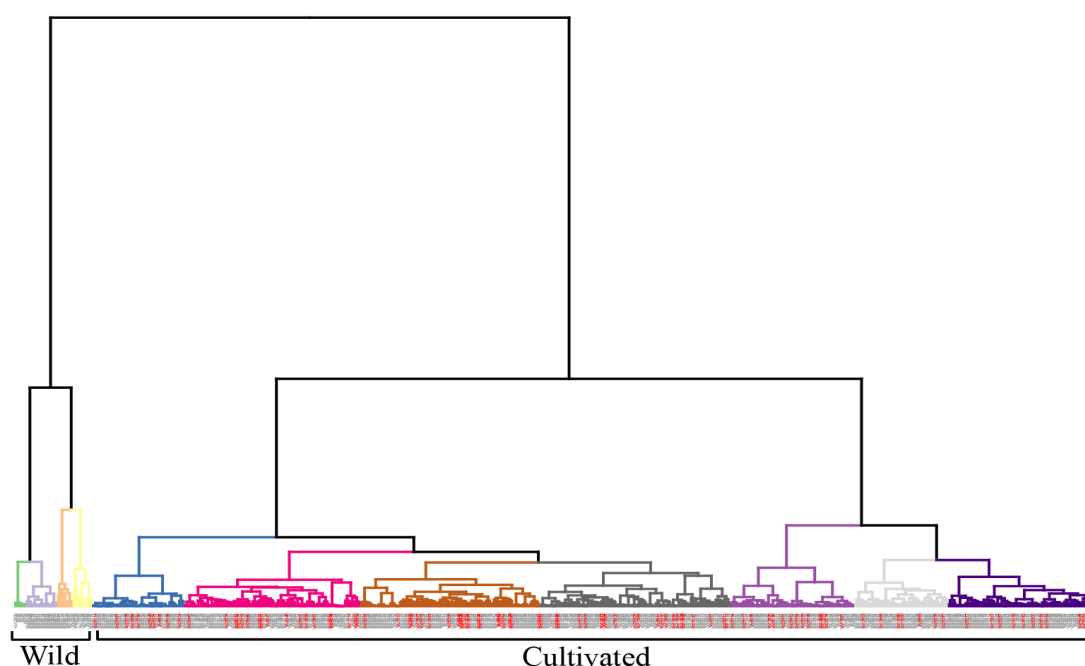


Table 1. The list and detailed information of the identified core subset consisting of 102 cowpea accessions

No.	Accession	Taxon	DOI	Country of origin	Cluster
1	12007	<i>Vigna unguiculata</i>	10.18730/FQXHF	Burkina Faso	1
2	25152	<i>Vigna unguiculata</i>	10.18730/G42X6	NA	1
3	25194	<i>Vigna unguiculata</i>	10.18730/G447B	NA	1
4	25207	<i>Vigna unguiculata</i>	10.18730/G44NS	NA	1
5	25257	<i>Vigna unguiculata</i>	10.18730/G4671	NA	1
6	25270	<i>Vigna unguiculata</i>	10.18730/G46ME	NA	1

7	25277	<i>Vigna unguiculata</i>	10.18730/G46VN	NA	1
8	25458	<i>Vigna unguiculata</i>	10.18730/G4CHJ	NA	1
9	25394	<i>Vigna unguiculata</i>	10.18730/G4AGV	NA	1
10	25100	<i>Vigna unguiculata</i>	10.18730/G419W	NA	1
11	25149	<i>Vigna unguiculata</i>	10.18730/G42T3	Turkey	1
12	25154	<i>Vigna unguiculata</i>	10.18730/G42Z8	NA	1
13	25482	<i>Vigna unguiculata</i>	10.18730/G4D95	NA	1
14	25485	<i>Vigna unguiculata</i>	10.18730/G4DC8	United States	1
15	9338	<i>Vigna unguiculata</i>	10.18730/G7TSZ	India	2
16	11991	<i>Vigna unguiculata</i>	10.18730/FQWY~	NA	2
17	12645	<i>Vigna unguiculata</i>	10.18730/FRGR1	NA	2
18	25218	<i>Vigna unguiculata</i>	10.18730/G450U	NA	2
19	11988	<i>Vigna unguiculata</i>	10.18730/FQWTX	South Africa	2
20	25130	<i>Vigna unguiculata</i>	10.18730/G427N	NA	2
21	25117	<i>Vigna unguiculata</i>	10.18730/G41T8	NA	2
22	12870	<i>Vigna unguiculata</i>	10.18730/FRQS4	Kenya	2
23	25144	<i>Vigna unguiculata</i>	10.18730/G42N=	NA	2
24	25451	<i>Vigna unguiculata</i>	10.18730/G4CAB	India	2
25	9357	<i>Vigna unguiculata</i>	10.18730/G7VDE	NA	3
26	12635	<i>Vigna unguiculata</i>	10.18730/FRGDV	Philippines	3
27	12691	<i>Vigna unguiculata</i>	10.18730/FRJ9D	NA	3
28	9653	<i>Vigna unguiculata</i>	10.18730/G7Z5Q	Cameroon	3
29	12000	<i>Vigna unguiculata</i>	10.18730/FQXA8	South Africa	3
30	12668	<i>Vigna unguiculata</i>	10.18730/FRHGS	NA	3
31	11113	<i>Vigna unguiculata</i>	10.18730/FQ1MA	Nigeria	3
32	12002	<i>Vigna unguiculata</i>	10.18730/FQXCA	Mali	3
33	11989	<i>Vigna unguiculata</i>	10.18730/FQWVY	South Africa	3
34	25211	<i>Vigna unguiculata</i>	10.18730/G44SX	Papua New Guinea	3
35	25231	<i>Vigna unguiculata</i>	10.18730/G45DC	NA	3
36	25278	<i>Vigna unguiculata</i>	10.18730/G46WP	NA	3
37	25275	<i>Vigna unguiculata</i>	10.18730/G46SK	NA	3
38	25287	<i>Vigna unguiculata</i>	10.18730/G475Z	NA	3
39	9349	<i>Vigna unguiculata</i>	10.18730/G7V45	NA	4
40	25387	<i>Vigna unguiculata</i>	10.18730/G4A9M	NA	4
41	25481	<i>Vigna unguiculata</i>	10.18730/G4D84	Myanmar	4
42	25396	<i>Vigna unguiculata</i>	10.18730/G4AJX	NA	4
43	9648	<i>Vigna unguiculata</i>	10.18730/G7Z0J	Senegal	4
44	12740	<i>Vigna unguiculata</i>	10.18730/FRKZY	NA	4
45	25108	<i>Vigna unguiculata</i>	10.18730/G41HU	NA	4
46	25114	<i>Vigna unguiculata</i>	10.18730/G41Q5	NA	4

47	25340	<i>Vigna unguiculata</i>	10.18730/G48TA	NA	4
48	25375	<i>Vigna unguiculata</i>	10.18730/G49X8	NA	4
49	25379	<i>Vigna unguiculata</i>	10.18730/G4A1C	NA	4
50	11996	<i>Vigna unguiculata</i>	10.18730/FQX31	South Africa	5
51	11998	<i>Vigna unguiculata</i>	10.18730/FQX53	South Africa	5
52	9333	<i>Vigna unguiculata</i>	10.18730/G7TMT	United States	5
53	11977	<i>Vigna unguiculata</i>	10.18730/FQWEH	South Africa	5
54	11976	<i>Vigna unguiculata</i>	10.18730/FQWDG	South Africa	5
55	12659	<i>Vigna unguiculata</i>	10.18730/FRH6F	NA	5
56	9341	<i>Vigna unguiculata</i>	10.18730/G7TX=	NA	5
57	9645	<i>Vigna unguiculata</i>	10.18730/G7YXF	Mali	5
58	11990	<i>Vigna unguiculata</i>	10.18730/FQWX*	South Africa	5
59	12664	<i>Vigna unguiculata</i>	10.18730/FRHCN	NA	5
60	12005	<i>Vigna unguiculata</i>	10.18730/FQXFD	Niger	5
61	12724	<i>Vigna unguiculata</i>	10.18730/FRKDC	NA	5
62	25167	<i>Vigna unguiculata</i>	10.18730/G43CN	South Africa	5
63	25185	<i>Vigna unguiculata</i>	10.18730/G43Y2	Nigeria	5
64	25274	<i>Vigna unguiculata</i>	10.18730/G46RJ	NA	5
65	25253	<i>Vigna unguiculata</i>	10.18730/G463\$	NA	5
66	25283	<i>Vigna unguiculata</i>	10.18730/G471V	NA	5
67	25303	<i>Vigna unguiculata</i>	10.18730/G47NA	NA	5
68	25410	<i>Vigna unguiculata</i>	10.18730/G4B17	NA	5
69	25420	<i>Vigna unguiculata</i>	10.18730/G4BBH	NA	5
70	25403	<i>Vigna unguiculata</i>	10.18730/G4AT0	NA	5
71	25426	<i>Vigna unguiculata</i>	10.18730/G4BHQ	NA	5
72	25290	<i>Vigna unguiculata</i>	10.18730/G478\$	NA	5
73	25490	<i>Vigna unguiculata</i>	10.18730/G4DHD	NA	5
74	25415	<i>Vigna unguiculata</i>	10.18730/G4B6C	NA	6
75	12684	<i>Vigna unguiculata</i>	10.18730/FRJ15	NA	6
76	9347	<i>Vigna unguiculata</i>	10.18730/G7V23	NA	6
77	9346	<i>Vigna unguiculata</i>	10.18730/G7V12	NA	6
78	9350	<i>Vigna unguiculata</i>	10.18730/G7V67	NA	6
79	9342	<i>Vigna unguiculata</i>	10.18730/G7TYU	Nigeria	6
80	9355	<i>Vigna unguiculata</i>	10.18730/G7VBC	NA	6
81	25374	<i>Vigna unguiculata</i>	10.18730/G49W7	NA	6
82	25128	<i>Vigna unguiculata</i>	10.18730/G425K	NA	6
83	12683	<i>Vigna unguiculata</i>	10.18730/FRJ04	NA	6
84	25126	<i>Vigna unguiculata</i>	10.18730/G423H	NA	6
85	25080	<i>Vigna unguiculata</i>	10.18730/G40N8	NA	6
86	25244	<i>Vigna unguiculata</i>	10.18730/G45TS	NA	6
87	25215	<i>Vigna unguiculata</i>	10.18730/G44X~	NA	6

88	25372	<i>Vigna unguiculata</i>	10.18730/G49T5	NA	6
89	25382	<i>Vigna unguiculata</i>	10.18730/G4A4F	NA	6
90	25301	<i>Vigna unguiculata</i>	10.18730/G47K8	NA	6
91	25318	<i>Vigna unguiculata</i>	10.18730/G484S	NA	6
92	25462	<i>Vigna unguiculata</i>	10.18730/G4CNP	NA	6
93	25463	<i>Vigna unguiculata</i>	10.18730/G4CPQ	NA	6
94	12647	<i>Vigna unguiculata</i>	10.18730/FRGT3	NA	6
95	25424	<i>Vigna unguiculata</i>	10.18730/G4BFN	NA	6
96	7212	<i>Vigna unguiculata</i>	10.18730/G69D5	NA	6
97	25334	<i>Vigna unguiculata</i>	10.18730/G48M4	NA	6
98	11114	<i>Vigna unguiculata</i>	10.18730/FQ1NB	NA	6
99	25121	<i>Vigna unguiculata</i>	10.18730/G41YC	NA	6
100	25137	<i>Vigna unguiculata</i>	10.18730/G42EW	NA	6
101	25254	<i>Vigna unguiculata</i>	10.18730/G464=	NA	6
102	25370	<i>Vigna unguiculata</i>	10.18730/G49R3	NA	6



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