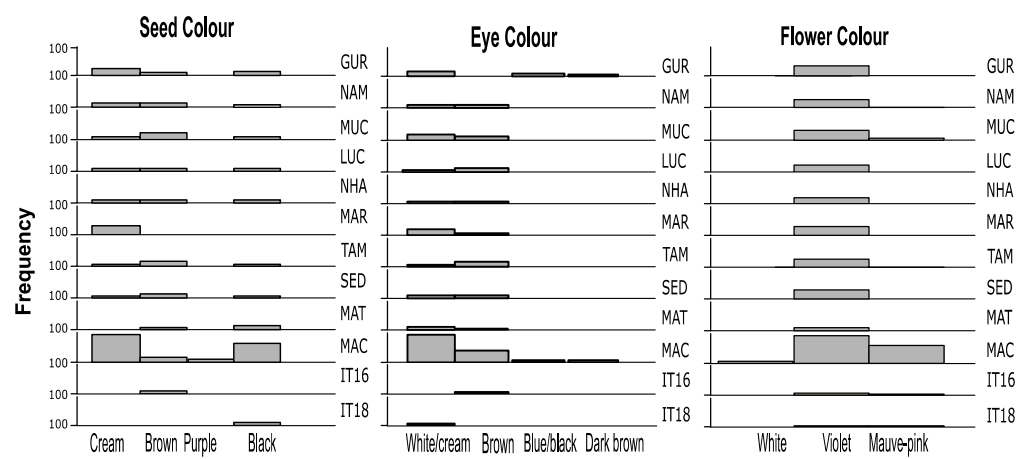


**Figure S1.** Frequency plots for the qualitative traits measured in the 610 analyzed specimens of *Vigna unguiculata*, collected in 10 landraces, and the two commercial varieties. Names of landraces follow Table 1.



**Table S1.** Characterization of the 34 Bioversity International cowpea descriptors used to assess morphological variation in *Vigna unguiculata*.

ID	COWPEA DESCRIPTORS	GRADING SCALE
	<b>SEED</b>	
1	Seed shape	1: Kidney, 2: Ovoid, 3: Crowder, 4: Globose, 5: Rhomboid
2	Seed colour	1: White, 2: Cream, 3: Brown, 4: Red, 5: Purple, 6: Black, 9: Other
3	Testa texture	1: Smooth, 3: Smooth to Rough, 5: Rough (fine reticulation), 7: Rough to wrinkled, 9: Wrinkled (coarse folds on the testa)
4	Eye pattern	0: Absent A, 1: Very Small A, 2: Kabba group, 3: Narrow eye, 4: Small eye, 5: Holstein group, 6: Watson group, 7: Self-coloured, 8: Other
5	Eye colour	0: Eye absent (white, cream), 1: Brown splash or grey, 2: Tan Brown, 3: Red, 4: Green, 5: Blue to black, 6: Blue to black spots or mottle, 7: Speckled (even distribution of fine speckling), 8: Mottled (dark brown pigment typically absent around hilum), 9: Mottled and speckled (Victor), 10: Other
6	Seed length (mm)	Mean of 10 mature seeds excluding those from the extremities of pods
7	Seed width (mm)	Mean width from hilum to keel of the 10 seeds measured for length
8	Seed thickness (mm)	Mean thickness of the 10 seeds measured for length; measured perpendicular to length and width
9	Seed weight (mg)	Weight of 100 seeds moisture content 12%
	<b>VEGETATIVE</b>	
10	Hypocotyl length (mm)	Mean of 10 plants
11	Leaf colour	3: Pale Green, 5: Intermediate green, 7: Dark green
12	Leaf texture	1: Cariaceous, 2: Intermediate, 3: Membranous
13	Leaf marking	Presence/absence of V-mark on leaflets: 0: Absent, 1: Present
14	Terminal leaflet shape	Measured 6 weeks after sowing: 1: Globose, 2: Sub-globose, 3: Sub-hastate, 4: Hastate
15	Terminal leaflet length (mm)	Terminal leaflet whose shape was recorded
16	Terminal leaflet width (mm)	The widest dimension of the terminal leaflets whose shape was recorded
17	Number of main branches	Mean of 10 randomly selected plants: recorded 8 <sup>th</sup> weeks after sowing
18	Number of nodes on main stem	Mean of 10 randomly selected plants: recorded 3-4 weeks after sowing

19	Stipule width (mm)	
20	Stipule length (mm)	
21	Growth habit	1: Determinate, 2: Indeterminate bush, 3: Indeterminate spreading not climbing, 4: Indeterminate twining and climbing, 5: Other
22	Twinning tendency	0: None, 3: Slight, 5: Intermediate, 7: Pronounced
23	Plant pigmentation	0: None, 1: Very slight, 3: Moderate at the base and tips of petioles, 5: Intermediate, 7: Extensive, 9: Solid
24	Plant hairiness	3: Glabrescent, 5: Short appressed hairs, 7: Pubescent to hirsute
25	Plant vigour	3: Non-vigorous, 5: Intermediate, 7: vigorous, 9: very vigorous
26	Plant height (mm)	
27	Plant diameter (mm)	
28	Stem diameter (mm)	
<b>PEST AND DISEASE SUSCEPTIBILITY</b>		
29	Early pest incidence	Scored for natural infestation on a 1-5 scale, where 1 – non infested, 2-Low infestation, 3-moderately infested, 5-High susceptibility
30	Early rust incidence	Scored for natural infection on a 1-5 scale, where 1 – non-susceptible, 3-moderate, 5-High susceptibility
<b>INFLORESCENCE AND FRUIT</b>		
31	Flowering pigment pattern	0: Not pigmented (white), 1: Wing pigmented, 2: Pigmented margins on wing and standard, 3: Wing pigmented, 4: Wing with pigmented upper margin, 5: Completely pigmented, 6: Other
32	Flower colour	1: White, 2: Violet, 3: Mauve–pink, 4: Other
33	Days to flowering	From sowing to the stage when 50% of plants have begun flowering
34	Days to first mature pods	From sowing to the stage when 50% of plants have mature pods