frontiers | Frontiers in Sustainable Food Systems

TYPE Correction
PUBLISHED 26 July 2022
DOI 10.3389/fsufs.2022.986734

OPEN ACCESS

EDITED AND REVIEWED BY
Uma Tiwari,
Technological University
Dublin, Ireland

*CORRESPONDENCE
Rakesh Bhardwaj
rakesh.bhardwaj1@icar.gov.in

SPECIALTY SECTION
This article was submitted to Nutrition and Sustainable Diets, a section of the journal Frontiers in Sustainable Food Systems

RECEIVED 05 July 2022
ACCEPTED 12 July 2022
PUBLISHED 26 July 2022

CITATION
Padhi SR, Bartwal A, John R, Tripathi K, Gupta K, Wankhede DP, Mishra GP, Kumar S, Archak S and Bhardwaj R (2022) Corrigendum: Evaluation and multivariate analysis of cowpea [*Vigna unguiculata* (L.) walp] germplasm for selected nutrients—mining for nutri-dense accessions. *Front. Sustain. Food Syst.* 6:986734. doi: 10.3389/fsufs.2022.986734

Corrigendum: Evaluation and multivariate analysis of cowpea [*Vigna unguiculata* (L.) walp] germplasm for selected nutrients—mining for nutri-dense accessions

Siddhant Ranjan Padhi[1], Arti Bartwal[2], Racheal John[2], Kuldeep Tripathi[2], Kavita Gupta[2], Dhammaprakash Pandhari Wankhede[2], Gyan Prakash Mishra[1], Sanjeev Kumar[3], Sunil Archak[2] and Rakesh Bhardwaj[2]*

[1]ICAR-Indian Agricultural Research Institute, New Delhi, India, [2]Indian Council of Agricultural Research (ICAR)-National Bureau of Plant Genetic Resources, New Delhi, India, [3]ICAR-Indian Agricultural Statistics Research Institute, New Delhi, India

KEYWORDS

legumes, nutritional profiling, diversity, HCA, PCA, NIRS assisted sample selection

A corrigendum on

Evaluation and Multivariate Analysis of Cowpea [*Vigna unguiculata* (L.) Walp] Germplasm for Selected Nutrients—Mining for Nutri-Dense Accessions

by Padhi, S. R., Bartwal, A., John, R., Tripathi, K., Gupta, K., Wankhede, D. P., Mishra, G. P., Kumar, S., Archak, S., and Bhardwaj, R. (2022). Front. Sustain. Food Syst. 6:888041. doi: 10.3389/fsufs.2022.888041

A correction has been made to **Abstract**. This sentence previously stated:

"Some nutri-dense accessions were identified from the above-mentioned clusters, such as EC170579 and EC201086 with high protein (>27%), TSS, amylose, and TDF content."

The corrected sentence appears below:

"Some nutri-dense accessions were identified from the above-mentioned clusters, such as EC169879 and IC201086 with high protein (>27%), TSS, amylose, and TDF content."

A correction has been made to **Results and Discussion**, "*Nutritional Analysis*;" "*Total Protein Content*," Paragraph 1. This sentence previously stated:

"Moreover, a good crop improvement program could be conducted by selecting promising accessions, including EC390248 (27.9%), EC170579 (27.7%), and EC240667 (26.6%), from our study."

10.3389/fsufs.2022.986734

The corrected sentence appears below:

"Moreover, a good crop improvement program could be conducted by selecting promising accessions, including EC390248 (27.9%), EC169879 (27.7%), and EC240667 (26.6%), from our study."

A correction has been made to **Results and Discussion**, "*Statistical Analysis*;" "*Hierarchical Clustering Analysis*," Paragraph 3. This sentence previously stated:

"Some nutri-dense accessions have been found that can be used in different areas of the food industry and crop improvement programs. EC170579 and EC201086 (cluster V) have high protein, TSS, amylose, and TDF with low starch content."

The corrected sentence appears below:

"Some nutri-dense accessions have been found that can be used in different areas of the food industry and crop improvement programs. EC169879 and IC201086 (cluster V) have high protein, TSS, amylose, and TDF with low starch content."

In the published article, there was an error in Supplementary Table 1. The accession numbers have been changed from EC170579 to EC169879 (serial no. 12) and EC201086 to IC201086 (serial no. 68). The correct Supplementary Table 1 and its caption "Nutritional composition of 120 cowpea germplasm, Values expressed as mean ± standard deviation" appear below.

The authors apologize for these errors and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.

Publisher's note

10.3389/fsufs.2022.986734

SUPPLEMENTARY TABLE 1 Nutritional composition of 120 cowpea germplasm, values expressed as mean ± standard deviation.

Serial No	Accession No	Phytic Acid (g/100g)	Starch (g/100g)	TSS (g/100g)	Phenols (g/100g)	Protein (g/100g)	TDF (g/100g)	Amylose (g/100g)
1	IC 202885	0.968±0.04	29.84±1.08	7.17±0.26	0.61±0.02	25.01±0.91	15.49±0.56	15.43±0.56
2	EC 149303	1.174±0.03	31.62±0.88	8.73±0.24	0.33±0.01	24.03±0.67	15.94±0.44	17.37±0.48
3	EC 240630	0.971±0.04	33.23±1.35	4.84±0.2	0.28±0.01	23.34±0.95	15.66±0.64	12.44±0.5
4	IC 201092	1.056±0.04	30.85±1.25	4.62±0.19	0.31±0.01	24.21±0.98	15.16±0.61	15.57±0.63
5	EC 724690	0.931±0.03	36.66±1.38	7.33±0.28	0.13±0	21.59±0.81	13.68±0.51	18±0.68
6	EC 724033	1.023±0.04	34.18±1.22	5.81±0.21	0.41±0.01	23.68±0.85	20.1±0.72	12.38±0.44
7	EC 149314	0.866±0.04	35.34±1.53	6.59±0.29	0.14±0.01	22.09±0.96	15.45±0.67	19.98±0.87
8	EC 240937	0.91±0.04	31.49±1.5	6.5±0.31	0.39±0.02	24.23±1.15	19.59±0.93	15.87±0.76
9	EC 240900	1.177±0.06	32.44±1.67	5.44±0.28	0.3±0.02	23.93±1.23	15.21±0.78	17.16±0.88
10	EC 240741	1.176±0.04	32.41±1.21	5.87±0.22	0.23±0.01	24.1±0.9	18.89±0.7	12.1±0.45
11	EC 390252	1.136±0.06	32.1±1.65	6.31±0.32	0.34±0.02	23.99±1.23	18.03±0.93	16.61±0.85
12	EC 169879	1.111±0.06	29.82±1.54	5.59±0.29	0.24±0.01	27.72±1.43	19.47±1.01	17.25±0.89
13	EC 201098	1.022±0.05	30.17±1.57	4.66±0.24	0.38±0.02	24.46±1.27	17.59±0.92	17.71±0.92
14	EC 390293	1.37±0.07	28.01±1.44	5.79±0.3	0.28±0.01	26.49±1.36	17.21±0.88	14.1±0.72
15	EC 390212	1.17±0.04	33.24±1.05	6.09±0.19	0.17±0.01	24.35±0.77	18.75±0.59	17.57±0.56
16	IC 249593	1.068±0.05	31.96±1.64	4.77±0.24	0.37±0.02	24.82±1.27	18.96±0.97	19±0.98
17	IC 039747	1.184±0.06	35.18±1.67	8.57±0.41	0.37±0.02	24.49±1.16	18.29±0.87	13.28±0.63
18	EC 101977	1.192±0.04	32.47±1.22	5.57±0.21	0.48±0.02	24.91±0.94	16.54±0.62	12.28±0.46
19	EC 001957	1.076±0.05	31.62±1.41	6.43±0.29	0.61±0.03	22.24±0.99	18.05±0.81	16.91±0.76
20	EC 240697	0.797±0.03	32.35±1.21	6.15±0.23	0.47±0.02	23.25±0.87	14.49±0.54	16.99±0.64
21	EC 398755	0.998±0.03	31.83±1	4.88±0.15	0.27±0.01	22.46±0.7	17.04±0.53	13.7±0.43
22	EC 240900 (A)	1.085±0.04	31.22±1.12	6.76±0.24	0.22±0.01	24.8±0.89	14.76±0.53	10.02±0.36
23	EC 002790	1.003±0.04	33.89±1.26	6.81±0.25	0.47±0.02	22.9±0.85	17.12±0.64	16.41±0.61
24	EC 001958	0.835±0.03	34.62±1.29	5.32±0.2	0.24±0.01	23.96±0.89	19.69±0.73	12.9±0.48
25	EC 109112	1.154±0.04	32.63±1.22	4.5±0.17	0.83±0.03	25.3±0.94	14.39±0.54	15.48±0.58
26	IC 201097	1.107±0.05	30.91±1.46	5.76±0.27	0.26±0.01	20.12±0.95	16.94±0.8	15.93±0.75
27	EC 724358	1.229±0.06	32.6±1.68	6.8±0.35	0.2±0.01	22.12±1.14	16.95±0.87	11.61±0.6
28	EC 723909	1.132±0.04	36.63±1.37	5.15±0.19	0.34±0.01	22.56±0.84	19.91±0.74	13.6±0.51
29	EC 240627	1.108±0.04	30.82±1.17	4.57±0.17	0.2±0.01	24.34±0.92	16.76±0.64	17.96±0.68
30	EC 725103	1.121±0.06	31.31±1.61	2.98±0.15	0.43±0.02	24.73±1.27	20.5±1.05	16.41±0.84
31	IC 202926	1.161±0.04	31.1±1.16	5.21±0.19	0.15±0.01	25.68±0.96	17.27±0.64	15.89±0.59
32	IC 201079	0.981±0.04	30.06±1.29	5.52±0.24	0.26±0.01	26.17±1.12	15.56±0.67	13.55±0.58
33	IC 214833	1.129±0.04	30.22±1.01	6.35±0.21	0.29±0.01	25.43±0.85	16.88±0.56	16.46±0.55
34	EC 240665	0.868±0.05	33.59±1.75	5.32±0.28	0.44±0.02	21.38±1.11	16.16±0.84	15.72±0.82
35	NC 44746	1.203±0.04	32.84±1.1	7.53±0.25	0.28±0.01	24.44±0.82	13.81±0.46	14.84±0.5
36	EC 240808	0.838±0.03	31.3±1.17	6.59±0.25	0.34±0.01	22.96±0.86	16.12±0.61	19.28±0.72
37	IC 201085	0.904±0.03	29.99±1.14	6.61±0.25	0.21±0.01	24.32±0.92	16.11±0.61	15.98±0.61
38	EC 240663	0.882±0.04	37.51±1.89	8.16±0.41	0.34±0.02	22.7±1.14	14.28±0.72	12.54±0.63
39	IC 201081	1.055±0.03	30.68±1	6.35±0.21	0.27±0.01	24.79±0.81	16.32±0.53	15.89±0.52
40	IC 402161	1.402±0.05	32.58±1.21	7.19±0.27	0.12±0	24.24±0.9	17.79±0.66	13.38±0.5
41	EC 004218	0.81±0.03	33.65±1.25	8.45±0.31	0.41±0.02	22.93±0.85	15.58±0.58	18.22±0.68
42	IC 214751	1.063±0.05	29.79±1.41	4.85±0.23	0.16±0.01	26.43±1.25	16.97±0.8	15.97±0.76
43	EC 240667	1.198±0.06	28.43±1.35	7.47±0.36	0.5±0.02	26.55±1.26	16.3±0.78	13.09±0.62
44	EC 240829	1.044±0.05	32.65±1.68	7.82±0.4	0.23±0.01	23.65±1.22	17.44±0.9	15.46±0.8
45	EC 390223	0.993±0.04	32.45±1.2	4.53±0.17	0.4±0.01	24.28±0.9	16.19±0.6	17.7±0.66
46	IC 259106	1.102±0.04	30.61±1.15	5.96±0.22	0.31±0.01	24.07±0.9	18.87±0.71	15.38±0.58

(Continued)

10.3389/fsufs.2022.986734

SUPPLEMENTARY TABLE 1 Continued

Serial No	Accession No	Phytic Acid (g/100g)	Starch (g/100g)	TSS (g/100g)	Phenols (g/100g)	Protein (g/100g)	TDF (g/100g)	Amylose (g/100g)
47	EC 240636	1.071±0.03	34.18±0.82	6.54±0.16	0.31±0.01	21.43±0.51	14.47±0.35	15.52±0.37
48	EC 724674	0.894±0.03	37.75±1.41	7.35±0.27	0.03±0	24.11±0.9	19.66±0.73	19.36±0.72
49	IC 257446	0.921±0.03	32.41±1.16	7.57±0.27	0.36±0.01	22.81±0.82	17.11±0.61	19.26±0.69
50	IC 214752	1.222±0.03	27.49±0.64	6.36±0.15	0.37±0.01	25.66±0.6	16.35±0.38	12.71±0.3
51	IC 091522	1.286±0.05	33.01±1.18	3.5±0.13	0.15±0.01	24.31±0.87	18.78±0.67	16.4±0.59
52	EC 724555	1.096±0.05	36.12±1.61	3.71±0.17	0.12±0.01	22.39±1	16±0.71	16.02±0.71
53	EC 390268	1.376±0.05	34.73±1.16	6.1±0.2	0.2±0.01	24.57±0.82	17.1±0.57	11.71±0.39
54	EC 244389	1.016±0.04	32.52±1.16	5.58±0.2	0.3±0.01	22.68±0.81	14.96±0.53	15.89±0.57
55	EC 101928	1.346±0.03	29.44±0.69	5.46±0.13	0.46±0.01	26.21±0.61	15.43±0.36	16.86±0.39
56	IC 257453	1.379±0.05	32.44±1.08	4.46±0.15	0.3±0.01	23.85±0.79	20.59±0.69	13.2±0.44
57	IC 249141	1.081±0.05	30.62±1.44	4.77±0.22	0.51±0.02	25.58±1.2	16.96±0.8	9.65±0.45
58	EC 723996	1.03±0.02	33.14±0.77	5.45±0.13	0.26±0.01	23.25±0.54	19.16±0.45	14.22±0.33
59	EC 723646	1.103±0.04	33.9±1.21	5.06±0.18	0.23±0.01	21.65±0.77	19.21±0.69	11.66±0.42
60	EC 240639	1.075±0.03	33.19±1.03	5.9±0.18	0.27±0.01	23.11±0.72	15.58±0.48	15.29±0.48
61	EC 724681	0.93±0.02	42.74±0.93	4.46±0.1	0.03±0	19.35±0.42	16.15±0.35	17.56±0.38
62	EC 244121	1.107±0.04	32.3±1.21	4.85±0.18	0.35±0.01	23.17±0.87	17.25±0.65	19.24±0.72
63	EC 240908	1.114±0.04	35.58±1.28	4.63±0.17	0.08±0	23.05±0.83	15.33±0.55	18.36±0.66
64	NC 097838	1.278±0.05	29.6±1.07	6.29±0.23	0.35±0.01	26.27±0.95	18.01±0.65	15.57±0.56
65	EC 724439	1.085±0.02	32.8±0.7	6.53±0.14	0.33±0.01	23.18±0.5	18.43±0.4	18.07±0.39
66	EC 101943	1.197±0.04	29.42±0.98	5.53±0.18	0.41±0.01	25.69±0.85	19.86±0.66	16.2±0.54
67	EC 472284	1.165±0.03	36.07±0.79	5.54±0.12	0.09±0	22.25±0.49	17.97±0.39	21.67±0.47
68	IC 201086	1.152±0.05	28.69±1.28	6.21±0.28	0.38±0.02	27.44±1.22	16.9±0.75	19.2±0.86
69	IC 202717	1.19±0.04	31.04±1.16	6.6±0.25	0.38±0.01	26.02±0.98	14.85±0.56	17.83±0.67
70	EC 240900 (B)	1.258±0.03	32.1±0.7	4.33±0.09	0.35±0.01	23.46±0.51	17.88±0.39	13.3±0.29
71	IC 202775	1.164±0.05	33.4±1.44	5.15±0.22	0.14±0.01	24.94±1.07	16.58±0.71	11.71±0.5
72	EC 052085	1.146±0.05	33.81±1.46	4.08±0.18	0.38±0.02	21.39±0.92	17.04±0.74	15.58±0.67
73	EC 390248	1.043±0.04	32.33±1.38	5.36±0.23	0.24±0.01	27.89±1.19	18.32±0.78	15.47±0.66
74	EC 724051	1.026±0.04	34.63±1.25	6.91±0.25	0.12±0	24.53±0.89	19.38±0.7	10.94±0.4
75	EC 367678	1.229±0.06	31.41±1.45	5.53±0.25	0.14±0.01	24.99±1.15	18.81±0.87	11.72±0.54
76	EC 244074	1.263±0.05	31.38±1.14	6.08±0.22	0.27±0.01	24.32±0.88	16.24±0.59	14.8±0.54
77	NC 033267	1.092±0.04	32.5±1.18	4.76±0.17	0.27±0.01	24.08±0.87	18.62±0.68	13.64±0.49
78	IC 202814	1.403±0.04	32.12±0.86	6.13±0.16	0.17±0	24.66±0.66	16.82±0.45	12.41±0.33
79	EC 000455	0.922±0.03	34.3±1.23	3.65±0.13	0.17±0.01	23.86±0.86	17±0.61	14.56±0.52
80	EC 244206	1.019±0.04	34.06±1.4	3.14±0.13	0.2±0.01	23.59±0.97	18.86±0.77	17.63±0.72
81	EC 101970	1.878±0.08	33.17±1.46	3.95±0.17	0.43±0.02	23.38±1.03	20.85±0.92	15.36±0.68
82	EC 149525	1.155±0.04	36.29±1.31	6.79±0.24	0.21±0.01	21.88±0.79	18.97±0.68	15.23±0.55
83	IC 257428	1.323±0.04	32.56±1.09	2.88±0.1	0.27±0.01	24.15±0.81	16.9±0.57	18.82±0.63
84	EC 724556	1.062±0.04	33.38±1.2	4.64±0.17	0.09±0	24.66±0.89	18.15±0.65	13.97±0.5
85	IC 202813	1.236±0.06	28.94±1.3	4.65±0.21	0.19±0.01	25.55±1.14	15.16±0.68	15.22±0.68
86	EC 390257	1.053±0.05	33.09±1.47	5.33±0.24	0.22±0.01	23.38±1.04	18.35±0.82	11.01±0.49
87	EC 390225	0.841±0.03	35.54±1.29	5.56±0.2	0.13±0	24.07±0.87	15.25±0.55	16.4±0.6
88	EC 244138	1.357±0.05	34.18±1.24	5.13±0.19	0.22±0.01	21.17±0.77	21.08±0.76	16.36±0.59
89	EC 390278	1.282±0.03	29.01±0.62	5.07±0.11	0.24±0.01	25.56±0.55	19.71±0.42	14.1±0.3
90	EC 240662	0.981±0.03	33.82±1.12	5.47±0.18	0.16±0.01	26.38±0.88	15.7±0.52	16.07±0.53
91	EC 723788	0.994±0.02	30.67±0.67	4.64±0.1	0.17±0	24.47±0.53	16.61±0.36	17.52±0.38
92	EC 724385	1.095±0.05	34.05±1.52	1.3±0.06	0.1±0	22.93±1.02	15.62±0.7	13.04±0.58

(Continued)

10.3389/fsufs.2022.986734

SUPPLEMENTARY TABLE 1 Continued

Serial No	Accession No	Phytic Acid (g/100g)	Starch (g/100g)	TSS (g/100g)	Phenols (g/100g)	Protein (g/100g)	TDF (g/100g)	Amylose (g/100g)
93	EC 390263	1.366±0.05	32.72±1.23	5±0.19	0.13±0	26.42±0.99	18.09±0.68	14.92±0.56
94	EC 243940	1.062±0.02	32.21±0.7	6.46±0.14	0.19±0	24.16±0.53	17.55±0.38	19.09±0.42
95	EC 390210	1.405±0.06	33.23±1.43	4.78±0.21	0.31±0.01	24.54±1.06	18.16±0.78	11.18±0.48
96	IC 219872	1.223±0.05	29.54±1.28	8.21±0.35	0.18±0.01	25.81±1.11	18.6±0.8	13.3±0.57
97	EC 240652	1.062±0.05	32.28±1.38	4.49±0.19	0.12±0.01	22.99±0.98	20.3±0.87	16.05±0.68
98	EC 240740	1.121±0.04	32.5±1.18	3.49±0.13	0.1±0	23.13±0.84	17.47±0.63	15.13±0.55
99	EC 101987	1.25±0.06	33.97±1.56	7.1±0.33	0.08±0	24.59±1.13	19.75±0.91	19.93±0.92
100	IC 201075	1.404±0.05	33.73±1.22	7.38±0.27	0.11±0	23.7±0.86	16.43±0.6	15.83±0.57
101	IC 214752	1.147±0.04	30.7±1.11	5.15±0.19	0.24±0.01	26.33±0.95	18.19±0.66	10.75±0.39
102	EC 244211	0.889±0.02	33.8±0.91	6.7±0.18	0.23±0.01	24.51±0.66	19.4±0.52	16.29±0.44
103	EC 723744	1.114±0.04	33.04±1.19	8.14±0.29	0.81±0.03	21.49±0.77	17.87±0.64	13.96±0.5
104	IC 201082	1.029±0.04	32.99±1.35	6.43±0.26	0.38±0.02	25.5±1.04	17.79±0.73	16.54±0.68
105	IC 259083	1.107±0.05	31.19±1.37	6.07±0.27	0.28±0.01	24.89±1.1	17.23±0.76	16.92±0.75
106	IC 128727	1±0.04	33.33±1.2	7.55±0.27	0.2±0.01	23.02±0.83	17.91±0.64	21.43±0.77
107	EC 240940	0.926±0.03	32.77±1.1	3.81±0.13	0.37±0.01	23.46±0.78	18.3±0.61	17.95±0.6
108	EC 390259	1.109±0.04	32.07±1.15	2.82±0.1	0.35±0.01	24.22±0.87	16.76±0.6	16.18±0.58
109	EC 101913	1.224±0.05	32.85±1.47	6.93±0.31	0.26±0.01	24.56±1.1	16.54±0.74	16.46±0.74
110	EC 244395	1.072±0.05	34.53±1.53	4.65±0.21	0.34±0.02	22.26±0.99	17.75±0.79	18.23±0.81
111	EC 244077	1.115±0.04	34.16±1.14	5.13±0.17	0.15±0.01	23.46±0.78	17.57±0.59	20.5±0.69
112	EC 723824	0.69±0.04	30.57±1.59	6.3±0.33	0.18±0.01	24.91±1.3	14.36±0.75	17.42±0.91
113	EC 108722	1.22±0.04	31.31±1.05	4.46±0.15	0.09±0	24.34±0.81	15.46±0.52	19.22±0.64
114	IC 259078	1.235±0.05	34.84±1.31	4.01±0.15	0.1±0	24.28±0.91	17.44±0.65	18.92±0.71
115	EC 724321	1.165±0.04	37.84±1.44	4.98±0.19	0.13±0	20.5±0.78	18.6±0.71	16.06±0.61
116	EC 240714	1.047±0.05	33.66±1.7	5.1±0.26	0.31±0.02	23.61±1.19	19.01±0.96	17.19±0.87
117	EC 724319	1.256±0.04	36.51±1.2	2.89±0.09	0.1±0	24.01±0.79	17.6±0.58	18.87±0.62
118	EC 240628	1.006±0.04	30.32±1.13	4.9±0.18	0.24±0.01	25.35±0.94	14.5±0.54	18.79±0.7
119	EC 240631	0.831±0.03	30.6±1.14	3.07±0.11	0.14±0.01	22.18±0.83	20.96±0.78	19.09±0.71
120	IC 202804	1.189±0.06	31.43±1.49	4.46±0.21	0.33±0.02	25.93±1.23	15.13±0.72	17.31±0.82