



Supplementary Materials

## Non-Destructive Classification of Diversely Stained *Capsicum annuum* Seed Specimens of Different Cultivars Using Near-Infrared Imaging Based Optical Intensity Detection

Jyothsna Konkada Manattayil <sup>1,+</sup>, Naresh Kumar Ravichandran <sup>2,+</sup>, Ruchire Eranga Wijesinghe <sup>3</sup>, Muhammad Faizan Shirazi <sup>4</sup>, Seung-Yeol Lee <sup>5</sup>, Pilun Kim <sup>6</sup>, Hee-Young Jung <sup>5,\*</sup>, Mansik Jeon <sup>2,\*</sup> and Jeehyun Kim <sup>2</sup>

- <sup>1</sup> Department of Electronics and Communication, Faculty of Engineering, Christ (Deemed to be University), Bangalore 560029, India; jyothsna.km@mtech.christuniversity.in
- <sup>2</sup> Kyungpook National University, College of IT Engineering, School of Electronics Engineering, 80, Daehakro, Buk-gu, Daegu 41566, Korea; nareshr.9169@gmail.com (N.K.R.); jeehk@knu.ac.kr (J.K.)
- <sup>3</sup> Department of Biomedical Engineering, College of Engineering, Kyungil University, 50, Gamasil-gil, Hayang-eup, Gyeongsan-si, Gyeongsangbuk-do 38428, Korea; eranga@kiu.kr
- <sup>4</sup> Center of Medical Physics and Biomedical Engineering, Medical University of Vienna, Waehringer Guertel 18-20, 1090 Vienna, Austria; muhammad.shirazi@meduniwien.ac.at (M.F.S.)
- <sup>5</sup> School of Applied Biosciences, Kyungpook National University, 80, Daehak-ro, Buk-gu, Daegu 41566, Korea; leesy1985@gmail.com
- <sup>6</sup> Institute of Biomedical Engineering, Kyungpook National University, 680, Gukchaebosang-ro, Jung-gu, Daegu 41944, Korea; pukim@knu.ac.kr
- \* Correspondence: heeyoung@knu.ac.kr (H.-Y.J.); msjeon@knu.ac.kr (M.J.); Tel.: +82-53-950-7846 (M.J.)
- + These authors contributed equally to this work.

Normalized Intensity Observed at different depths (a.u.)							
		Depth (μm)					
		100	200	300	400	500	
	seed1	0.5038	0.3344	0.238	0.1856	0.1439	
	seed2	0.4898	0.3251	0.2295	0.2013	0.1614	
C. annum (control)	seed3	0.4983	0.3127	0.2199	0.1731	0.1421	
	seed4	0.5258	0.3445	0.2477	0.1911	0.1791	
	seed5	0.4756	0.2972	0.2206	0.1741	0.1515	
	seed6	0.4744	0.3037	0.2207	0.1685	0.1513	
	seed7	0.4431	0.3588	0.3429	0.2242	0.1938	
	seed8	0.4393	0.3141	0.2259	0.1792	0.1526	
	seed9	0.4838	0.3098	0.2266	0.1768	0.1353	
	seed10	0.5215	0.3565	0.2607	0.1844	0.1617	
	Average	0.48554	0.32568	0.24325	0.18583	0.15727	
	Standard deviation	0.02755649	0.02079989	0.03551907	0.01570643	0.01682255	

Table S1. Normalized Intensity observed at different depths for all seeds in *C. annum* group (control).

Normalized Intensity Observed at different depths (a.u.)							
		Depth (µm)					
		100	200	300	400	500	
C. annuum cv. PR Ppareum	seed1	0.69	0.5267	0.4366	0.36	0.315	
	seed2	0.7321	0.5568	0.4484	0.3745	0.3314	
	seed3	0.6953	0.5404	0.4577	0.3763	0.324	
	seed4	0.7131	0.5501	0.4478	0.3798	0.3228	
	seed5	0.7088	0.5429	0.4394	0.3711	0.3377	
	seed6	0.6948	0.5309	0.4318	0.3554	0.3074	
	seed7	0.6707	0.5167	0.4281	0.3604	0.3386	
	seed8	0.6832	0.5325	0.4377	0.3696	0.3246	
	seed9	0.7051	0.5363	0.4376	0.3673	0.3124	
	seed10	0.6886	0.5255	0.4155	0.3566	0.3026	
	Average	0.69817	0.53588	0.43806	0.3671	0.32165	
	Standard deviation	0.01640671	0.01142741	0.01113159	0.00815733	0.01162439	

**Table S2.** Normalized Intensity observed at different depths for all seeds in *C. annuum* cv. PRPpareum group.

**Table S3.** Normalized Intensity observed at different depths for all seeds in *C. annuum* cv. PR Yeol group.

Normalized Intensity Observed at different depths (a.u.)								
		Depth (μm)						
		100	200	300	400	500		
	seed1	0.636	0.4894	0.4033	0.327	0.2876		
	seed2	0.6433	0.4809	0.4069	0.3356	0.2667		
	seed3	0.6817	0.472	0.3964	0.3288	0.2735		
eol	seed4	0.6527	0.5007	0.401	0.3362	0.2621		
PR Y	seed5	0.6448	0.4841	0.4004	0.3283	0.2697		
C. annuum cv. PR Yeol	seed6	0.6845	0.5034	0.3877	0.3195	0.2611		
m	seed7	0.6697	0.4797	0.3898	0.3334	0.2721		
nnu	seed8	0.6944	0.5467	0.4662	0.384	0.333		
C. a	seed9	0.6953	0.5544	0.4725	0.4006	0.363		
	seed10	0.7001	0.5412	0.4563	0.3784	0.3137		
	Average	0.67025	0.50525	0.41805	0.34718	0.29025		
	Standard deviation	0.02300279	0.02915508	0.03142977	0.02737944	0.03302436		

Normalized Intensity Observed at different depths (a.u.)								
		Depth (µm)						
		100	200	300	400	500		
	seed1	0.6113	0.4433	0.3664	0.2965	0.23		
	seed2	0.5979	0.454	0.341	0.2622	0.2153		
0	seed3	0.6898	0.5378	0.4733	0.3983	0.3394		
C. annuum cv. Asia Jeombo	seed4	0.615	0.469	0.3575	0.2924	0.2425		
	seed5	0.6329	0.4774	0.406	0.3325	0.2687		
	seed6	0.6457	0.466	0.373	0.2943	0.2366		
	seed7	0.631	0.4861	0.3873	0.3052	0.2647		
	seed8	0.6299	0.4467	0.3549	0.3036	0.2464		
ann	seed9	0.587	0.463	0.3975	0.3209	0.2646		
ن	seed10	0.6653	0.5034	0.3832	0.3074	0.2532		
	Average	0.63058	0.47467	0.38401	0.31133	0.25614		
	Standard deviation	0.02920407	0.02717731	0.03532858	0.03390923	0.03202718		

**Table S4.** Normalized Intensity observed at different depths for all seeds in *C. annuum* cv. Asia Jeombo group.