Genetic Diversity and Population Structure of Boro Rice Landraces of Bangladesh

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206

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C

A (© A) 4.15

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. 206

48 B

(A B). B

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A

D

- A C 4.0 . 3.25 35 , : , , , (C) . , A 6 36,37 . B - 38 . (A) A . C C , (2.3.4) 39, 40 . ( ) , , . 5,000 50,000 - . C 41 4 ( ) ' 42 . (CA) - .

D

A 48B 12 55 ( ) . A 55 .

A 228 55 48 B (2). 484 (296) 289 (88) . 472 (286-306), 484 (289-296) 591 (247-279), . 4.15, 2 (133, 145, 212, 316, 320, 338, 411, 452, 455 484) 10 (206). (C) 0.04 (455) 0.78 (206) 0.36. 206 C (0.78) (10). C . C , C , . 206 206 48 B . 0.04 0.81, 0.39. 29.17% (206) 97.92% (455). , 73.83% 48 . A 48 B 536 (1). , , B ( ) 1, 36, 34, 43 . , 29 , 4.18 C 0.488 21 (3). A , C 0.44 43 57 C . 45 . B , A . 1 350 45 3 14 7.8 . , 50 B - B 3.24 C 0.32, . 34 . A , 28 2.67 C 0.29 46 .

L : 1. - , 2. B , 3. B , 4. B 5. 6. , 7. B , 8. B , 9. B , 10. B 6/2, 11. B , 12. , 13. B , 14. A 2 ( ), 15. B B , 16. , 17. , 18. , 19. B , 20. , 21. , 22. B B , 23. B , 24. (B), 25. B , 26.B , 27. , 28. B , 29. B , 30.B ( ), 31. B , 32. B 2/2, 33. B 4/1, 34. B 26, 35. B 41/1, 36. B 48/1, 37. B 80/3, 38. B 80/5, 39. B 109/4, 40. B 138/2, 41. B 139/2, 42. B 200, 43. B 208, 44. B 259, 45. B 266, 46. B 576, 47. B 600, 48. B 704, = 1 .

A

A 39 25 . (19) . , (7) 144

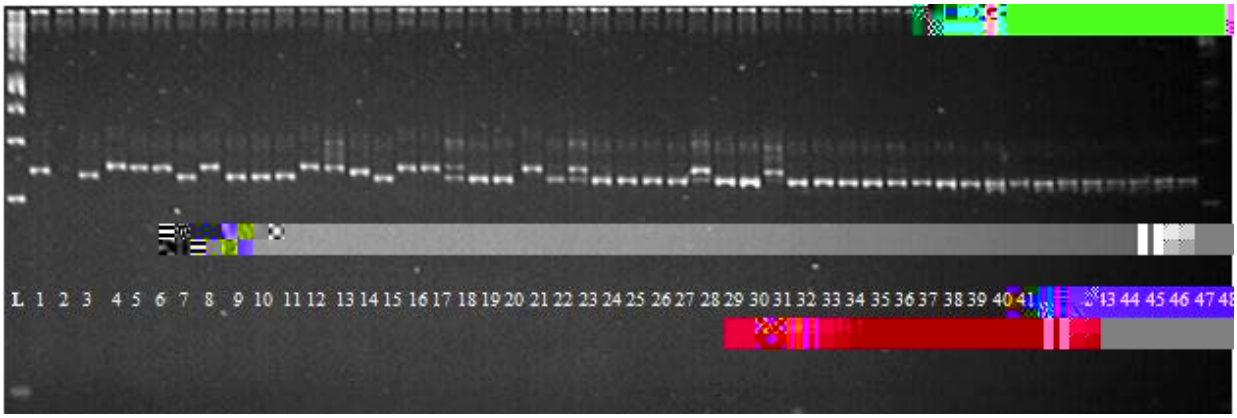

Figure 1: DNA profle of 48 Boro rice landraces with SSR marker RM536.

SL. No.	Marker	Chromosome No.	Position (cM)	Motif*	Allele No.	Unique allele	Size range (bp)		Size range		

(11, 220), 205 (9, 117), 206 (11, 152), 277 (12, 138), 342 (8, 152), 515 (8, 211) 307 (4, 125)

B (A . -1866). , (6) 19 (12, 239), 224 (11, 138), 262 (2, 167), 455 (7, 125), 125 (7, 152) 510 (6, 113) - (A . -149). A , (A . -931) 4 B (A . -261), (A . -937) B (A . -1051) 3 (4).

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. 47 , . 48 . 34 . . 47 (1, 21, 38, 170, 210, 226, 229)

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. A , . 49 58 B -B .

G

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( ) 48 B (2).

(37) (4), (4) (3).

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(37) . A , 2 (A B). -A, 30 -B 7 . C 4 (B , B 2/2, B 4/1 B 266) 4 (B 26, B 80/5,

Table 4: List of identifed unique alleles along with markers for 19 Boro rice landraces.

SL. No.	Marker	Chromosome No.	Unique Allele (bp)	Landraces
1	RM16	3	184	G 30 (Boro (sunga))
2	RM12	12	183	G 6(Pankaich)
3	RM12	12	208	G 15(Batti Boro)
4	RM19	12	204	G 9 (Borail)
5	RM19	12	216	G 4 (Bairagi Sail)
6	RM19	12	227	G 2 (Dholi Boro)
7	RM19	12	239	G 1 (Mi-Pajang)
8	RM144	11	220	G 31(Jala Boro)
9	RM201	9	188	G 40 (Kali Boro 138/2)
10	RM205	9	117	G 31 (Jala Boro)
11	RM206	11	152	G 31 (Jala Boro)
12	RM206	11	171	G 32 (Kali Boro 2/2)
13	RM206	11	192	G 28 (Deshi Boro)
14	RM206	11	198	G 7 (Boro Deshi)
15	RM207	2	148	G 5 (Tepi Khorch)
16	RM209	11	134	G 13 (Joya Boro)
17	RM209	11	176	G 4 (Bairagi Sail)
18	RM223	8	172	G 5 (Tepi Khorch)
19	RM224	11	138	G 1 (Mi-Pajang)
20	RM224	11	143	G 5 (Tepi Khorch)
21	RM252	4	230	G 16 (Madhabsail)
22	RM253	6	160	G 5 (Tepi Khorch)
23	RM262	2	161	G 13 (Joya Boro)
24	RM262	2	167	G 1 (Mi-Pajang)
25	RM277	12	138	G 31 (Jala Boro)
26	RM342	8	146	G 14 (Amboro 2 (golden))
27	RM342	8	152	G 31 (Jala Boro)
28	RM342	8	169	G 6 (Pankaich)
29	RM447	8	121	G 13 (Joya Boro)
30	RM447	8	145	G 18 (Jagli)
31	RM455	7	125	G 1 (Mi-Pajang)
32	RM515	8	211	G 31 (Jala Boro)
33	RM591	10	266	G 4 (Bairagi Sail)
34	RM303	4	107	G 21 (Dud Saita)
35	RM307	4	125	G 31 (Jala Boro)
36	RM307	4	147	G 6 (Pankaich)
37	RM334	5	172	G 12 (Sonar Geye)
38	RM125	7	152	G 1 (Mi-Pajang)
39	RM510	6	113	G 1 (Mi-Pajang)

B 259 B 576). (3)
(B 41/1, B 48/1
B 80/3). , . 34 . 10 5 48
43 (3) - - ( )
- ( ) 50 B = 2 (3),
113 , . -
, A B, .
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- C 2.3.4 . A (, 4) B
(, 4) 75% (36) 25% (12) B
, . , 11 (22.92%)
= 2.
A 36 B 28 08
B 12 09 03
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167 . . 43
B , . 34
50 B ,
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- ,
2 8 48, 51, 52 .

2 . B ,
. ,
. , , /
.

C A (C A)

(5 6). -
(1, A . 149), B (8, A . 939), B (9, A .
940), (16, A . 1651), B ( ) (30, A . 1861)
B (31, A . 1866)

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,
. C
4, 53, 54 .

A

Cluster-III Cluster-IV

Cluster-II

Cluster-I

Figure 2: An unrooted neighbor-joining tree showing the genetic relationships among 48 Boro rice landraces.

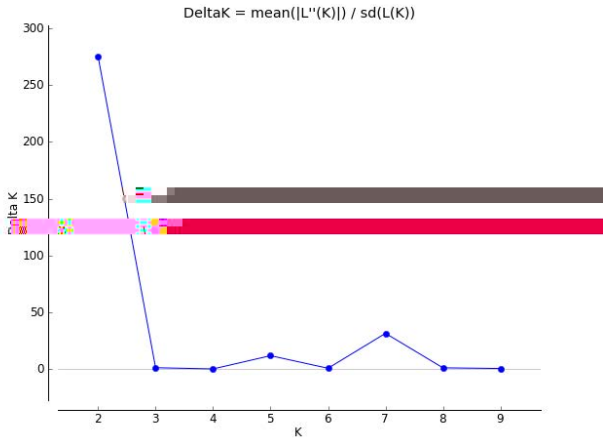

Figure 3: Estimation of population using LnP(D) derived ΔK for K from 1 to 10.

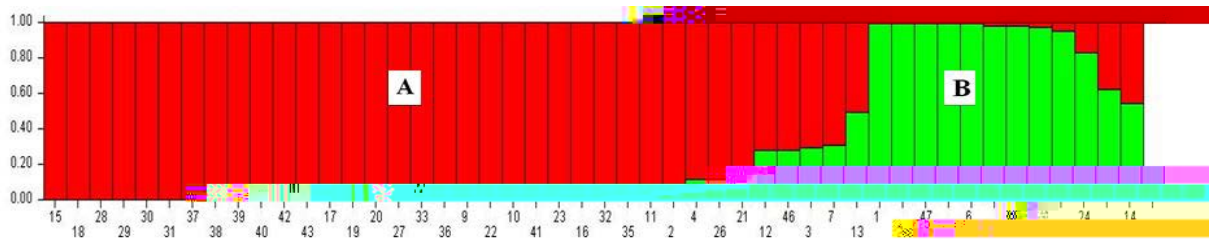

Figure 4: Assignment of 48 boro rice landraces into two populations (A and B) using STRUCTURE 2.3.4 software.

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