

, 24 9-kD

19-kD

16-kD 19-kD 24-kD

IgE

17,23

CAP system

19- 16-kD IgE

1.

1998 1 2007 12

2.

55

prick test)

mm

3. 16- 19- kD

100 mg

(skin

3

17,18

, RNeasy plant mini kit (Qiagen, Germantown, Md, USA)

RNA RNA

RACE-PCR (rapid amplification of cDNA ends polymerase chain reaction) cDNA cloning . pET-21a

(Novagen, Madison, Wisc., USA) NdeI HindIII

(TAKARA Korea Biomedical Inc., Seoul, Korea)

cDNA . pET construct BL21 (*Escherichia coli*)

1 mM -D-1-thiogalactopyranoside (sigma St. Louis, Mo., USA) . Ni-NTA affinity purification kit (Qiagen, Germantown, Md, USA)

SDS-PAGE IgE

immunoblotting IgE

4. IgE

Pharmacia CAP system (Pharmacia, Uppsala Sweden)

, 16-kD 19-kD

IgE UniCAP-100

3 biotinamido-hexanoyl-6-amino-hexanoic acid N-hydroxy-succinimide ester (NHS-Biotin, Sigma, St Louis Mo, USA)

. 100 g/mL

50 L CAP

30 IgE

. 0.35 kUL

5.

()

11 IgE 2 CAP

11 IgE Mann-Whitney gold standard

16 ROC

SPSS 12.0

1.

11

1

(Table 1).

No.	Age (yr)	Sex	Allergic symptom and/or disease	SPT (mm)	WBW (kU/L)	r16-kD (kU/L)	r19-kD (kU/L)
1	30	F	Urticaria	ND	1.23	<0.35	0.47
2	19	M	Urticaria	6.0	2.12	<0.35	0.98
3	24	F	Urticaria, angioedema, vomiting	8.0	67.80	<0.35	11.30
4	47	F	Urticaria, angioedema, vomiting, dyspnea	13.5	<0.35	<0.35	<0.35
5	22	F	Dyspnea, loss of consciousness	14.0	1.02	<0.35	<0.35
6	19	M	Urticaria, dyspnea	15.0	20.80	1.72	3.20
7	29	M	Urticaria, vomiting, oral allergy syndrome	16.0	39.60	0.75	7.27
8	28	M	Urticaria, dyspnea, abdominal pain	19.0	9.97	0.38	2.93
9	24	M	Urticaria, angioedema, dyspnea	22.0	10.70	<0.35	4.16
10	20	F	Urticaria, angioedema	24.0	50.10	1.42	5.32
11	25	M	Occupational asthma	26.0	43.50	0.50	10.10

Table 1. Clinical and laboratory data of the patients with buckwheat allergy

No.	Age (yr)	Sex	Allergic symptom and/or disease	SPT (mm)	Specific IgE (CAP, kU/L)		
					WBW	r16-kD	r19-kD
1	30	F	Urticaria	ND	1.23	<0.35	0.47
2	19	M	Urticaria	6.0	2.12	<0.35	0.98
3	24	F	Urticaria, angioedema, vomiting	8.0	67.80	<0.35	11.30
4	47	F	Urticaria, angioedema, vomiting, dyspnea	13.5	<0.35	<0.35	<0.35
5	22	F	Dyspnea, loss of consciousness	14.0	1.02	<0.35	<0.35
6	19	M	Urticaria, dyspnea	15.0	20.80	1.72	3.20
7	29	M	Urticaria, vomiting, oral allergy syndrome	16.0	39.60	0.75	7.27
8	28	M	Urticaria, dyspnea, abdominal pain	19.0	9.97	0.38	2.93
9	24	M	Urticaria, angioedema, dyspnea	22.0	10.70	<0.35	4.16
10	20	F	Urticaria, angioedema	24.0	50.10	1.42	5.32
11	25	M	Occupational asthma	26.0	43.50	0.50	10.10

SPT = skin prick test; ND = not done; WBW = whole buckwheat.

Table 2. Clinical and laboratory data of the asymptomatic buckwheat sensitizers

No.	Age (yr)	Sex	Known allergic disease	SPT (mm)	Specific IgE (CAP, kU/L)		
					WBW	r16-kD	r19-kD
1	44	F	Asthma	2.0	2.68	<0.35	<0.35
2	54	M	Allergic rhinitis	2.0	6.40	<0.35	0.36
3	20	M	Asthma, allergic rhinitis	3.0	2.26	<0.35	<0.35
4	45	F	Chronic urticaria	4.0	<0.35	<0.35	<0.35
5	36	F	Chronic urticaria	4.5	3.39	<0.35	<0.35
6	49	M	Asthma	4.5	17.40	<0.35	<0.35
7	19	M	Remitted from buckwheat allergy	5.0	12.10	<0.35	<0.35
8	39	M	Remitted from buckwheat allergy	6.0	<0.35	<0.35	<0.35
9	19	M	Asthma	6.0	1.09	<0.35	<0.35
10	15	F	Asthma, allergic rhinitis	11.5	3.90	0.62	4.60
11	24	M	Allergic rhinitis	18.0	7.12	<0.35	<0.35

SPT = skin prick test; WBW = whole buckwheat.

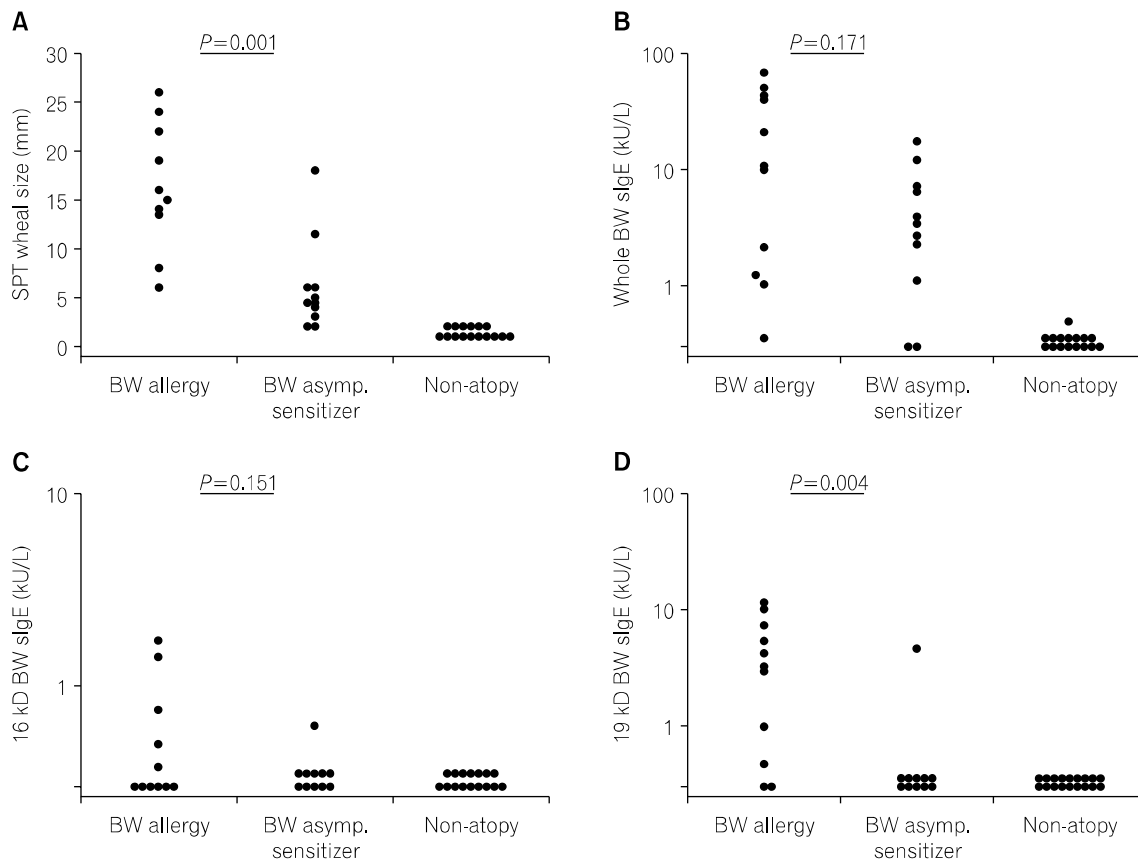


Fig. 1. Comparisons of laboratory findings among study groups. Skin prick test wheal size of BW allergic patients was significantly larger than that of asymptomatic sensitizers (A). Whole BW sIgE (B) and r16-kD sIgE (C) levels were higher in BW allergic patients without significance. r19-kD sIgE level was significantly higher in BW allergic patients (D).

Table 3. Cross table of buckwheat allergy and each specific IgE measurement method

	Buckwheat allergic patients	Asymptomatic sensitizers	<i>P</i> value	value
Skin prick test (n=10, BW allergy)	10	9	0.476	0.175
	0	2		
Whole BW sIgE	10	9	1.000	0.091
	1	2		
r16-kD BW sIgE	5	1	0.149	0.364
	6	10		
r19-kD BW sIgE	9	2	0.009	0.636
	2	9		

BW = buckwheat.

Table 4. ROC analysis of each specific IgE measurement method for differentiation of buckwheat allergic patients from asymptomatic sensitizers

	Area under the curve	95% confidential interval	<i>P</i> value	Coordinate point
Skin prick test (wheal size, mm)	0.918	0.797 1.040	0.001	7.0
Whole BW sIgE (kU/L)	0.718	0.476 0.960	0.091	8.55
r16-kD BW sIgE (kU/L)	0.709	0.478 0.940	0.105	0.44
r19-kD BW sIgE (kU/L)	0.845	0.664 1.027	0.007	0.67

BW = buckwheat.

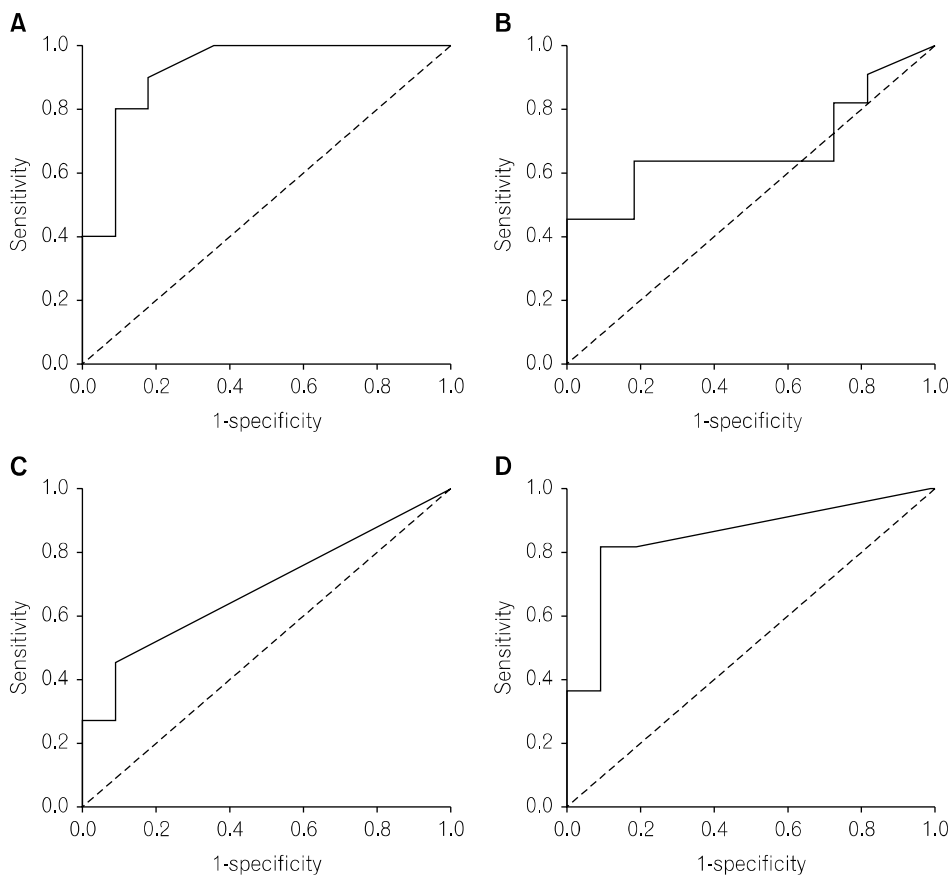


Fig. 2. ROC curves for each laboratory methods to discriminate buckwheat allergic patients from asymptomatic sensitizers. Area under the curve (AUC) of skin prick test was the largest with 0.918 ($P=0.001$) (A). Whole buckwheat (BW) sIgE and r16-kD sIgE showed AUC values over 0.7 but they were insignificant ($P > 0.05$). r19-kD sIgE showed AUC 0.845 with statistical significance ($P=0.007$) and its coordinate point was 0.67 kU/L.

IgE 0.845 ($P=0.007$)
 19-kD ROC 80%, 91% (Fig 2).

(Table 4).
 0.67 kU/L (

584
 IgE

28

CAP system

IgE

27,28

24

IgE

29 Morita 22

46,8

omega-5-gliadin

IgE

30 Holzhauser

CAP system

Rebel 25

IgE

Gly m 5

Gly m 6

IgE

. Bubin ³¹⁾
 30
 IgE
 IgE
 Act d 1
 CAP IgE
 16- 19-kD
 CAP IgE
 CAP IgE 11
 10 , 11 9
 19-kD CAP
 IgE 0.35 kU/L cut-off 11 2
 9 11 5 16-kD 11 2
 1
 ROC
 0.918
 0.845
 19-kD 16-kD
 0.709 (*P* > 0.05) 19-kD
 19-kD 16-kD IgE
 IgE
 IgE immunoblotting
 19-kD, 16-kD
 16) 19-kD

16-kD 24-kD 11 S globulin, 9-kD vicilin
 IgE
 pepsin
 (conforma-
 tional)
 pepsin 19-kD 16-kD
 19-kD 16-kD
 CAP system
 IgE
 19-kD IgE

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