

1 **SUPPLEMENTARY INFORMATION**

2 **Table S1(A).** Effect of ajoene on the growth and survival of *C. sakazakii* in phosphate buffer saline and
 3 tryptic soy broth at different temperatures and time intervals.

Medium	Temp (°C)	Concn. of ajoene (mM)	No. of viable cells (log CFU/ml) at:					
			0 h	1 h	2 h	4 h	8 h	12 h
PBS	37	0	4.11±0.12	4.09±0.15	4.03±0.10	4.10±0.10	4.16±0.06	4.10±0.07
		DMSO	4.10±0.06	4.07±0.18	4.07±0.10	4.05±0.17	4.11±0.12	4.13±0.11
		0.0777	4.01±0.07	4.03±0.22	3.95±0.19	3.89±0.19	3.67±0.12	3.41±0.20
		0.777	3.99±0.18	3.91±0.22	3.70±0.34	3.15±0.40	ND	ND
		3.88	3.92±0.12	3.33±0.31	ND	ND	ND	ND
		7.77	3.91±0.10	ND ^a	ND	ND	ND	ND
	22	0	4.00±0.14	4.01±0.09	4.04±0.09	4.01±0.05	4.16±0.10	4.16±0.11
		DMSO	3.95±0.11	4.04±0.09	4.09±0.09	4.04±0.10	4.15±0.04	4.04±0.08
		0.0777	3.97±0.09	4.02±0.10	4.01±0.06	4.03±0.10	4.05±0.08	3.90±0.09
		0.777	3.96±0.11	3.97±0.13	3.95±0.12	3.97±0.12	3.84±0.09	3.38±0.06
		3.88	3.92±0.10	3.86±0.10	3.81±0.12	3.14±0.12	ND	ND
		7.77	3.81±0.05	3.56±0.12	2.64±0.18	ND	ND	ND
	4	0	4.03±0.10	4.03±0.10	3.93±0.07	4.03±0.13	4.03±0.10	4.09±0.05
		DMSO	3.97±0.13	3.91±0.09	3.98±0.09	4.04±0.07	3.95±0.09	3.93±0.07
		0.0777	3.88±0.08	3.92±0.20	3.78±0.16	3.89±0.03	3.77±0.17	3.78±0.09
		0.777	3.88±0.12	3.93±0.04	3.85±0.13	3.90±0.09	3.75±0.11	3.78±0.10
		3.88	3.85±0.09	3.93±0.09	3.86±0.16	3.39±0.23	ND	ND
		7.77	3.93±0.05	3.21±0.32	ND	ND	ND	ND
TSB	37	0	3.90±0.10	3.85±0.11	3.91±0.07	4.63±0.13	8.07±0.07	8.75±0.16
		DMSO	3.80±0.12	3.87±0.09	3.89±0.08	4.59±0.14	7.84±0.05	8.57±0.14
		0.0777	3.86±0.11	3.86±0.05	3.85±0.13	4.21±0.07	7.67±0.09	8.55±0.14
		0.777	3.85±0.11	3.83±0.08	3.81±0.09	3.46±0.14	3.26±0.12	5.30±0.10
		3.88	3.86±0.08	3.73±0.14	3.76±0.11	3.16±0.21	ND	ND
		7.77	3.91±0.06	3.82±0.10	3.47±0.19	3.06±0.16	ND	ND
	22	0	3.91±0.05	3.97±0.05	3.95±0.05	4.02±0.08	4.87±0.06	5.96±0.10
		DMSO	3.99±0.09	4.00±0.06	4.00±0.09	4.01±0.11	4.92±0.11	5.89±0.08
		0.0777	3.94±0.12	3.94±0.05	3.93±0.07	3.91±0.08	4.83±0.09	5.90±0.13
		0.777	3.96±0.14	3.97±0.09	3.96±0.07	3.96±0.11	4.21±0.07	5.32±0.07
		3.88	3.94±0.14	3.95±0.10	3.97±0.15	3.97±0.10	3.90±0.05	3.86±0.04
		7.77	3.93±0.09	4.04±0.07	3.96±0.14	3.91±0.09	3.91±0.07	3.90±0.08

	0	3.95±0.06	3.99±0.07	3.96±0.05	3.94±0.03	3.98±0.07	3.92±0.05
	DMSO	3.95±0.06	3.95±0.10	3.97±0.05	3.96±0.08	3.98±0.04	3.99±0.08
4	0.0777	3.98±0.05	3.99±0.09	3.98±0.06	3.97±0.10	3.89±0.06	3.88±0.13
	0.777	4.03±0.07	3.92±0.07	3.92±0.09	3.88±0.06	3.92±0.12	3.79±0.18
	3.88	3.93±0.06	3.95±0.08	3.90±0.10	3.89±0.14	3.81±0.15	3.78±0.06
	7.77	3.95±0.10	3.98±0.12	3.90±0.04	3.93±0.10	3.72±0.15	3.77±0.11

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5 **Table S1(B).** Effect of diallyl sulfide on the growth and survival of *C. sakazakii* in phosphate buffer
6 saline and tryptic soy broth at different temperatures and time intervals.

Medium	Temp (°C)	Concn. of diallyl sulfide (mM)	No. of viable cells (log CFU/ml) at:					
			0 h	1 h	2 h	4 h	8 h	12 h
PBS	37	0	4.43±0.22	4.48±0.25	4.42±0.18	4.45±0.21	4.43±0.13	4.47±0.09
		0.777	4.40±0.20	4.46±0.16	4.29±0.15	4.27±0.31	4.20±0.25	3.93±0.32
		3.88	4.46±0.17	4.08±0.30	3.92±0.36	3.85±0.32	3.72±0.34	3.56±0.42
		7.77	4.33±0.18	ND	ND	ND	ND	ND
		77.7	4.08±0.16	ND	ND	ND	ND	ND
	22	0	4.38±0.08	4.35±0.07	4.37±0.09	4.43±0.06	4.39±0.08	4.38±0.09
		0.777	4.36±0.06	4.34±0.05	4.41±0.06	4.35±0.07	4.34±0.07	4.27±0.10
		3.88	4.28±0.11	4.19±0.13	4.19±0.11	4.21±0.10	4.16±0.11	4.09±0.16
		7.77	4.20±0.10	ND	ND	ND	ND	ND
		77.7	2.89±0.12	ND	ND	ND	ND	ND
	4	0	4.32±0.11	4.39±0.29	4.44±0.08	4.42±0.14	4.39±0.15	4.41±0.19
		0.777	4.40±0.18	4.38±0.16	4.32±0.19	4.31±0.22	4.27±0.17	4.44±0.16
		3.88	4.38±0.17	4.11±0.23	4.18±0.27	4.14±0.22	4.22±0.16	4.23±0.21
		7.77	3.97±0.28	ND	ND	ND	ND	ND
		77.7	ND	ND	ND	ND	ND	ND
TSB	37	0	4.33±0.11	4.30±0.14	4.56±0.09	6.16±0.18	8.31±0.12	8.91±0.15
		0.777	4.17±0.09	4.26±0.13	4.49±0.11	5.94±0.11	8.35±0.13	8.76±0.17
		3.88	4.16±0.07	4.27±0.05	4.46±0.12	5.87±0.27	8.22±0.08	8.61±0.13
		7.77	3.28±0.22	ND	ND	ND	5.56±0.16	8.09±0.06
		77.7	ND	ND	ND	ND	ND	ND
	22	0	3.97±0.05	3.93±0.05	3.95±0.07	4.10±0.13	4.99±0.07	6.00±0.07
		0.777	3.96±0.04	3.91±0.04	3.98±0.07	4.10±0.10	4.94±0.09	5.89±0.06
		3.88	3.89±0.05	3.91±0.05	3.92±0.09	3.94±0.09	5.02±0.09	5.57±0.12
		7.77	3.94±0.03	2.57±0.12	2.65±0.12	2.81±0.20	3.02±0.19	3.93±0.10
		77.7	3.42±0.20	ND	ND	ND	ND	ND
4	0	4.37±0.05	4.32±0.10	4.31±0.12	4.39±0.04	4.42±0.08	4.28±0.12	
	0.777	4.37±0.07	4.38±0.07	4.42±0.04	4.35±0.05	4.46±0.05	4.32±0.15	
	3.88	4.31±0.06	4.29±0.17	4.32±0.12	4.31±0.08	4.29±0.07	4.23±0.05	
	7.77	4.28±0.05	2.48±0.43	ND	ND	ND	ND	
	77.7	3.57±0.15	ND	ND	ND	ND	ND	

^a ND: Non-detectable.

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9 **Table S2.** Effect of 3.88 mM ajoene and diallyl sulfide supplemented with L-cysteine on the growth and
 10 survival of *C. sakazakii* in phosphate buffer saline at 37°C.

Method	No. of viable cells (log CFU/ml) at:					
	0 h	1 h	2 h	4 h	8 h	12 h
0	3.95±0.08	3.84±0.09	3.93±0.10	4.00±0.08	4.02±0.05	4.07±0.03
DMSO	3.90±0.12	3.80±0.10	3.88±0.09	3.97±0.07	4.01±0.06	4.07±0.05
ajoene + L-cysteine	3.87±0.10	3.81±0.09	3.83±0.09	3.86±0.10	3.46±0.12	3.29±0.19
ajoene	3.88±0.10	ND ^a	ND	ND	ND	ND
diallyl sulfide + L-cysteine	2.95±0.25	ND	ND	ND	ND	ND
diallyl sulfide	2.76±0.37	ND	ND	ND	ND	ND

11 ^a ND: Non-detectable.

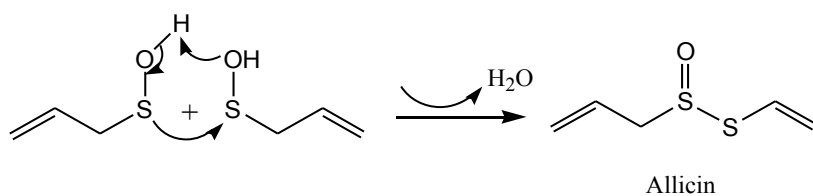
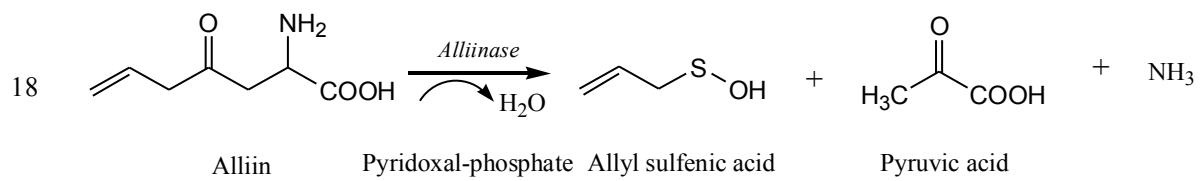
12

13 **Table S3.** List of differentially regulated *C. sakazakii* genes following treatment with garlic derived
 14 organosulfur compounds.

15

16 Please see individual file (Supplemental Table S3.xlsx).

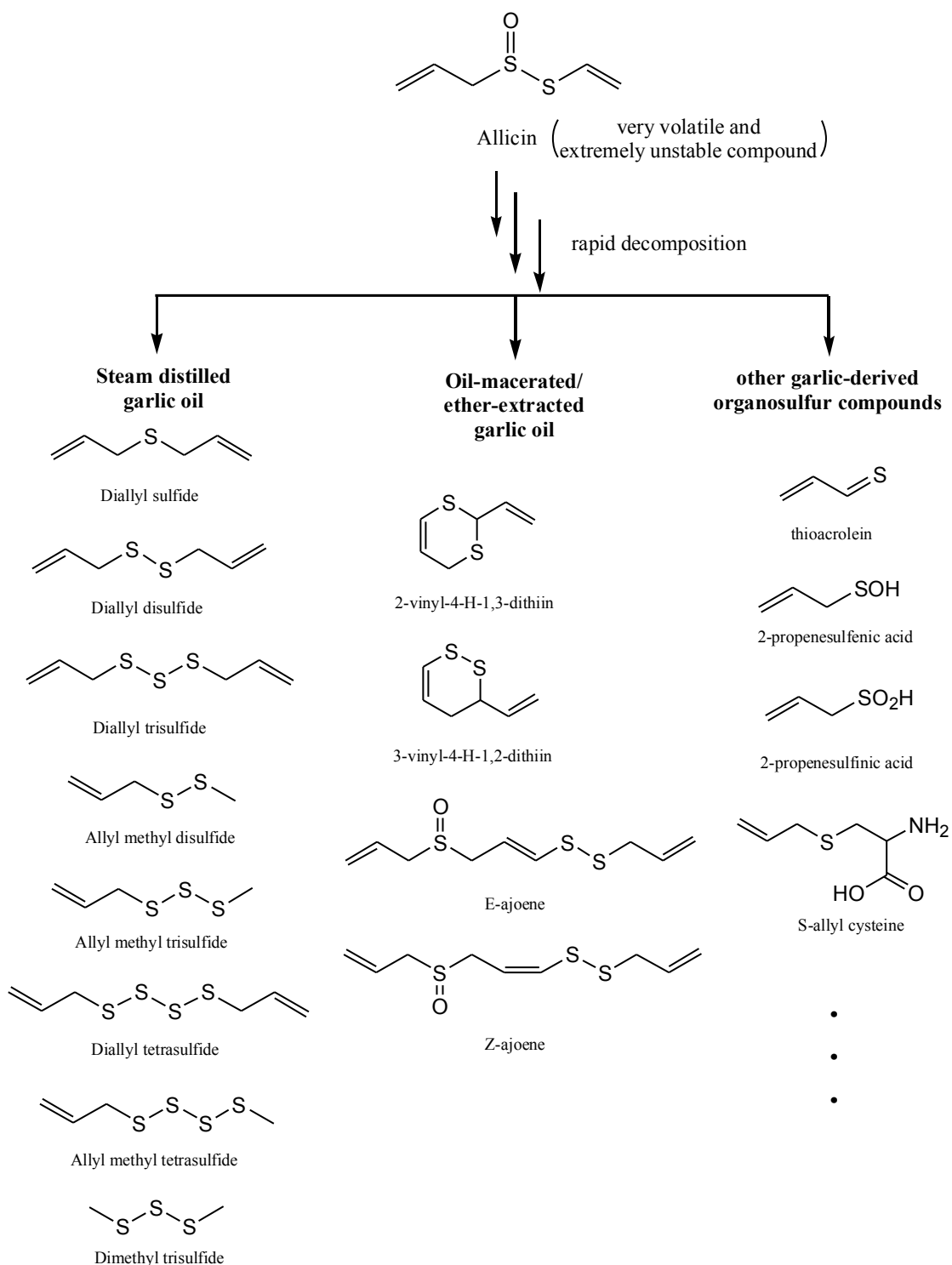
17



19

20 **Figure S1(A).** The formation of allicin in garlic.

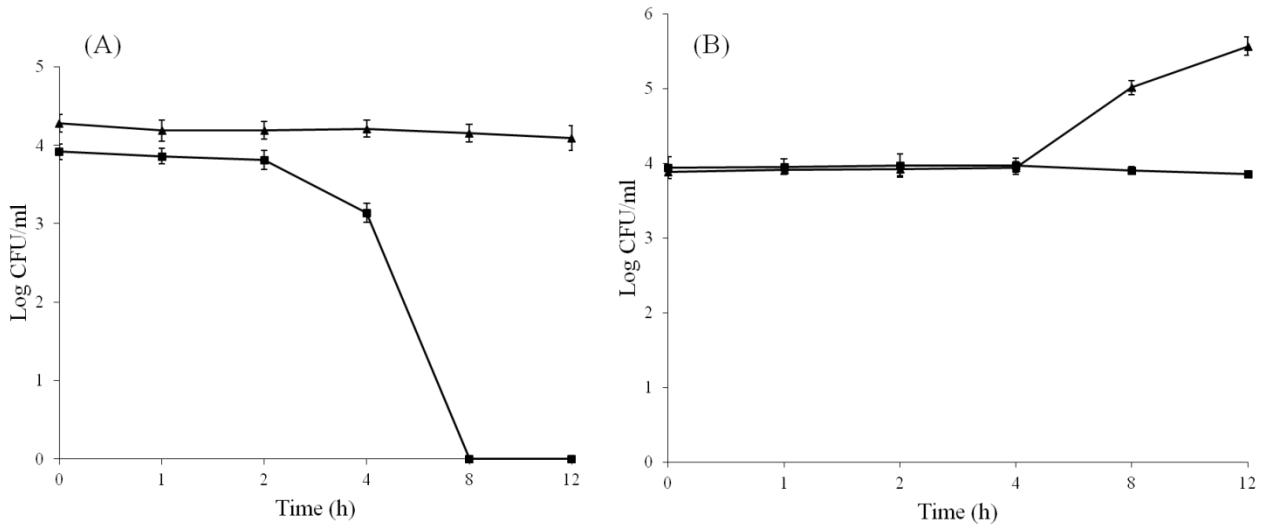
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24 **Figure S1(B).** The formation of stable organosulfur compounds derived from degradation of allicin in
 25 garlic.

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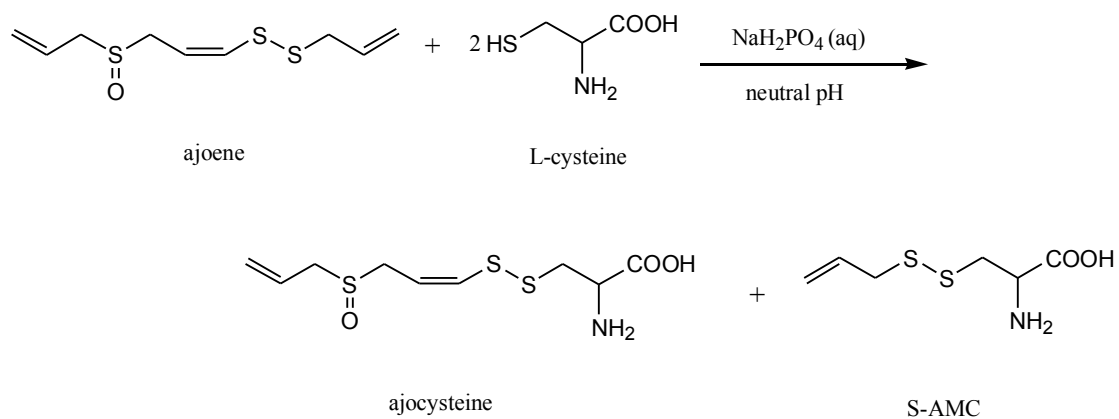


28

29 **Figure S2.** Antibacterial effect of ajoene (squares) and diallyl sulfide (triangles) on *C. sakazakii* in
30 phosphate-buffered saline (panel A) and tryptic soy broth (panel B) at 22°C.

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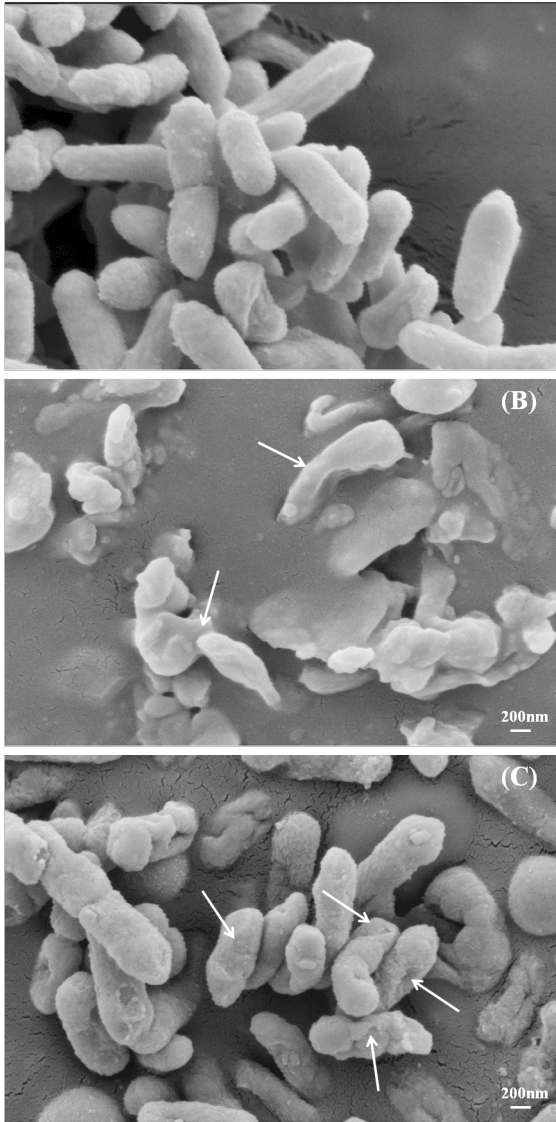


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35 **Figure S3.** Ajoene can rapidly react with L-cysteine.

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38 **Figure S4.** Scanning electron microscopic images of *C. sakazakii* without (A) and with the treatment of
39 diallyl sulfide (B) and ajoene (C). Arrows refer to the morphological variations of bacterial cells.

40 SUPPLEMENTARY INFORMATION OF CODES FOR CHEMOMETRIC MODELS

41 1. Matlab code for spectroscopic-based principal component analysis:

```
42 function pca_total(x,k,z)
43 [coeff, score, latent, tsquare] = princomp(x);
44 loading=coeff(:,1:k);
45 rep_x=score(:,1:k);
46 xlabel('PC 1');
47 ylabel('PC 2');
48 zlabel('PC 3');
49 figure
50 a=score(:,1:2);
51 size(a)
52 s_dist=pdist(a);
53 ss=pdist(a,'mahalanobis');
54 size(ss)
55 squareform(s_dist);
56 s_tree=linkage(s_dist);
57 size(s_tree)
58 dendrogram(s_tree,150,'orientation','top');
59 figure
60 plot(z,coeff(:,1),'r');
61 hold on
62 plot(z,coeff(:,2)+0.25,'g');
63 plot(z,coeff(:,3)+0.50,'b');
64 latent = diag(latent);
65 totalvar = sum(latent);
66 explained = 100*latent/totalvar;
```

67 2. Matlab code for spectroscopic-based Bayesian probability:

```
68 function y = bayesleastererror(sample)
69 clc;
70 load templet pattern;
71 [pcapat, pcasamp] = pcapro(sample);
72 temp = 0;
73 for i = 1:10
74     pattern(i).feature = pcapat(:, temp+1:temp + pattern(i).num);
75     temp = temp + pattern(i).num;
76 end
77 s_cov = [];
78 s_inv = [];
79 s_det = [];
80 for i = 1:10
81     s_cov(i).dat = cov(pattern(i).feature');
82     s_inv(i).dat = inv(s_cov(i).dat);
```

```

84     s_det(i) = det(s_cov(i).dat);
85 end
86 sum1 = 0;
87 p = [];
88 for i = 1:10
89     sum1 = sum1 + pattern(i).num;
90 end
91 for i = 1:10
92     p(i) = pattern(i).num/sum1;
93 end
94 h = [];
95 mean_sap = [];
96 for i = 1:10
97     mean_sap(i).dat = mean (pattern(i).feature')';
98 end
99 for i = 1:10
100     h(i) = (pcasamp-mean_sap(i).dat)'*s_inv(i).dat*(pcasamp-mean_sap(i).dat)...*(-
101 0.5)+log(p(i))+log(abs(s_det(i)))*(-0.5);
102 end
103 [maxval maxpos] = max(h);
104 y = maxpos - 1;
105

```