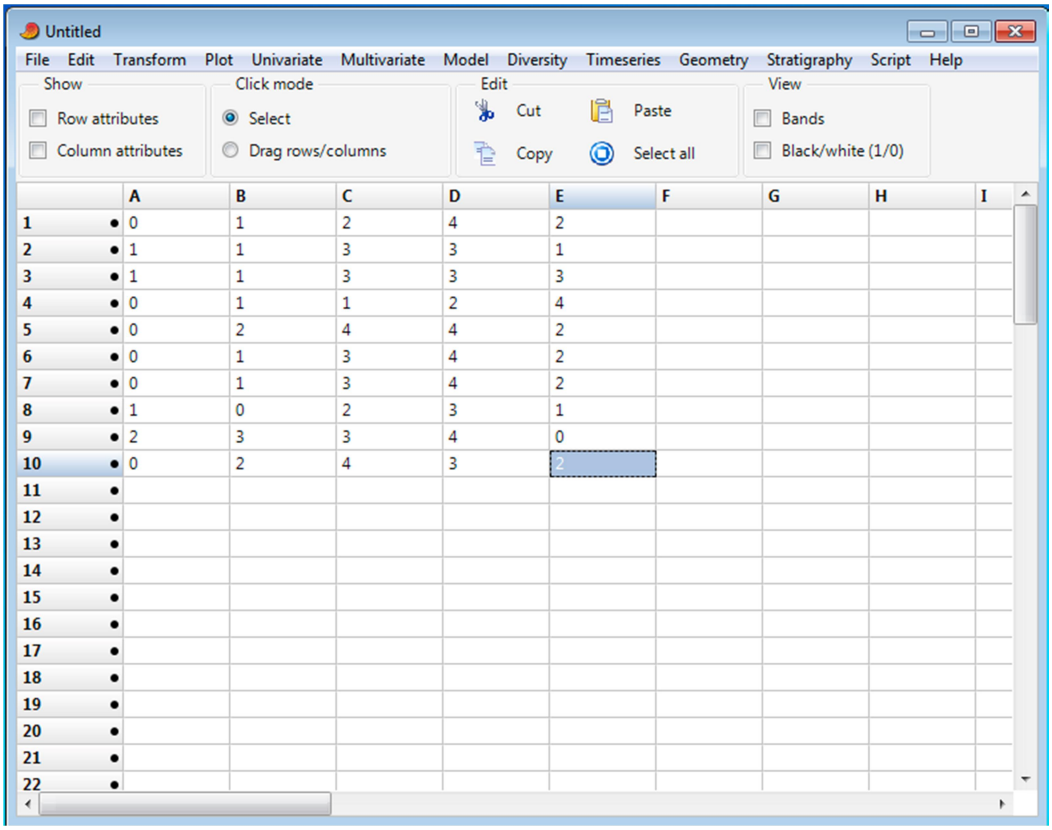
Appendix S1. Detailed instructions for analyzing the plant pathology example data in PAST version 3. The screenshots are for the Windows version (differences from the Macintosh version are indicated).

Data entry

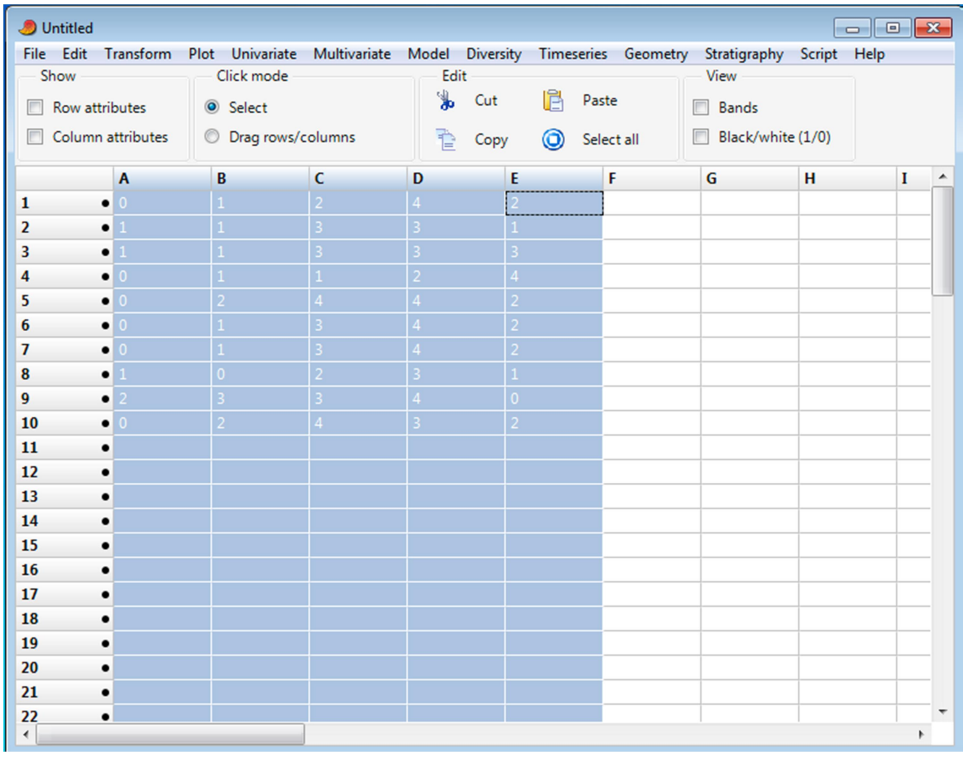
Data entry in PAST 3 is via a spreadsheet format. Each group is entered in a separate column.



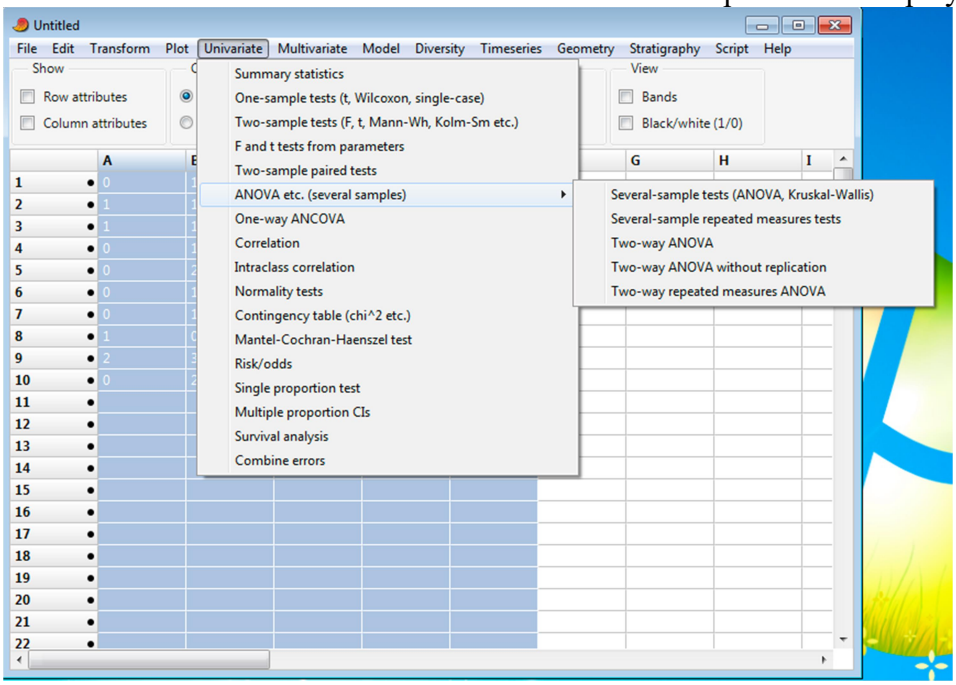
	A	B	C	D	E	F	G	H	I
1	0	1	2	4	2				
2	1	1	3	3	1				
3	1	1	3	3	3				
4	0	1	1	2	4				
5	0	2	4	4	2				
6	0	1	3	4	2				
7	0	1	3	4	2				
8	1	0	2	3	1				
9	2	3	3	4	0				
10	0	2	4	3					
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									

Specifying the analysis

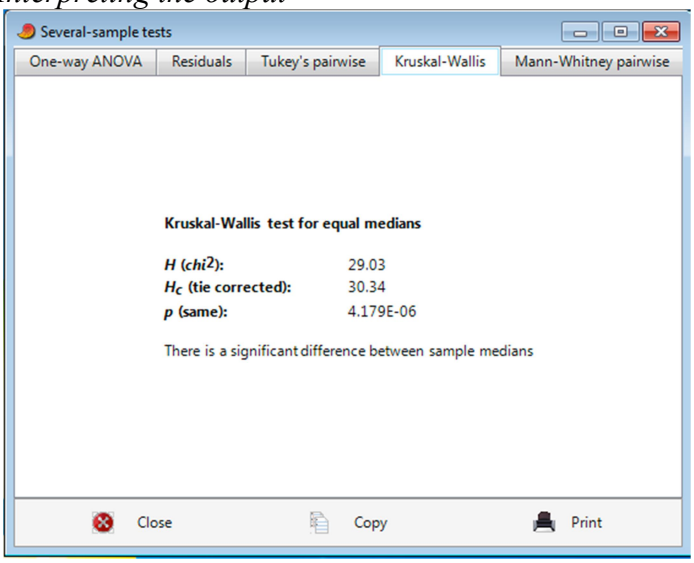
Each column with data should be selected by holding down the shift key and clicking the letter at the head of each column.



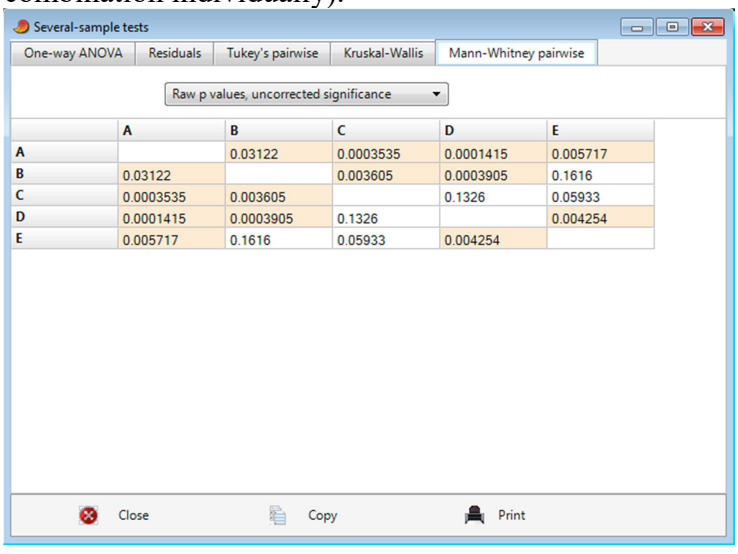
Next, open the univariate menu (fifth from left) and select “Several sample tests (ANOVA, Kruskal-Wallis).” By default, PAST displays the one-way ANOVA results. Click the Kruskal-Wallis tab and the Kruskal-Wallis output will be displayed.



Interpreting the output



The test is significant ($P < 0.05$), so the groups do not all come from the same population. To determine which groups are dissimilar, click the "Mann-Whitney pairwise" button (top right). The default screen (below) shows pairwise tests between groups with no correction for multiple tests. Significant values are highlighted. (Note: the "Mann-Whitney pairwise" button is unavailable in the Macintosh version, although Macintosh users could select the option for Mann-Whitney tests and analyze each paired combination individually).



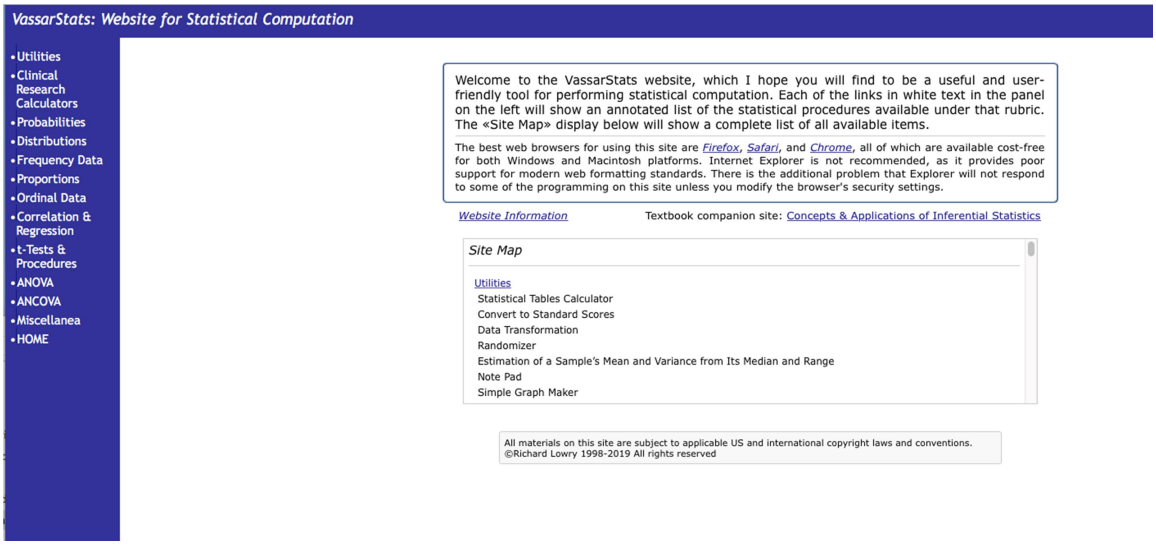
	A	B	C	D	E
A		0.03122	0.0003535	0.0001415	0.005717
B	0.03122		0.003605	0.0003905	0.1616
C	0.0003535	0.003605		0.1326	0.05933
D	0.0001415	0.0003905	0.1326		0.004254
E	0.005717	0.1616	0.05933	0.004254	

To correct for multiple tests, click the drop-down arrow at the left of the button "Raw p values, uncorrected significance" and choose either a Bonferroni correction or a sequential Bonferroni correction. In each case, significant values are highlighted. (These features are unavailable in the Macintosh version. If Mann-Whitney tests are selected individually for each pair of groups, Bonferroni or sequential Bonferroni corrections will need to be applied manually).

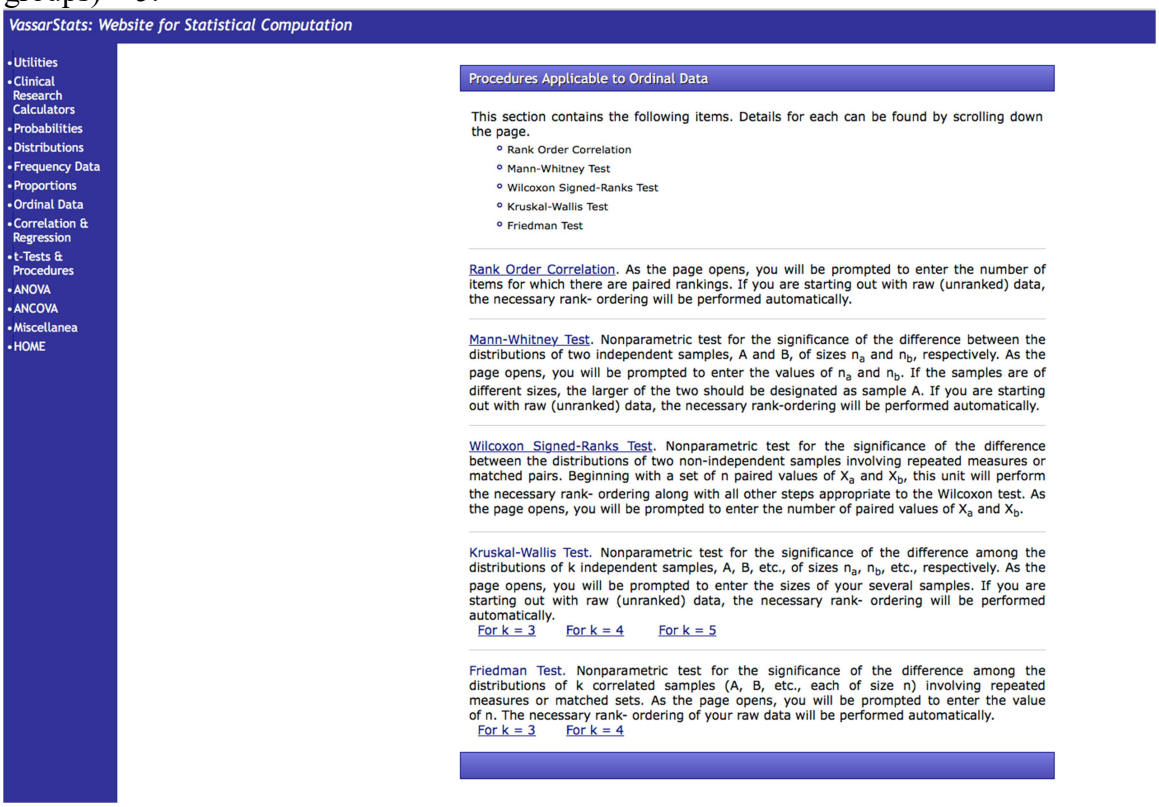
Appendix S2. Detailed instructions for analyzing the plant pathology example data in VassarStats (http://vassarstats.net). The screenshots were taken on a Macintosh using the Safari browser.

Data entry

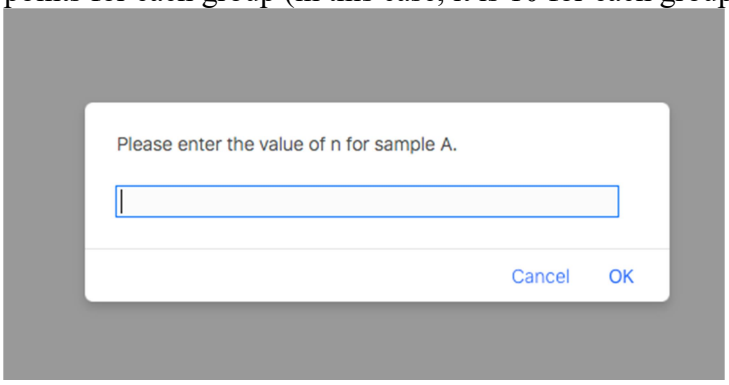
On the home page for VassarStats, click the "Ordinal data" tab in the list on the left. (As an aside, also note that this page links to an online free statistics textbook where detailed explanations of the analyses are provided).



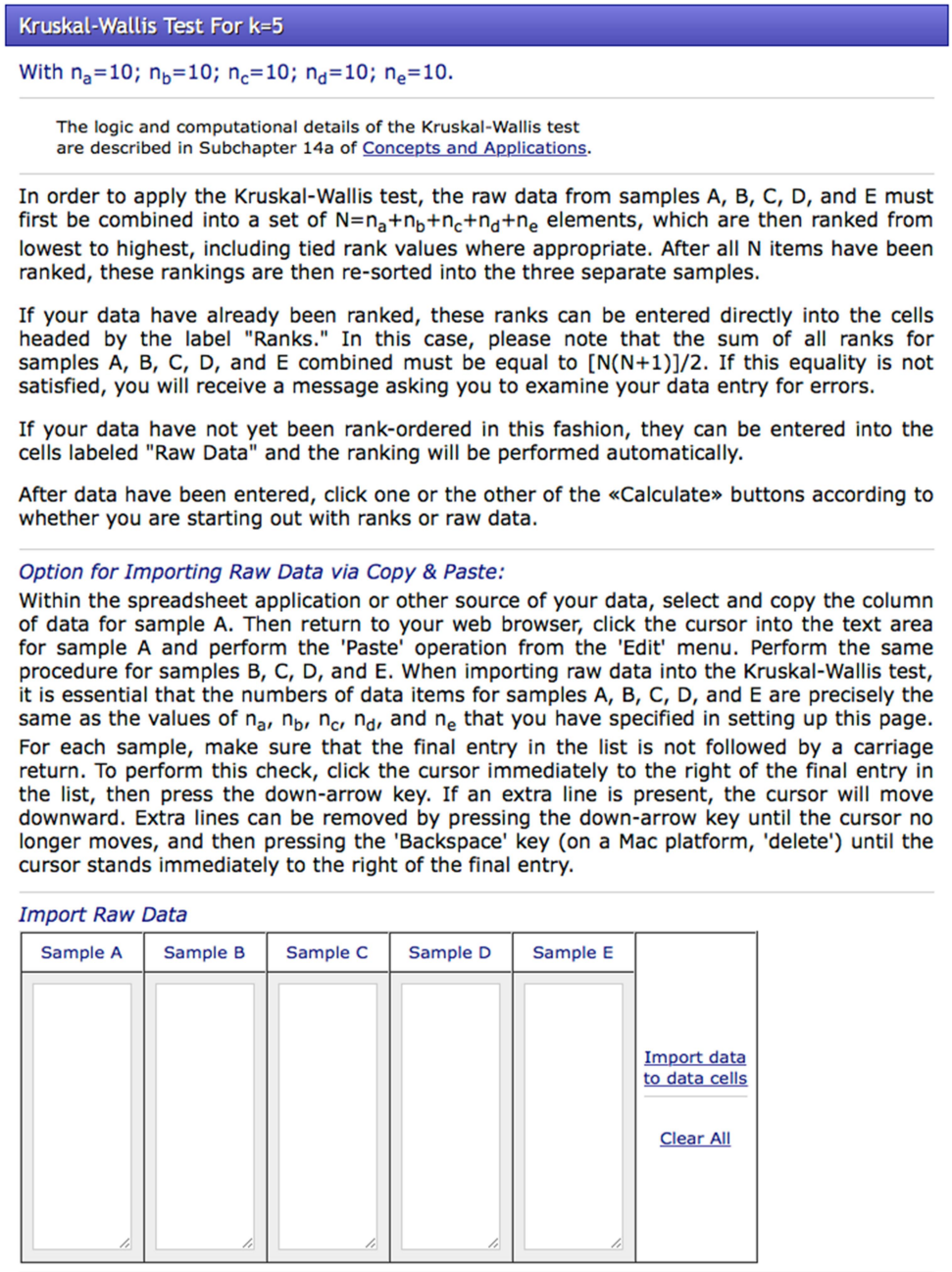
On the ordinal data page, click the link for the Kruskal-Wallis test with *k* (number of groups) = 5.



In the data-entry window that opens, you will be prompted to enter the number of data points for each group (in this case, it is 10 for each group).



Once you have specified the size of each group, a data-entry window opens. Follow the directions to enter the data.



Interpreting the output

The output includes a display of the ranks calculated from the raw data and the *H* statistic with degrees of freedom, but not *H* corrected for ties. There is no provision for post hoc pairwise testing, although this could be done by selecting the option for Mann-Whitney tests and analyzing each paired combination individually. Bonferroni or sequential Bonferroni corrections would need to be applied manually. VassarStats does, though,

offer a handy “Mean Ranks for Sample” table in the output that is useful for a quick visual inspection of trends in the data, albeit without pairwise significance testing.

Data Entry

	Ranks for Sample					Raw Data for Sample				
count	A	B	C	D	E	A	B	C	D	E
1	4.5	14.5	26	46.5	26	0	1	2	4	2
2	14.5	14.5	37	37	14.5	1	1	3	3	1
3	14.5	14.5	37	37	37	1	1	3	3	3
4	4.5	14.5	14.5	26	46.5	0	1	1	2	4
5	4.5	26	46.5	46.5	26	0	2	4	4	2
6	4.5	14.5	37	46.5	26	0	1	3	4	2
7	4.5	14.5	37	46.5	26	0	1	3	4	2
8	14.5	4.5	26	37	14.5	1	0	2	3	1
9	26	37	37	46.5	4.5	2	3	3	4	0
10	4.5	26	46.5	37	26	0	2	4	3	2
Reset	Calculate from Ranks					Calculate from Raw Data				

Mean Ranks for Sample						
A	B	C	D	E		
9.7	18.1	34.5	40.7	24.7	H =	29.03
					df =	4
					P =	<0.0001 *

*If the size of each of your samples is at least 5, the sampling distribution of H can be taken as a reasonably close approximation of the sampling distribution of chi-square with df = k—1. If any of your samples are of a size smaller than 5, you should regard the calculated P-value as an imperfect approximation.