TABLE 5. Summary of the canonical analysis on the twelve measurements made on males and females of the three species. The weighting values given in part 1 can be used to calculate canonical vector values for new individuals and the weightings in part 2 can be compared directly to show the relative importance of each variable in the interpretation of the canonical vector.

Original variable	Part 1: Canonical vector normalized to give unit within-group SD (weighting values)				Part 2: Canonical vector standardized to have unit total variance and scaled to have maximum weighting of unity			
	Weighting values, first vector		Weighting values, second vector		Weighting values, first vector		Weighting values, second vector	
	♀	♂	♀	♂	♀	♂	♀	♂
Headwidth	0.039	−0.033	−0.214	−0.117	0.196	−0.035	−1.000*	−0.188
Head length	0.189	−0.094	−0.058	−0.043	1.000*	−0.104	−0.287	−0.072
Frons width	−0.269	0.120	0.366	0.099	−0.353‡	0.100	0.451‡	0.125
Eye length	0.256	−0.223	−0.180	−0.229	0.394‡	−0.197‡	−0.261	−0.306
Scape length		0.324		0.005		1.000*		0.022
Thorax width	0.085	−0.173	0.091	−0.151	0.364‡	−0.225†	0.367	−0.296
Spine length	0.095		0.205		0.342‡		0.694†	
Petiole width	0.018	−0.030	−0.240	−0.025	0.033	−0.044	−0.424‡	−0.055
Post-petiole width	−0.237	0.095	−0.109	0.375	−0.681†	0.167	−0.294	1.000*
Post-petiole height	0.071	0.074	−0.020	−0.177	0.194	0.119	−0.052	−0.433‡
Bristle number	−0.127	−0.095	−0.139	0.302	−0.194	−0.143	−0.200	0.687†
Bristle length	−0.062	−0.082	−0.086	0.242	−0.153	−0.098	−0.200	−0.438‡

* First most important variable contributing to canonical vector.
† Second most important variable contributing to canonical vector.
‡ Third most important variable contributing to canonical vector.

within the groups to give a set of canonical vectors (cv). There will at most be one less vector than the number of groups, thus, in this case, three species will produce two cv's. If each cv is normalized to give unit within-group SD, then for any set of measurements the cv can be thought of the sum of those measurements each adjusted by a weighting value: or cv = $\Sigma_1^N (a_i X_i)$ where X_i is the ith measurement of N measurements and a_i is the weighting value applied to that measurement. Table 5 (part 1) gives the weighting values (a) which can be used to work out cv values for individuals or group means from the individual measurements or group mean measurements. Note that in this paper the morphometrics (X), with the exception of the count of hair number, have been multiplied by 100 (= mm × 100) before being used to calculate the cv value: this simply makes the cv values larger and more manageable. In order to interpret the canonical variates in terms of these original measurements the vectors have to be standardized so that each variable has a unit total variance and then scaled to give a maximum weighting of unity. These weightings can then be compared directly to see which contributes the most to the canonical variant (see part 2 of Table 5).

The values of the cv's for each individual of the three species have been calculated from part 1 of Table 5 and Figs. 6 and 7 show the values for the first variate (cv_1) plotted against those for the second (cv_2) for queens and males respectively. A glance at these figures shows that for both queens and males the three species are all well separated by the two variates; each set of individuals forming a distinct cluster for each of the species. The centroid, calculated from the mean values for the original measurements, is marked for each species by a star and a circle that corresponds to the 99% confidence limit around this centroid is also shown. The numbers of individuals in each species group is relatively large compared to the number of measurements made therefore the confidence regions in the two dimensions defined by cv_1 and cv_2 can be approximated to χ^2 with two degrees of freedom. Thus, a 99% confidence interval for each species would be a circle of radius $r = \sqrt[2]{\chi^2}$ (2; 0.01) = $\sqrt[2]{9.21}$ = 3.03. Fig. 7 shows that the 99% confidence circles for males do not overlap