

from a colony in Denmark. Nine *M.sabuleti* males were available from pitfall and one from the Diver Collection, the remaining eighteen being taken from colonies at Durlston. Twenty-eight males of *M.hirsuta* were collected and mounted from the Durlston colonies.

The following characters were measured on a sample of queens and all the males from each of the three species (see Fig. 1 for way in which measurements were made). Head characters were: headwidth, head length, frons width, eye length and scape length (the last was measured only for males because the curvature of the female scape makes measurement difficult). Frons ratio has been used by other authors to separate *M.sabuleti* from *M.scabrinodis* (Collingwood, 1958) and this is calculated here as frons width/headwidth $\times 100$. Thorax width and epinotal spine length were the thoracic characters measured (spines are essentially a female character and were not measured for males). The measurements of the petiolar region were petiole width, post-petiole width and post-petiole height (petiole height was not measured because it is difficult to standardize between species).

An attempt was made to assess the hairiness of an individual in two ways. First, the length of a typical bristle on the back of the head was measured (although the bristles on an individual are quite variable a distinct difference between the species was hoped for). Secondly, the number of hairs on the petiole were counted (the petiole was chosen because it is an easily definable region and has sufficient hairs to make a count worthwhile but not enough to make counting too difficult). The variability in the number of hairs on the petiole for specimens of the three species is illustrated in Fig. 2 and Fig. 4

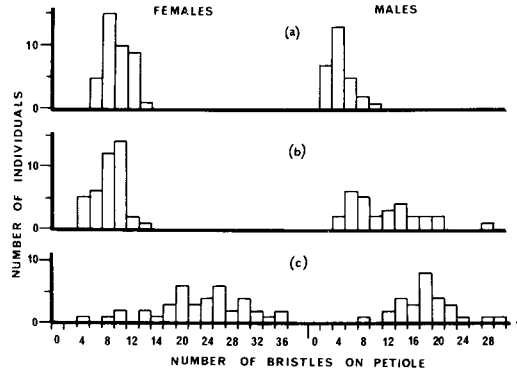


FIG. 4. Frequency histogram of the numbers of bristles on the petiole of the samples of queens and males (grouped in twos): *M.sabuleti* (a), *M.scabrinodis* (b) and *M.hirsuta* (c).

(ii) Examination of all the queens

Initially four measurements were made on all the queens available to see whether the three species could be distinguished by morphometrics. The measurements used were headwidth, head length, frons width and post-petiole width. The means and standard deviations of these four measurements are given in Table 1; comparisons between the species using the 't' test shows that the mean measurements of headwidth, head length and post-petiole width are significantly different ($P < 0.001$). There is no significant difference between the mean frons width of *M.scabrinodis* and *M.sabuleti* but the frons width of *M.hirsuta* differs slightly from the other two ($P = 0.015$). Comparison of subsets of the data for the different species collected from the different sites shows that specimens from every site tend to conform to the following observations. In order to save space the tables of measurements are not given here but if head length is plotted against headwidth, head length appears isometric between the three species. There is an indication that

TABLE 1. Means and standard deviations of the four measurements made on the 143 *M.scabrinodis* queens, 170 *M.sabuleti* queens and 54 *M.hirsuta* queens

	<i>M.scabrinodis</i> (143 individuals)		<i>M.sabuleti</i> (170 individuals)		<i>M.hirsuta</i> (54 individuals)	
	Mean	SD	Mean	SD	Mean	SD
Headwidth (mm)	1.097	0.033	1.195	0.036	1.024	0.054
Head length (mm)	1.216	0.034	1.308	0.034	1.100	0.048
Frons width (mm)	0.414	0.022	0.414	0.022	0.425	0.027
Post-petiole width (mm)	0.568	0.025	0.626	0.028	0.648	0.038