

independent variables, combined the species, and used sex as the single dependent variable (Table 14). The results clearly show that, for adults, analyses based on log-ratio comparisons are less discriminatory than those using the actual measurements or ratios. The necessity of using variables with the same variances in ratio analyses, the danger of comparing dependent variables, and the fact that only adults were being studied, suggest using only actual measurements and a restricted suite of ratios as a basis of comparison throughout most of the remaining analyses.

TABLE 14.—COMPARISON OF ANALYSIS TECHNIQUES (4 Independent Variables, dependent variable sex [n=57]).

	Ratios	Log-ratios	Actual Measurements
Correct	15	9	13
Doubtful (with \pm probable error)	42	48	42
Clearly incorrect	0	0	2

The mean (\bar{X}), standard deviation (SD), and coefficient of variation (CV) of the measured characters were computed (Table 11). Each of the measurements was roughly plotted against plastral or carapace lengths to eliminate the problem of size differences and to estimate regression lines. Of the 46 possibly significant characters, 23 were concerned with carapace shape and 24 with plastron shape. The diagnostic value of each character in distinguishing a pair of species was tested by computing single character distances for the pair, and dividing the difference in means for the two populations by the average standard deviation.

From this analysis 5 carapace and 12 plastral measurements were found to be most diagnostic, although there was overlap between all species pairs in every character studied. These measurements, which were used in the linear discrimination tests, are: carapace length, carapace height, carapace width, distal and proximal widths of pleural 3; plastral length, xiphiplastron length and width, posterior lobe width, epiplastral lip thickness and length, epiplastral bone length and width, entoplastral length and width, and anterior lobe length and width.

The linear discrimination technique has been described and its use explained by Kendall (1951), Jolicoeur (1959), and Lawrence and Bosert (1967). Rao (1952) extended its usefulness through certain clustering statistics. The discrimination tests find the weighted sum of characters that best separates the populations (where the sum = the discrimi-