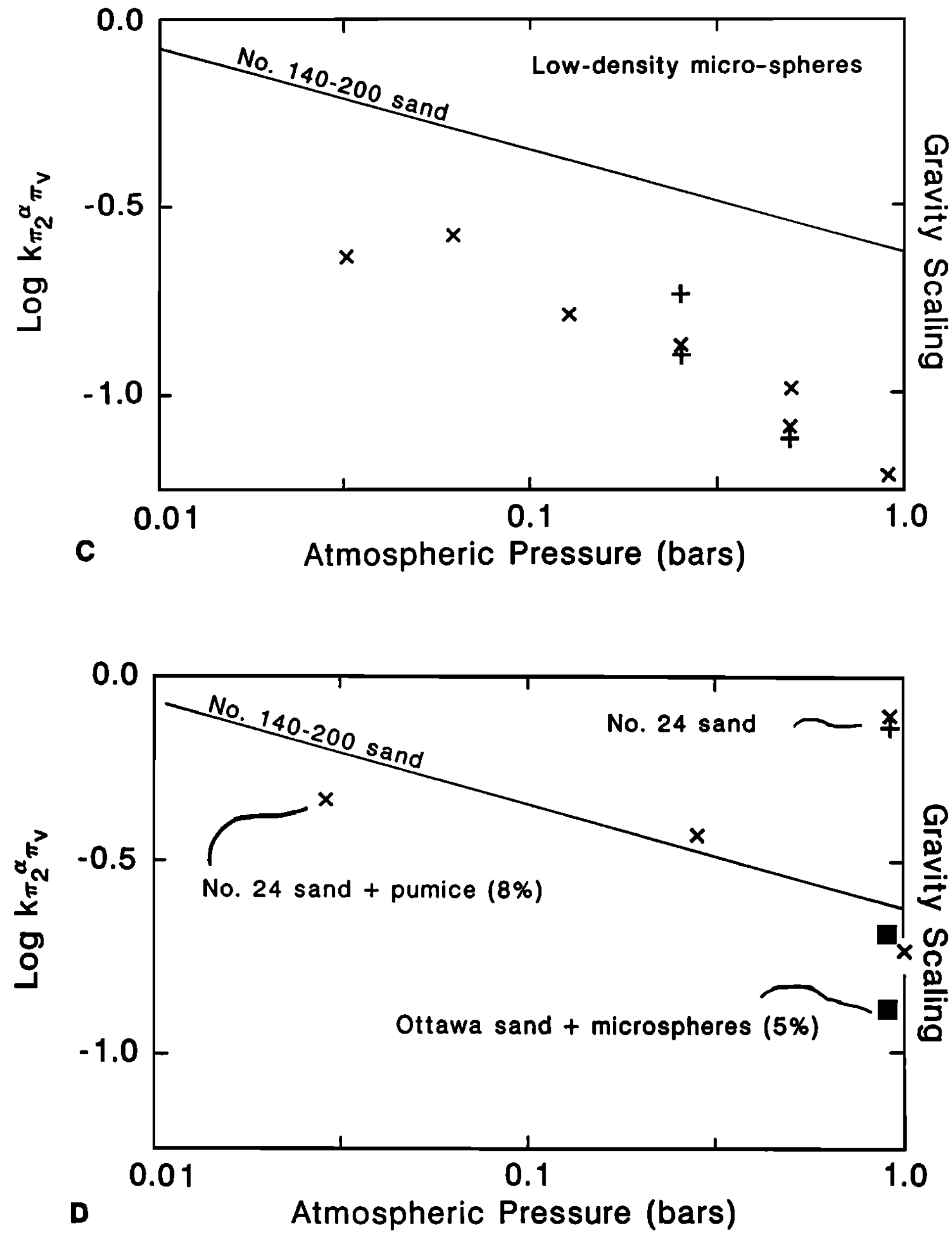

Fig. 2. (continued)

that transitional conditions are avoided or considered to have minor effect. This assumption can be justified by using sufficiently high atmospheric pressures and by comparing different target types over a wide range in conditions.

In each case, an abridged scaling relation retains only those parameters varied in the experiments, thereby focusing attention on the relevant variables. Consequently, invariant parameters or constants should be absorbed in a single constant, which is not always shown. Although this practice leaves ratios that are not dimensionless, it does not affect relative trends and dependencies. This approach will be used throughout following discussion; however, various graphs will include axes with all the controlling variables explicitly shown. It should be noted that equations (10*a*) and (10*b*) predict that the effect of atmospheric pressure should decrease with increasing crater size on a given planet (i.e., given rms impact velocity). In contrast, equation (10*c*) indicates that atmospheric pressure affects craters of all sizes, with impact velocity introducing scatter at a given size. The self-consistent form given by equation (10*d*), however, suggests that the effect of pressure should increase with crater size since $\pi_2^{\alpha/3}$ increases with projectile size for a given velocity.

The appropriate scaling relation among the options in equation (10) can be determined by varying selected variables (r_p, R_v, δ_t, v, and target types) under atmospheric conditions that minimize other processes. Plate 1 revealed that helium even at high atmospheric pressures did not affect ejecta curtain shape, thereby indicating minimal effects from aerodynamic drag (f_e in equation (1)). The use of other gases at lower atmospheric densities also should minimize such effects. Helium has the additional advantage that its high sound speed (c_{He} = 0.965 km/s) and low density should minimize possible