

Seasonal changes in plasma testosterone levels and in various testicular parameters were studied in 41 adult male rock hyrax (*Procavia habessinica*). Among animals collected during the annual breeding season, testis weights and plasma testosterone levels were approximately five times greater than among animals collected outside the breeding season. Light microscopic measurements showed that increase in testis weight was largely due to enlargement of the seminiferous tubules. Histological sampling techniques indicated no significant change in Leydig cell numbers. Leydig cell size increased during the breeding season, and average Leydig cell volume showed significantly positive correlation with plasma testosterone level. With the electron microscope, Leydig cell hypertrophy was seen to involve changes in quantity and structure of several cytoplasmic constituents. Lipid droplets disappeared and smooth endoplasmic reticulum (SER) spread dramatically as the cells increased in size. In contrast to the sparse and heterogeneous assemblage of irregularly tubular and cisternal SER seen in nonbreeding animals, the extensive masses of SER in breeding animals appeared as relatively straight, unbranched tubules of uniform diameter. Peculiar membranous structures, possibly derived from the SER, were abundant in the periphery of Leydig cells from animals with high plasma testosterone levels. These findings suggest that there is a definite relationship between plasma testosterone levels and Leydig cell fine structure in seasonally breeding hyrax.