

Classification of the spermatogenic cycle, seasonal changes of seminiferous tubule morphology, and estimation of the breeding season of the large Japanese field mouse (*Apodemus speciosus*) in Toyama and Aomori Prefectures, Japan

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The large Japanese field mouse, *Apodemus speciosus*, is a potential indicator of environmental stress, but this function has not been confirmed by histological studies. Since environmental stress affects the reproductive function of mice, we determined the reproductive characteristics of this species at two locations: Toyama (36°35'N, 137°24'E) and Aomori (40°35'N, 140°57'E). Mice were captured during May–November (n=119) and July–November (n=146) at these locations, respectively. We classified the breeding season from the numbers of pregnant females and young, in addition to the spermatogenic cycle and seasonal changes in seminiferous tubule morphology of males. Testicular weight was measured, and seminiferous tubule morphology was examined histologically. Fourteen stages were found in the seminiferous epithelium cycle based on acrosome formation and spermatid head morphology. At both locations, the breeding season peaked from late summer to early autumn and possibly in spring. Spermatogenic activity was classified into 4 periods from June to November: resting around June and October–November; resumptive around July; active around August; and degenerative around September. During the resting period, the seminiferous tubules consisted of Sertoli cells, spermatogonia and spermatocytes. Spermatogenesis began during the resumptive period, and spermatids were observed. During the active period, active

spermatogenesis and a broad lumen were observed. During the degenerative period, spermatogenesis ended, and Sertoli cells, spermatogonia, spermatocytes and degenerating exfoliated round spermatids were observed. This study provides scientific information about the testicular histopathological evaluations of the large Japanese field mouse for its use as an index species of environmental pollution.