

NOTES ON REPRODUCTION OF THE WOOLLY OPOSSUM  
(*CALUROMYS DERBIANUS*) IN NICARAGUA

The woolly opossum (*Caluromys derbianus*) is a relatively unknown, nocturnal, arboreal marsupial that lives in tropical forests from southern Mexico to northern South America. The recent discovery that this species has a diploid number of only 14 chromosomes (Biggers *et al.*, 1965) has aroused interest in the use of this animal for experimental studies, and consequently in its reproductive processes. The anatomy of the male and female genital tracts follows the usual marsupial patterns. Some of the unique minor features were described by Hill and Fraser (1925) for the female and by Biggers (1966) for the male. The unusual morphology of the spermatozoa, and their method of pairing in the epididymis, was reported by Biggers and DeLamater (1965). So far, however, it has proved impossible to breed the woolly opossum in captivity, and our current knowledge of its reproduction depends on observations of animals trapped in the wild. Unfortunately the scanty early literature is confusing because of taxonomic uncertainties (Asdell, 1964). In 1964, 20 unequivocally identified specimens of *C. derbianus* were live-trapped in Nicaragua as part of an epidemiological study on leptospirosis. Arrangements were made to preserve the reproductive organs for laboratory study. Observations on the reproductive status of these specimens are summarized in this paper.

Woolly opossums were live-trapped at two locations, Hacienda Calera, Nandaime (lat 11° 45', long 86° 7'), and Hacienda Mecatepa, Granada (lat 11° 47', long 85° 58'), both on the western side of Lake Nicaragua. The animals were weighed and then killed. After samples for the bacteriological study were taken, the reproductive tracts were dissected out and immediately fixed in Bouin's solution. After three days the tracts were transferred to 70% alcohol. Skins and skulls were preserved and sent to Dr. Charles O. Handley, Jr., of the Smithsonian Institution, Washington, D. C., for identification.

Seven specimens of male woolly opossums were trapped and are listed in Table 1. The sexual condition was determined from histological sections of the testes and epididymides. In all six cases listed as mature, spermatozoa were seen in the testes and epididymides. The results show that adult spermatid males are found in February and also in July, August, and September. The fact that a pregnant female (no. 1138, Table 3) was trapped on 31 January indicates that males are also spermatid in January. The mean body weight of the mature males was 328 g, standard deviation 29.6.

Specimen 1137 possessed well-developed seminiferous tubules but no maturation stages beyond spermatogonia were seen. Since the body weight of this specimen is only 75% of the mean body weight of the mature specimens it is classified as immature. In all likelihood it is a young male just reaching puberty. The mean weights of the testes,

TABLE 1.—*Specimens of male woolly opossums (Caluromys derbianus) caught in Nicaragua in 1964.*

No.	Date trapped	Body weight (g)	Sexual condition
<i>Hacienda Calera, Nandaime</i>			
1137	31 January	246	Immature
1141	7 February	385	Mature
1142	7 February	308	Mature
1155	13 February	336	Mature
1504	23 July	310	Mature
1528	4 August	315	Mature
<i>Hacienda Mecatepa, Granada</i>			
1632	23 September	315	Mature

TABLE 2.—Weight of the testes, epididymides, and prostrate gland of the mature woolly opossums (see Table 1).

	Testes (g)	Epididymides (g)	Prostrate (g)
Mean	0.71	0.42	2.33
Standard deviation	0.12	0.093	0.92
Range	0.50–0.85	0.30–0.55	0.95–3.40
n	6	6	6

epididymides, and prostrate glands of the mature specimens are shown in Table 2, together with their ranges and standard deviations.

Thirteen specimens of female woolly opossums were trapped and are listed in Table 3. The sexual condition was determined from gross observations and study of serial sections of the ovaries. Specimens were taken only in two times of the year: January and February, and July and September. In both periods females were caught either bearing or suckling young. Two specimens (nos. 1614, 1615), trapped in September, were immature with small ovaries containing masses of primary follicles. One specimen (no. 1154) contained a regressing corpus luteum although it had no pouch young. This may have been a case where total litter loss had occurred. According to Enders (1966) such litter loss may occur frequently in this species. The remaining specimens had ovaries of the anestrus type (Hartman, 1928) with very few follicles containing antra. No specimens were obtained with large mature follicles typical of the estrous stage. Thus breeding occurs throughout the dry season of the year (January to June), and into the early part of the season of heavy rains (July to December). The onset of the breeding season is coincident with the observations of Enders (1966) in Panama. Whether females continuously nurture young until November, as in the case of two sympatric marsupial species, *Didelphis marsupialis tabascensis* and *Philander opossum* (Biggers, 1966), cannot be determined until further specimens have been collected during the period October through December.

TABLE 3.—Specimens of female woolly opossums caught in Nicaragua in 1964

No.	Date trapped	Body wt (g)	Ovary wt (mg)	Sexual condition
<i>Hacienda Calera, Nandaime</i>				
1138	31 January	407	21	Pregnant
1143	7 February	268	10	Anestrus
1144	7 February	323	15	Lactating—3 pouch young
1154	13 February	244	11	*Lactating
1503	23 July	290	8	Pregnant
1508	27 July	128	5	Anestrus
1510	27 July	338	15	Lactating—2 pouch young
1527	4 August	140	6	Pregnant
<i>Hacienda Mecatepa, Granada</i>				
1579	26 August	370	14	Lactating—3 pouch young
1607	3 September	210	8	Lactating—3 pouch young
1613	8 September	279	8	Anestrus
1614	8 September	62	2	Immature
1615	8 September	66	4	Immature

\* Regressing corpus luteum; probably total litter loss.

TABLE 4.—*Pouch young of specimens of the woolly opossum.*

No. female	No. young	Mean wt (g)	Mean snout-rump length (cm)
1144	2 ♀; 1 ♂	1.6	5.13
1510	2 ♀	3.1	6.55
1579	1 ♀; 2 ♂	6.4	8.1
1607	2 ♀; 1 ♂	1.6	5.3
Total	7 ♀; 4 ♂		

The litter size in this restricted collection of pouch young is two or three, with a median value of three. The one specimen in advanced pregnancy (no. 1138) contained two fetuses in the uterus. Hall and Dalquest (1963) reported a specimen containing three pouch young, and Enders (1966) reported the litter size to be one to six with an average of three to four.

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