

February 1979

EMBRYO REJECTION IN THE PINE VOLE

Kenneth J. Marks
Union College

Margaret Horsfall Schadler
Union College

Follow this and additional works at: <http://digitalcommons.unl.edu/voles>



Part of the [Environmental Health and Protection Commons](#)

Marks, Kenneth J. and Schadler, Margaret Horsfall, "EMBRYO REJECTION IN THE PINE VOLE" (1979). *Eastern Pine and Meadow Vole Symposia*. 153.

<http://digitalcommons.unl.edu/voles/153>

This Article is brought to you for free and open access by the Wildlife Damage Management, Internet Center for at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Eastern Pine and Meadow Vole Symposia by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

EMBRYO REJECTION IN THE PINE VOLE.

Kenneth J. Marks
Margaret Horsfall Schadler
Department of Biological Sciences
Union College
Schenectady, New York. 12308

When a pregnant pine vole is placed in a cage with a strange (unfamiliar) male, one that did not cause her pregnancy, this female goes into "heat", indicating she has rejected the embryos she was carrying. This pine vole can later be impregnated by the strange, or second male.

This phenomenon of pregnancy termination, called the "Bruce effect", was first noticed by Hilda Bruce, who saw it occur in laboratory mice. Many investigators have noted it in a variety of laboratory mice, deer mice, and other species of voles.

We set out to see if the Bruce effect was reproducible in pine voles. The following observations were made:

We placed 25 mature virgin females in separate cages each with a stud male. All of them were impregnated by the stud male after 3 to 5 days. Daily vaginal smears were taken on all females and pregnancy was determined by observation of sperm in the smear. Four days after sperm were seen, the stud male was removed and replaced with a strange male. Daily vaginal smears taken at this time showed 21, or 84%, of the females, went back into heat and mated with the strange male within 2 to 4 days. The pine vole does not go into heat or mate when she is pregnant. Hence the fact that these females went into heat and mated with the strange males, clearly showed they had rejected the embryos sired by the stud males.

Litters of the experimental females that rejected their embryos were born about 24 days after the strange male mating (which is the normal gestation period) and, about 31 days after the stud male mating. (See Table One.) This offers additional evidence for rejection of the original embryos because a gestation period of 31 days does not happen in the pine vole.

Sixteen control females were mated with stud males only. Daily vaginal smears indicated impregnation by the stud male within 3 to 5 days after animals were placed together. These females did not go back into heat after the original mating. Litters of these females were born 24 days after sperm was seen in their vaginal smears. Clearly, embryo rejection does not occur commonly in the absence of a strange male.

These experiments offer clear evidence that the Bruce effect operates in the pine vole.

TABLE ONE

Comparison Of Control Versus Experimental Females.

Group	Number of Mated Females.	Number of Females Rejecting Their Embryos.	Average Number of Days After Stud Mating to Litter Birth.	Average Number of Days After Strange Mating to Litter Birth.
CONTROL	16	---	24	-----
EXPERIMENTAL	25	21	30.6	23.8