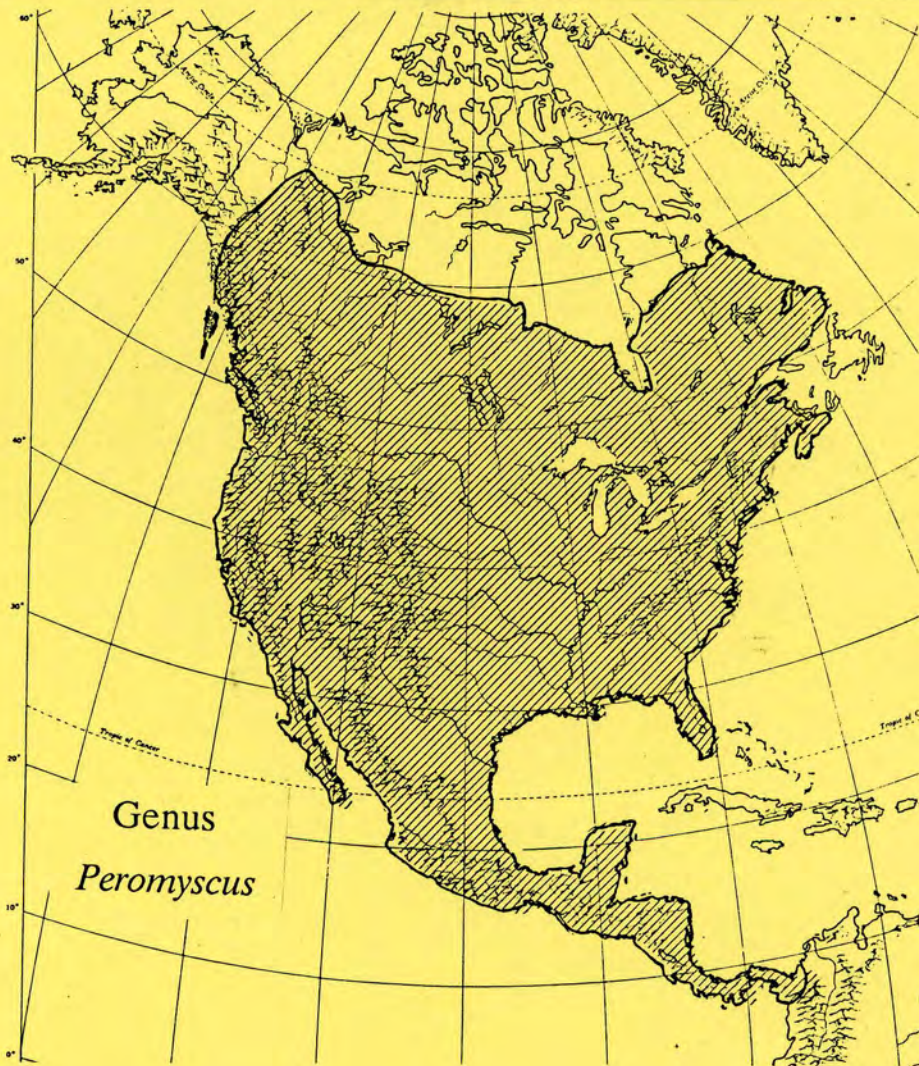


# PEROMYSCUS NEWSLETTER

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NUMBER FOURTEEN

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SEPTEMBER 1992

PEROMYSCUS  
NEWSLETTER

Cover: Range of Genus *Peromyscus* (*sensu lato*)  
based on Hall (1981), Carleton (1989)  
and other sources. (See page 11)



SEPTEMBER 1992

## ISSUE NUMBER FOURTEEN

Sorry we are somewhat behind schedule on this issue. Thank you for your patience!

In *PN* #14 you will find an updated list of formally described genetic loci in *Peromyscus*. This list is published in alternate issues and includes any changes recommended by the Genetic Advisory Committee for the genus.

Also included, as usual, is a list of holdings in the *Peromyscus* Genetic Stock Center. Please note that we have found it necessary to increase our user fees to \$ 10 per animal. This represents the first increase in our seven years of operation, despite continually increasing costs of animal care provided by the University's Animal Resources Facility. At least a portion of the increase can be attributed to protection from animal rights activists. A security system was recently installed in all of our facilities, and there has been an increasing amount of paperwork necessary to "cover our rear" from legal harassment by animal activists. The extra personnel to handle administrative costs adds to the expenses of animal care.

The Stock Center animals continue to be healthy and vigorous. We routinely screen for common murine pathogens, and the stocks are consistently negative. All stocks are also negative for Lyme disease.

Questions about our outbred, closed colony wild-type stocks occasionally arise. What is our breeding system and how inbred are they? The level of inbreeding varies among stocks depending upon the number of founders, "bottlenecks" in the history of the stock and random decay of variability. Nevertheless, we attempt to maintain heterogeneity in each stock, which is confirmed by allozymic polymorphism and failure to retain skin allografts. In establishing paired matings, sib and parent-offspring mating is avoided, but the animals are otherwise mated without deliberate bias or selection, except to assure that the maximum feasible number of parentages are represented at each generation. We will be happy to answer questions about specific stocks.

..... And, speaking of wild-type stocks, we are now able to provide *P. californicus*. This stock is representative of the subspecies *insignis* from the Santa Monica mountains near Los Angeles. The stock was initiated from animals kindly provided by David Gubernick of the University of Wisconsin.

Please continue to send your informal reports for our "Contributions" section. Each entry should be limited to two single-spaced pages. Entries will be published verbatim, with editing only for format. We limit photos, drawings and tables to one per entry max. Since PEROMYSCUS NEWSLETTER is not a formal publication and reports often contain tentative or preliminary results, entries in the "Contributions" section should not be cited in other publications without prior consent of the contributor.

Deadline for *PN* #15 is 15 March 1993.

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Columbia SC 29208

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# C O N T E N T S

In Newsletter Fourteen .....	1
News, Comment and Announcements .....	4
The <i>Peromyscus</i> Genetic Stock Center .....	6
The Aiken Behavior Mutant Center .....	10
Where the <i>Peromyscus</i> are .....	11
<i>Peromyscus</i> Gene List .....	12
Contributions (Arranged alphabetically) .....	20
Recent <i>Peromyscus</i> Publications .....	29

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## NEWS, COMMENT and ANNOUNCEMENTS

Special thanks to **David Gubernick** of University of Wisconsin for providing us with breeding pairs of *P. californicus*. These animals will allow us to supply this species from the Stock Center. Also, apologies to Dave for misspelling his name in our last issue.

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There were 18 papers and posters on *Peromyscus* presented at the annual meeting of the American Society of Mammalogists at Salt Lake in June.

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**Mark Crew** has moved to the Department of Medicine and Biochemistry at Little Rock AR. Mark has been active in elucidating the MHC complex in *P. leucopus*.

\* \* \*

Letters received from -

- \*\*\* **Dorcas MacClintock**, who sent us an article on B. Elizabeth ("Betty") Horner from the Smith College Alumnae Quarterly. The article nicely parallels our "*Peromyscus* Pioneer" account on Dr. Horner in the March issue of PN.
- \*\*\* **Bob Rose** of Old Dominion University. Bob says some generous things about PN, and we appreciate that! He also notes that an interesting population of meadow vole with some bi-colored specimens was located near Pittsburg PA by a high school teacher. These animals have a white head and grayish collar, but are otherwise typical. Anyone interested in learning more about these may want to contact Bob at ODU or Rich Yahner at Penn State.
- \*\*\* **Bob Robbins**, now at the Genome Data Base housed at Johns Hopkins School of Medicine. Relative to our comment in the last PN, he wants to amend his comment about the "nostalgic smell of a mouse room" to read, understandably, "*Peromyscus* mouse room"

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### ON THE NEWSSTAND:

Item - **Jerry Wolff's** finding that Appalachian *Peromyscus* population cycles correspond to acorn sets on a 3-4 year basis is reported in the November issue of *DISCOVER*. The piece includes a photograph of a white-footed mouse in mid-leap.

Item - The September issue of *NATIONAL GEOGRAPHIC* quotes **Clement Markert** in a feature on bioengineering of the Chinese Meishan pig. Clem is Acting Chairman of the Advisory Committee for the *Peromyscus* Genetic Stock Center, and has a long-time interest in deer mice.

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**ANNOUNCEMENT**

Live *Peromyscus melanophrys*

Available Next Year

The colony of *Peromyscus melanophrys* at the Michigan State University Museum is to be dispersed sometime during the 1992-93 academic year. Anyone who would want living or dead specimens should contact **Dr. Richard W. Hill, MSU Museum, Michigan State University, East Lansing MI 48824**. The only cost will be for shipping.

The colony is descended from 10 or so pairs collected at two locations in the late 1970's. It has been random-bred. Current breeding is good to fair. Health is excellent.

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We understand that the new *Peromyscus* karyotype standard is being finalized by Ira Greenbaum and his associates. The new standard will provide a better frame of reference for cytogenetic and gene mapping studies.

.....

**A new bibliography from Bruce Buttler.....** Bruce is in the process of preparing a new bibliography on "Reproduction in *Peromyscus*" and has a preliminary version. Anyone interested in obtaining a copy should contact Bruce c/o Biology Department, Canadian Union College, College Heights, Alberta T0C 0Z0.

\*\*\*\*\*

WE WERE SADDENED TO LEARN OF THE RECENT DEATH OF MARIE LAWRENCE. MARIE, A MEMBER OF THE STAFF OF THE AMERICAN MUSEUM OF NATURAL HISTORY, WAS HIGHLY RESPECTED BY MAMMALOGISTS WORLDWIDE.

\*\*\*\*\*

A recent report in the *New York Times* describes a study by Joan Blom and Randy Nelson (Johns Hopkins University) showing that deer mice exposed to simulated long day length appeared to be more susceptible to DMBA-induced cancers than those maintained on short day light cycles. They speculated that the effect might be due to melatonin release. Melatonin is known to inhibit growth of some cancer cells.

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## PEROMYSCUS STOCK CENTER

**What is the Stock Center?** The deer mouse colony at the University of South Carolina has been designated a genetic stock center under a grant from the Special Projects Program of the National Science Foundation. The major function of the Stock Center is to provide genetically characterized types of **Peromyscus** in limited quantities to scientific investigators. Continuation of the center is dependent upon significant external utilization, therefore potential users are encouraged to take advantage of this resource. Sufficient animals of the mutant types generally can be provided to initiate a breeding stock. Somewhat larger numbers, up to about 50 animals, can be provided from the wild-type stocks.

A user fee of **\$10 per animal** is charged and the user assumes the cost of air shipment. Animals lost in transit are replaced without charge. Tissues, blood, skins, etc. can also be supplied at a modest fee. Arrangements for special orders will be negotiated. Write or call for details.

### Stocks Available in the Peromyscus Stock Center:

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WILD TYPES	ORIGIN
<i>P. maniculatus bairdii</i> (BW Stock)	Closed colony bred in captivity since 1948. Descended from 40 ancestors wild-caught near Ann Arbor MI
<i>P. polionotus subgriseus</i> (PO Stock)	Closed colony since 1952. Derived from 21 ancestors wild-caught in Ocala Nat'l. Forest FL. High inbreeding coefficient.
<i>P. polionotus leucocephalus</i> (LS Stock)	Derived from beachmice wild-caught on Santa Rosa I., FL. and bred by R. Lacy. Third to sixth generation in captivity.
<i>P. leucopus</i> (LL Stock)	Derived from 38 wild ancestors captured between 1982 and 85 near Linville NC. Seventh to ninth generations in captivity.
<i>P. californicus insignis</i> (IS Stock)	Derived from about 60 ancestors collected between 1979 and 87 in Santa Monica Mts. CA. Fifth to ninth generation in captivity.
<i>P. maniculatus</i> X <i>P. polionotus</i> F <sub>1</sub> Hybrids	Sometimes available.



MUTATIONS AVAILABLE FROM THE STOCK CENTER

<u>Coat Colors</u>	<u>ORIGINAL SOURCE</u>
Albino <i>c/c</i>	Sumner's albino deer mice (Sumner, 1922)
Ashy <i>ahy/ahy</i>	Wild-caught in Oregon ~ 1960 (Teed <i>et al.</i> , 1990)
Black (Non-agouti) <i>a/a</i>	Horner's black mutant (Horner <i>et al.</i> , 1980)
Blonde <i>bl/bl</i>	Mich. State colony (Pratt and Robbins, 1982)
Brown <i>b/b</i>	Huestis stocks (Huestis and Barto, 1934)
Dominant spotting <i>S/-</i>	Wild caught in Illinois (Feldman, 1936)
Gray <i>g/g</i>	Natural polymorphism From Dice stocks (Dice, 1933)
Ivory <i>i/i</i>	Wild caught in Oregon (Huestis, 1938)
Pink-eyed dilution <i>p/p</i>	Sumner's "pallid" deer mice (Sumner, 1917)
Platinum <i>pt/pt</i>	Barto stock at U. Mich. (Dodson <i>et al.</i> , 1987)
Silver <i>si/si</i>	Huestis stock (Huestis and Barto, 1934)
White-belly non-agouti <i>a<sup>w</sup>/a<sup>w</sup></i>	Egoscue's "non-agouti" (Egoscue, 1971)
Wide-band agouti <i>A<sup>Nb</sup>/-</i>	Natural polymorphism Univ. Michigan stock (McIntosh, 1954)
Yellow <i>y/y</i>	Sumner's original mutant (Sumner, 1917)

Note: Some of the coat color mutations are immediately available only in combination with others. For example, silver and brown are maintained as a single "silver-brown" double recessive stock. Write the Stock Center or call (803) 777-3107 for details.

MUTATIONS AVAILABLE FROM THE STOCK CENTER (continued)

<u>Other Mutations and Variants</u>	<u>ORIGIN</u>
Alcohol dehydrogenase negative <i>Adh<sup>o</sup>/Adh<sup>o</sup></i>	South Carolina BW stock (Felder, 1975)
Alcohol dehydrogenase positive <i>Adh<sup>f</sup>/Adh<sup>f</sup></i>	South Carolina BW stock (Felder, 1975)
**Boggler <i>bg/bg</i>	Blair's <i>P. m. blandus</i> stock (Barto, 1955)
Cataract-webbed <i>cwb/cwb</i>	From Huestis stocks. (Anderson and Burns, 1979)
**Epilepsy <i>ep/ep</i>	U. Michigan <i>artemisiae</i> stock (Dice, 1935)
Flexed-tail* <i>f/f</i>	Probably derived from Huestis flexed-tail (Huestis and Barto, 1936)
Hairless-1 <i>hr-1/hr-1</i>	Sumner's hairless mutant Sumner (1924)
Hairless-2 <i>hr-2/hr-2</i>	Egoscue's hairless mutant (Egoscue, 1962)
**Juvenile ataxia <i>ja/ja</i>	U. Michigan stock (Van Ooteghem, 1983)

Enzyme variants. Wild type stocks given above provide a reservoir for several enzyme and other protein variants. See Dawson *et al.* (1983).

\*Available only on pink-eye dilution background.

\*\*Available from Behavior Mutant Center (See p. 10)

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**Other Resources of the *Peromyscus* Genetic Stock Center:**

Preserved or frozen specimens of types given above.

Tissues, whole blood or serum of types given above.

Flat skins of mutant coat colors or wild-type any of the species above.

Reference library of more than 1700 reprints of research articles and reports on *Peromyscus*. Copies can be xeroxed and mailed.

.....  
Limited numbers of other stocks, species, mutants and variants are on hand, or under development, but are not currently available for distribution. For additional information or details about any of these mutants or stocks contact: Janet Crossland, Colony Manager, *Peromyscus* Stock Center, (803) 777-3107.

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## INBRED PEROMYSCUS

The Stock Center has acquired the inbred lines of *P. maniculatus bairdii* developed by Muriel Davisson and others at Jackson Laboratory. These lines are closely related and each is derived from more than twenty sib-mated generations, hence they are "highly" inbred. Two of the lines were separated at the 15th sib-mated generation and represent closely related, but separate lines, and are currently designated PmH1 and PmH8. Lines of H8 were split subsequent to generation I<sub>20</sub> and, hence, constitute sublines of H8. The Stock Center is in the process of further development of these lines. Small numbers (c. 5) of either of the two distinct lines (H1 and H8) are available from the stock center on a limited basis. We suggest that these animals may be useful in molecular or other genetic investigations where a uniform genome is desirable. It is anticipated that greater numbers will be available in the future as production stocks are established. Please contact the Stock Center for more information.

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## PEROMYSCUS MOLECULAR BANK

Materials are now available through the *Peromyscus* Molecular Bank of the Stock Center. Allow two weeks for delivery.

Purified DNA from fresh and/or frozen tissues of following species:

<i>P. maniculatus</i>	<i>P. leucopus</i>	<i>P. aztecus</i>	<i>P. californicus</i>
<i>P. polionotus</i>	<i>P. gossypinus</i>		
<i>P. melanotis</i>			

Genomic DNA libraries:

*P. maniculatus* (Source: M. Felder)  
*P. leucopus* (Source: M. Crew)

cDNA libraries:

*P. maniculatus* liver (Source: M. Felder)

DNA Probes:

LINE1 element probes pDK55 and pDK62  
(Source: D. Kass from *P. maniculatus* genomic library)

Adh-1 (cADHF72) and Adh-3 (cADHF65) probes  
(Source: M. Felder from *P. maniculatus* cDNA library)

Additional materials soon to be acquired. Please call with inquiries.

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Peromyscus Genetic Stock Center  
University of South Carolina  
Columbia SC 29208  
(803) 777-3107

## PEROMYSCUS BEHAVIOR MUTANT CENTER

A Special Stock Center for behavior mutants of deer mice currently is housed at the University of South Carolina-Aiken. The following variants are available from this center.

### CONVULSIVE MUTANTS:

Four different convulsive mutants are maintained. Of these four, only two, Chemogenic Convulsive (*CNV*) and Epilepsy (*ep*), have been formally described in the literature.

**Alamogordo Convulsive (*ALG*).** Affected animals are convulsive after about three months of age and throughout life, with convulsions gradually increasing in severity. In severe seizures, these animals are likely to arch the head and back, to the point of falling over backwards in spasm. This latter behavior is more common in older animals.

**Chemogenic Convulsive (*CNV*).** Affected animals are convulsive from about one month of age and throughout life, with convulsions gradually increasing in severity. *CNV*<sup>-</sup> mutants tend to display convulsive behavior more readily than *ALG*<sup>-</sup> mutants, however the episode is likely to be much less severe.

**Epilepsy (*ep*).** Convulsions can be elicited in these animals from about twenty-one days of age. These animals usually grow deaf however by about three months of age, and thereafter can no longer be made to convulse. A "waltzing" behavior is often seen in these animals. Differences in the Organ of Corti and the central auditory pathway are associated with this mutation.

**Thompson Falls Convulsive (*tf*).** Homozygotes convulse throughout life and do not grow deaf. "Waltzing" is not commonly seen. The seizure pattern has a slightly later onset (about three months) and tends to be more severe, sometimes resulting in death.

### AGE-DEPENDENT ATAXIAS:

**Boggler (*bg*).** This is an autosomal recessive mutation characterized by increasing ataxia, tremor, and loss of fine motor coordination. Additional findings suggest that diminished tactile responsiveness also occurs with advancing age. These deficits are correlated with axonal dystrophy and neuronal loss in the CNS.

**Juvenile Ataxia (*ja*).** This is an autosomal recessive mutation which exhibits a marked ataxia from the time locomotor activity first begins until about forty-five days of age. The phenotype appears to be exaggerated or ameliorated by changes in dietary carbohydrates. Neuronal changes and loss is evident by 120 days of age.

For information about any of these variants, please contact:

Dr. Suellen A. VanOoteghem  
Department of Anatomy  
School of Medicine  
University of West Virginia  
Morgantown WV 26506  
(304) 284-5443

## WHERE *PEROMYSCUS* ARE ...

*Peromyscus*\* are virtually ubiquitous throughout the North American continent, there being very few areas from which they are totally absent. One or another of the fifty or sixty-odd species is found in nearly every major habitat from the tropics to the tundra, from Labrador to Alaska, from Florida to Baja California. As the map on the cover indicates, the only extensive area of the continent from which animals of the genus are missing is northern-most Canada and much of Alaska.

So, set out your Sherman traps anywhere north of the isthmus and south of the 60th parallel and be soon rewarded with a deer mouse or close ally? But wait a minute! There may be a few localities where it is not so simple. Small coastal and lake islands may or may not have resident *Peromyscus* depending on the incertitudes of chance colonization. Perhaps, some mountaintops well above the treeline may lack them; but, nevertheless, there are many alpine sites where they do occur. Maybe they are absent from salt flats or other places of extreme aridity. But on the whole, there are few sites in North America where they are altogether missing.

What about major urban areas? Certainly, in the suburbs of most cities throughout the continent *P. leucopus*, *P. maniculatus* or a close cousin is not uncommon. But can they survive in the central Manhattan ecosystem? A few years ago Richard Stalter of St. Johns University reported a white-footed mouse trapped on a playground near downtown Big Apple. Is there a population in Central Park? If any of our readers know, that will be interesting to report in a future issue of *PN*.

How well mapped is the northern margin of the range, particularly in southern Alaska? A wildlife biologist once informed us that he thought that *P. maniculatus* occurred up the Alaska coast as far as Anchorage. Any confirmation of that impression? Perhaps our readers can enlighten us.

\* Used in the plural sense of individual animals, and taxonomically *sensu* Hall (1981)

# GENETIC LOCI IN THE DEER MOUSE

(*Peromyscus maniculatus*)

Table I. lists recognized genetic loci described in *Peromyscus maniculatus* or other species of the *maniculatus*-group. Table II. lists loci formally described in the *P. leucopus* species group, and Table III. those of other species of *Peromyscus*. These lists are limited to loci for which formal mendelian analysis has been conducted and appropriately reported in the published scientific literature, and/or for which nucleic acid sequences have been published. Additional genetic traits are known some of which have been cited in abstracts, casual reports, newsletters, grant proposals, papers presented at meetings *etc.* The latter are not included, since the descriptions and genetics are generally insufficient to formally define the loci. Presumptive loci described from natural polymorphisms in the absence of formal genetic analysis are not listed here. Protein electrophoretic and other biochemical or immunological variants known in natural populations are listed elsewhere (See PN # 8 pp. 14-26 and # 9 pp. 19-22).

Standardization of genetic nomenclature for *Peromyscus* is a function of the Genetic Advisory Committee for the genus. The following guidelines are applied:

1. To the maximum extent feasible, *Peromyscus* genetic nomenclature and conventions will be consistent with those used for other mammalian species, particularly mouse (*Mus*). Where homology is evident or very likely, the same locus name and symbol is employed. Because homology among alleles is more difficult to ascertain, allelic symbols (superscripts) do not necessarily correspond to those of other species.

2. Dominant and incompletely dominant variant or mutant genes are designated with the first letter of the symbol capitalized. Recessive variant or mutant genes are indicated in lower case letters. The wild-type (normal or standard) allele for morphological, pelage color and behavioral traits, when recognized, is symbolized with a "+" sign. Electrophoretic allelic variants of proteins or subunits are indicated by superscripts in alphabetical sequence, except for null alleles which are designated, with an "o" superscript; or, in some cases, by relative mobility with reference to a standard mobility "100". Restriction fragment length variant alleles are designated by a numerical sequence or size in kilobases. Distinct loci with similar phenotypic effects may be indicated in a hyphenated numerical or alphabetical series.

3. Symbols published by the original investigator are given priority, unless there is clear homology with *Mus* loci, except for certain loci for which the original symbol was retained under the "grandfather" principle and because of prior use in the literature. If an original symbol is in conflict with an established one for *Mus*, the equivalent *Mus* symbol is given preference. In cases where the original symbols have been superseded by subsequent common usage, the latter has been adopted. If a variant is shown to be allelic with a previously reported gene, the locus symbol is reduced to an allelic symbol. Where two authors have used the identical symbol for different loci in *Peromyscus*, priority is given to the first reported, and an alternate designation is devised for the other. (In Table I previously published obsolete names and symbols are listed in parentheses.)

4. Presumed loci described solely on the basis of variation observed among individuals in the absence of convincing mendelian or molecular analysis are not considered to be formally established and are not included in these tables.

5. Linkage assignments are subject to updates of the *Peromyscus* linkage map.

I. Genetic Loci Formally Described in the *Peromyscus maniculatus* Species Group:

a. Coat and Eye Pigmentation and Pattern Variants.

Name of locus and allelic variants	Symbol	Mode of inheritance <sup>1</sup>	Linkage group	Definitive description and analysis	Collateral descriptions, interactions and recurrences	Recombination reported
AGOUTI			III			
Wide-band agouti	A <sup>Nb</sup>	dominant		McIntosh (1956a)	Blair (1947) as "buff"	Clark (1938) "buff"
White-belly non-agouti	a <sup>w</sup>	recessive		Egoscue (1971)		
Non-agouti (Black)	a	recessive		Horner <i>et al.</i> (1980)		
ASHINESS	ahy	recessive		Teed <i>et al.</i> (1990)		
BROWN	b	recessive	II	Huestis and Barto (1934)	Blair (1947), McIntosh (1956a), Dawson <i>et al.</i> (1969)	Huestis and Barto (1934), Blair (1947), Barto (1955, 1956), McIntosh (1956a)
Orange-tan	b <sup>ot</sup>	recessive		Egoscue and Day (1958)		
BLONDE <sup>2</sup>	bln (bl)	recessive		Pratt and Robbins (1982)		
ALBINO	c	recessive	I	Sumner (1922)	Clark (1938)	Sumner (1922), Clark (1936, 1938), Feldman (1937), Barto (1942a), Huestis and Lindstedt (1946), Huestis (1946)
COLORLESS HAIR TIP*	ctp	recessive		Bowen and Dawson (1969)	Bowen (1968)	
DILUTE*	d	recessive	II	Dice (1933)		Clark (1938), Barto (1942a, 1956), McIntosh (1956a)
GRAY	g	recessive		Dice (1933)	Clark (1938), Blair (1947), McIntosh (1956a)	Blair (1944, 1947)
IVORY	i	recessive		Huestis (1938)	Clark (1938)	Barto (1942a, 1956), McIntosh (1956a)
PINK-EYED DILUTION	p	recessive	I	Sumner (1917) as "pallid"	Clark (1938), Barto (1942b)	Sumner (1922), Clark (1936, 1938), Feldman (1937), Snyder (1980a)
PLATINUM <sup>2</sup>	pit (pt)	recessive		Dodson <i>et al.</i> (1987)		Dodson <i>et al.</i> (1987)
RED EYE <sup>2</sup> (Heterochromia)	rde (r)	recessive		Huestis and Willoughby (1950)		
DOMINANT SPOT (Whiteface)	S	dominant		Feldman (1936)		Feldman (1937)
SILVER	si (sf)	recessive	I	Huestis and Barto (1934)		Huestis and Barto (1934), Huestis and Piestrak (1942), Huestis and Lindstedt (1946), Barto (1956)

(Continued)

a. Coat and Eye Color Variants (Continued)

Name of locus and allelic variants	Symbol	Mode of inheritance <sup>1</sup>	Linkage group	Definitive description and analysis	Collateral descriptions, interactions and recurrences	Recombination reported
WHITE CHEEK <sup>2</sup>	<i>Wck</i> ( <i>Wc</i> )	dominant		Blair (1944)	Bowen and Dawson (1977)	Blair (1944)
WHITESIDE <sup>2</sup>	<i>ws</i> ( <i>wh</i> )	recessive		McIntosh (1956b)		
YELLOWING <sup>2</sup> (Yellow)	<i>y</i>	recessive		Sumner (1917)	Sumner and Collins (1922), Clark (1938), McIntosh (1956a)	Sumner (1922), Feldman (1937), Barto (1956), McIntosh (1956a)
<b>Complexly inherited coat pattern traits:</b>						
Minor white spotting (Star, splash, etc.)	<i>p-1, p-2</i>	recessive incompletely penetrant		Feldman (1936)	Sumner (1932), Barto and Huestis (1933)	
Grizzled <sup>2</sup>	" <i>Gr</i> " ( <i>G</i> )	"complex dominant"		Sumner (1928, 1932)		
Coat pattern in <i>P. polionotus</i>				Bowen and Dawson (1977)	Bowen (1968)	Bowen and Dawson (1977)
Pointed A <sup>2</sup>	<i>Pt-A</i> ( <i>P<sub>A</sub></i> )	dominant	VII			
Pointed B <sup>2</sup>	<i>Pt-B</i> ( <i>P<sub>B</sub><sup>A</sup></i> )	dominant	VII			
Tapered <sup>2</sup>	<i>Tpt</i> ( <i>Tp</i> )	dominant				
Coat pattern modifiers				Bowen and Dawson (1977)		
Squared modifier <sup>2</sup>	<i>Msq</i> ( <i>Rs</i> )	incompletely dominant				
Tapered modifier <sup>2</sup>	<i>Mtp</i> ( <i>Rt</i> )	dominant				

<sup>1</sup>Autosomal unless otherwise stated.

<sup>2</sup>Name or symbol changed to avoid confusion with designations in *Mus*. Obsolete published names and symbols in parentheses.

\*No longer known to be in existence



b. Integumentary, Skeletal and Pathological Variants.

Name of locus	Symbol	Mode of inheritance <sup>1</sup>	Linkage group	Definitive description and analysis	Collateral descriptions, interactions and recurrences	Recombination reported
CATARACT-WEBBED <sup>2</sup> (Syndactyly)	<i>cwb</i> ( <i>cw</i> )	recessive		Anderson and Burns (1979)		
FLEXED TAIL	<i>f</i>	recessive	I	Huestis and Barto (1936a)		Huestis and Barto (1936a), Huestis and Piestrak (1942), Huestis and Lindstedt (1946), Huestis <i>et al.</i> (1956), Barto (1956)
HAIRLESS-1	<i>hr-1</i>	recessive		Sumner (1924)		Sumner (1924, 1932), Feldman (1937), Clark (1938), Barto (1942a, 1955, 1956), McIntosh (1956a)
HAIRLESS-2	<i>hr-2</i>	recessive		Egoscue (1962)	Knapp and Dawson (1991)	
NUDE* <sup>2</sup> (Post-juvenile nude)	<i>nd</i> ( <i>n</i> )	recessive		Clark (1938)	Barto (1942a)	
SPHEROCYTOSIS (Inherited jaundice)	<i>sph</i>	recessive		Huestis and Anderson (1954)	Huestis <i>et al.</i> (1956), Motulsky <i>et al.</i> (1956)	Huestis <i>et al.</i> (1956)

c. Behavior and Neurological Variants.

Name of locus	Symbol	Mode of inheritance <sup>1</sup>	Linkage group	Definitive description and analysis	Collateral descriptions, interactions and recurrences	Recombination reported
BOGGLER <sup>2</sup>	<i>bgl</i> ( <i>bg</i> )	recessive		Barto (1955)	Vandermeer and Barto (1969)	Barto (1955)
EPILEPSY <sup>2</sup> (EP; waltzing in <i>artemisiae</i> )( <i>e*</i> , <i>ep</i> , <i>v<sub>2</sub></i> )	<i>epi</i>	recessive		Dice (1935)	Clark (1938), Watson (1939), Chance and Yaxley (1950), Barto (1954, 1956)	Watson (1939), Barto (1956)
JUVENILE ATAXIA <sup>2</sup>	<i>jtx</i> ( <i>ja</i> )	recessive		Van Ooteghem (1983)		
SPINNER* <sup>2</sup> (Waltzing in <i>rhoadsi</i> )	<i>spn</i> ( <i>sp</i> , <i>v<sub>3</sub></i> )	recessive		Watson (1939)	Barto (1954)	
TREMOR*	<i>tr</i>	recessive		Huestis and Barto (1936b)		
WALTZER* (Waltzing in <i>bairdii</i> )	<i>v</i> ( <i>w</i> )	recessive	III	Dice (1935)	Clark (1938), Watson (1939), Dice <i>et al.</i> (1963)	Barto (1942a, 1954, 1956), McIntosh (1956a)

<sup>1</sup>Autosomal unless otherwise stated.

<sup>2</sup>Name or symbol changed to avoid confusion with designations in *Mus*. Obsolete published names and symbols in parentheses.

\*No longer known to be in existence

d. Biochemical and Immunological Variants.

Name of locus	Allelic designation	Linkage group	Definitive description and formal analysis	Recombination reported
ALCOHOL DEHYDROGENASE (liver)	$Adh-1^f$ $Adh-1^s$ $Adh-1^o$	VI	Felder (1975), Burnett and Felder (1978a, 1978b)	Dawson <i>et al.</i> (1983)
ALBUMIN (serum)	$Alb^{100}$ $Alb^{86}$ $Alb^{85}$	VI	Brown and Welser (1968), Jensen and Rasmussen (1971)	Dawson (1982), Dawson <i>et al.</i> (1983)
AMYLASE (salivary)	$Amy-1^a$ $Amy-1^b$ $Amy-1^c$	VI	Evans <i>et al.</i> (1977)	Dawson <i>et al.</i> (1983)
ERYTHROCYTIC ANTIGEN	$Ea^A = (Pm^A)$ $Ea^B = (Pm^B)$ $Ea^C = (Pm^C)$	IV	Rasmussen (1961), Savage and Cameron (1971)	Randerson (1973)
ESTERASE (erythrocytic) <sup>2</sup>	$Es-3^o$ ("Es-1") $Es-3^a$ $Es-3^b$ etc.	IV	Randerson (1965), Van Deusen and Kaufman (1978)	Randerson (1973)
ESTERASES (tissue and serum)	$Es-1$ through $Es-7$ (Symbols not standardized)	VIII	Rasmussen and Jensen (1971), Dawson (1982), Gill (1976), Baccus <i>et al.</i> (1980)	Dawson (1982)
GLYCEROL-3-PHOSPHATE DEHYDROGENASE <sup>2</sup> (tissue)	$Gdc-1^a$ ( $Gpd-1$ ) $Gdc-1^b$		Gill (1976)	
GLUTAMATE OXALOACETATE TRANSAMINASE (soluble) (ASPARTATE AMINO TRANSFERASE)	$Got-1^a$ $Got-1^b$ $Got-1^c$		Gill (1976)	Dawson <i>et al.</i> (1983)
GLUCOSE-6-PHOSPHATE (AUTOSOMAL HEXOSE-6-P) DEHYDROGENASE <sup>2</sup> (soluble)	$Gpd-1^a$ ( $G6pd-1$ ) $Gpd-1^b$		Shaw and Barto (1965), Shaw (1966)	
HEMOGLOBIN - ALPHA TYPE GLOBINS (Duplicated locus)	$Hba^1 = (Hb^f) = (Hb^a)$ $Hba^2$ $Hbc^o = (Hb^o) = (Hb^l^o)$ $Hbc^1$ $Hbc^2 = (Hb^f)$		Thompson <i>et al.</i> (1966), Rasmussen <i>et al.</i> (1968), Jensen <i>et al.</i> (1976), Maybank and Dawson (1976), Snyder (1978, 1980b)	
HEMOGLOBIN - BETA TYPE GLOBINS (triplicated locus)	$Hbb^1$ $Hbd^o$ $Hbb-b1$ $Hbd^1$ or $Hbb-b2$ $Hbe^o$ $Hbb-b3$ $Hbe^1$	I	Snyder (1978, 1980b), Padgett <i>et al.</i> (1987)	Snyder (1980a)
HAPTOGLOBIN (serum) <sup>2</sup>	$Hp^1$ ( $Hpt$ ) $Hp^2$		Rasmussen (1968), Griswold and Dawson (1971)	
IMMUNOGLOBIN (7S <sub>γ</sub> )	$Ig^1$ $Ig^3$		Coe (1972)	
LEUCINE AMINOPEPTIDASE (serum)	$Lap-1^a$ $Lap-1^b$	V	Dawson (1982)	Dawson (1982), Dawson <i>et al.</i> (1983)
LACTATE DEHYDROGENASE <sup>2</sup> A SUBUNIT (tissue)	$Ldh-1^a$ ( $Ldh-A$ ) $Ldh-1^b$		Cattanach and Perz (1969)	
LACTATE DEHYDROGENASE <sup>2</sup> B SUBUNIT (tissue)	$Ldh-2^f$ ( $Ldh-B$ ) $Ldh-2^s$		Shaw and Barto (1963)	

(Continued)

I. d. Biochemical variants (Continued)

Name of locus	Allelic designation	Linkage group	Definitive description and formal analysis	Recombination reported
6-PHOSPHOGLUCONATE DEHYDROGENASE (tissue)	$Pgd-1^a$ $Pgd-1^b$		Gill (1976)	Dawson <i>et al.</i> (1983)
PHOSPHOGLUCOMUTASE-1 (tissue)	$Pgm-1^a$ $Pgm-1^b$		Gill (1976)	
PHOSPHOGLUCOMUTASE-4 (tissue)	$Pgm-4^a$ $Pgm-4^b$ $Pgm-4^c$		Gill (1976)	
SUPEROXIDE DISMUTASE	$Sod-1^l = (Ng)$ $Sod-1^p$ $Sod-1^m$		Birdsall <i>et al.</i> (1970)	
TRANSFERRIN (serum)	$Trf^a = (Trf^1)$ $Trf^p$ $Trf^c$ $Trf^o$ $Trf^m = (Trf^M)$	V	Rasmussen and Koehn (1966), Biggers and Dawson (1971), Griswold and Dawson (1971), Canham <i>et al.</i> (1970)	Dawson (1982), Dawson <i>et al.</i> (1983)

Probably extinct in laboratory stocks.

<sup>1</sup>Autosomal unless otherwise stated.

<sup>2</sup>Symbols changed to avoid confusion with those in laboratory mouse (*Mus*). Obsolete published symbols shown in parentheses.

II. Genetic Loci Formally Described in the *Peromyscus leucopus* Species Group

Name of locus	Symbol and alleles	Mode of inheritance <sup>1</sup>	Reference	Recombination reported
ALBINO	c	recessive	Castle (1912)	
CARBONIC ANHYDRASE	$Ca^f$ $Ca^s$	co-dominance	Wilmot and Underhill (1972)	
CATALASE	$Cs^a$ $Cs^b$	co-dominance	Jensen (1969)	
ESTERASE-3 (Esterase-1) <sup>2</sup> (erythrocytic)	$Es-3^o$ ( $Es-1^a$ ) $Es-3^b$	semi-dominant	Wilmot and Underhill (1973)	
ESTERASE-2 (serum)	$Es-2^o$ ( $Es-2^a$ ) $Es-2^b$	semi-dominant	Wilmot and Underhill (1973)	
HEMOGLOBIN	$Hb^A$ (in <i>P. gossypinus</i> ) $Hb^B$ (in <i>P. gossypinus</i> ) $Hb^C$ (in <i>P. gossypinus</i> ) $Hb^D$ (in <i>P. leucopus</i> )	co-dominance	Foreman (1966)	
MAJOR HISTOCOMAPTIBILITY COMPLEX	<i>Mhc</i> (Classes I, II; multiple haplotypes)		Crew <i>et al.</i> (1989, 1990)	

<sup>1</sup> All are autosomal.

<sup>2</sup> Name and symbol changed to correspond to *Mus*. Obsolete names and symbols in parentheses.

### III. Formally Described Genetic Loci in Miscellaneous *Peromyscus* Species

Species	Locus	Symbol and alleles	Mode of inheritance	Reference
<i>P. truei</i>	ESTERASE-1	<i>Es-1</i> <sup>100</sup> <i>Es-1</i> <sup>93</sup>	co-dominance	Zimmerman and Kilpatrick (1975)
<i>P. eremicus</i>	PECTORAL SPOT	<i>psp</i>	recessive	Huestis (1925) Clark (1938)
<i>P. californicus</i>	HAIRLESSNESS	<i>hm</i>	recessive (?)	Packchianian and Louis (1984)

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### RODENT COMMUNITY ASSOCIATED TO AGRICULTURAL ZONE AT BAJA CALIFORNIA SUR, MEXICO.

Since 1990, a study of a community of rodents in a crop fields from Santo Domingo Valley, Baja California Sur is being carried. A comparison between different cultivation areas such as corn and chuck-pea as well as unaffected native vegetation areas was made. Each year losses of rodents pests occur at different phases in the agricultural production. At Santo Domingo Valley these losses became 170 million pesos (54,000 dollars) in each agricultural cycle every year. Considering the economic importance of rodents pests in this area, we make this study to give future solutions to this problem.

The sampling was conducted during each two months at the same areas, independently of the phenological state of the field. Thirty six Sherman traps were used for capture rodents, and an hectare quadrant was delimited and traps placing every 20 m. Collected specimens were marked and released, in order to use the capture-recapture method.

Results showed that the more important species to invade crop fields are: *Peromyscus maniculatus*, *Mus musculus* and *Perognathus baileyi*, while *Peromyscus eva* is a occasional visitor. The more abundant species at the native vegetation areas were *P. arenarius* and *D. merriami*, but also *Dipodomys merriami*, *D. aguilis*, *Perognathus arenarius*, *P. baileyi*, *Peromyscus maniculatus*, *P. eva*, *Neotoma lepida* and *Ammospermophilus leucurus* can be found.

The mean density of rodents at cultivated areas was 150 ind/ha, while at the shrub areas was 70 ind/ha. This proportion was similar during the postharvest period. Whereas in the following season our results were 63 ind/ha and 124.2 ind/ha respectively.

Based in our previous results, we concluded that *P. maniculatus* is the more important rodent in the agricultural zones at Santo Domingo Valley, and its distributional abundance is dependent of the sowing and harvest seasons.

Hall (1981) has recorded three different species of *Peromyscus* from this area: *P. maniculatus*, *P. eremicus* and *P. eva*, however *P. eremicus* was not found in this work.

**Reference:** Hall, E. R. 1981. The Mammals of North America. John Wiley & Sons, New York. Vol. I, 2nd. edition.

\* \* \*

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During the last ten years, small mammal trapping has been carried out on the Orday/Swisher tract in Putnam County, Florida. Ms. Suzanne Brand completed her master's thesis, which concentrated on the habitat requirements of *Peromyscus gossypinus*, and Dr. Cheri Jones completed her Ph.D. Dissertation concerned with the ecology of *Podomys floridanus* in the sandhill portion of the community. As many of you may be aware, North Central Florida experienced a prolonged drought with a net rainfall deficit for ten years. As a result, lakes and prairies have been drying up, and vegetational succession in wet prairies and lake beds has been well underway since 1988. The baseline data established by S. Brand has allowed us to examine the effects of the prolonged drought on the distribution and abundance of *P. gossypinus* and *P. floridanus*, while the uplands study of C. Jones has allowed us to continue to examine their relative abundance as a function of the drought situation.

It should be of interest to students of *Peromyscus* that *P. floridanus* is adapted to relatively xeric habitats. Thus, the drought conditions, although negatively influencing overall standing crop biomass of *P. floridanus*, has not had the same impact as on *P. gossypinus*. Indeed, it would appear that the populations of *gossypinus* are now pioneering the new successional vegetational stages in what was once dry prairie converting now to an early sere towards a moist hardwood forest. In the mean time, *P. floridanus* has vastly increased its range down slope to occupy areas formerly containing only *P. gossypinus*.

The dynamics of this situation is of great interest to us, and underscores the utility of long-term studies carried out on permanent preserves.

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Jones, C. 1989. Microhabitat use by *Podomys floridanus* in the high pine lands of Putnam County, Florida. Ph.D. Dissertation, University of Florida, Gainesville, Florida.

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## EFFECTS OF CHRONIC PCB EXPOSURE-ON REPRODUCTION IN THE OLD FIELD MOUSE

As a part of our continuing evaluation of the effects of chronic, low level PCB (Aroclor 1254) exposure on reproduction in *P. polionotus* monogamously mated pairs are maintained on 5 ppm PCB for 12 months with matched controls. Offspring of the exposed animals are maintained on the 5 ppm PCB diet and at age six weeks are paired with offspring of other exposed pairs. The investigation will continue through two generations of exposed animals and a number of parameters of reproductive success are compared. Upon conclusion of the 12 month, exposure mice are sacrificed and indicators of PCB exposure evaluated, including body and organ weights, activity and isozyme patterns of hepatic enzymes, and whole body burdens of PCBs.

Five pairs (one control, four experimental) have been analyzed to date for whole body burden by the Institute of Wildlife and Environmental Toxicology at Clemson University. The mean level for the controls was 0.18 ppm (sd 0.01) and for the exposed 2.41 ppm (sd 1.30). Within the exposed animals PCB concentration ranged from 0.44 to 3.97 ppm, suggesting individual variation in bioaccumulation of PCBs. There was no significant difference between males and females. An inverse relationship was noted between the total concentration of PCB/pair and number of offspring produced by that pair, however, four pairs is too small a sample to define a trend.

To date no significant differences in the first generation were found between controls and PCB exposed with regard to number of neonates or pups weaned per litter. Birth weights were lower in the PCB neonates but the difference was not significant; however, weaning weights were significantly lower. In the second generation, there was no significant difference in the number of pups born but birth weights were significantly lower in the PCB exposed pups. The number of pups surviving to weaning and weaning and weaning weights were also significantly lower in the second generation PCB exposed animals. These findings suggest that the effects of dietary PCB exposure are cumulative.

\* \* \*

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A major assumption of behavioral ecology is that behavior is adaptive, thus behavior is under genetic control. Here we provide a possible example of pleiotropic effects of the agouti coat-color locus in the woodland deer mouse, *Peromyscus maniculatus gracilis*. Two preliminary studies suggest behavioral differences between agouti and "non-agouti" (black: Horner et al. 1980) color-morphs.

First, observation of 12 black and 12 agouti deer mice suggest significant differences in the overall activity of the two color-morphs. Generally the black animals have a depressed behavioral profile. In 16 hours of observation (8 of each morph) the agoutis spent more time (58%) outside of their nest while the black morph spent more time (84%) within their nests. Although the absolute amount of activity was depressed for the black morph, the relative proportions of time spent in various locomotory activities (climbing cage walls, balancing on food bowl, exploring cage floor, walking along nest jar) was similar in both forms.

A second study examined the duration and frequency of grooming bouts in ten-minute continuous observations of forty adult deer mice (ten females and ten males of each color morph). Grooming bouts of the black deer mice lasted approximately an order of magnitude longer than those of the wild-type (black: 41.1 sec, SE 6.9, N=20 vs agouti: 4.48 sec, SE 0.34, N=20). No sex differences were observed. The variance of grooming-bout durations was also much greater for the black deer mice (coefficient of variance: black 75.4%, agouti 34.2%). The larger variance in black deer mice may be due to the presence of short and long grooming bouts in black deer mice and but only short bouts in agoutis.

Agouti deer mice display a single type of grooming bout. Grooming begins with rapid strokes to the head, progresses posteriorly, and ends with the tip of the tail. Little attention is given to the feet or the trunk. Black deer mice also exhibit this rapid grooming series but in addition perform a longer grooming sequence with more extensive grooming behavior, especially of the trunk and feet. These intensive grooming bouts may be responsible for the wide variance in grooming-bout durations of the black deer mice.

Further characterization of the behavior and pelage of these morphs is underway.

\* \* \*

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I recently completed a study of variation at the 6-phosphogluconate dehydrogenase locus in the subspecific hybrid zone of *Peromyscus californicus*. Most of the animals from my research colony are now at the Stock Center. I will also be making a *P. californicus* genomic library and some probes specific for 6-PGD available to other researchers through the Stock Center's Molecular Bank.

\* \* \*

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Updating my last reports on the young *Peromyscus* family with the pups that became bald about the time they emerged from their nesting jar - They are not sterile! They are still a vicious battling - many times to the death - group. The tank is often blood-spattered. Occasionally I have to remove the body of the battle loser. One female seems to be cannibalistic when it comes to newborns. There could be something wrong with them, as I have noted that other females on occasion have eaten young, but then will raise a litter, or even part of a litter from which she has eaten one or two soon after birth.

There were a dozen or more offspring from this "hairless" group. As they reached the stage when they began to change to the brown pelage the battles and deaths followed shortly. I removed a couple injured young which have survived. One has no tail left, just a stubby scab which is almost healed. Then I removed five more young. Only the four adults remain in their tank. I tried putting the seven young together in another tank. The six with tails are fine so far but at least one was vicious to the one without its tail so I had to remove it to another tank by itself. For the moment peace seems to have come to their group.

Because at the time of my last report I still thought these mice might be sterile, I put the two females that mothered this group back with the male that fathered them, to see if they would produce anymore of the mutant pups.

Produce they did! After several litters, totaling ten pups I again removed the male. There were no hairless pups. All ten had normal coats, as did all the pups produced by the young who were hairless about the time that they were weaned.

However some of them have never been bred since, as I reported in the last issue, I had to separate them because of their vicious fighting. Some of them have remained alone. The four that are together - three females and a male are the parents of the seven remaining pups that I recently removed from their tank to prevent the pups' deaths. One of the females is heavy. She may be pregnant again, but I can't be sure since the mother of all of these mice is also heavy, and has been for the more than two years that I have had her in a tank where I can watch her. Both of these females have a white spot on their backs in almost the same position. The old one is docile and a fine mother, but this younger one is the vicious one that often kills the young.

Though this family has not produced any more of the mutant pups, the descendants of a litter of pups that I hand-raised (several years ago) on a formula after their mother died while still nursing them, has produced some pups that lost part of their hair at about weaning time. This group had produced some that were partially hairless at about the same time I had the hairless ones I wrote about last year.

This time the pups of one litter in the tank were hairless from the mid-section down over the hips (see photo). Another litter a few days younger in the same tank had patches of baldness on their backs, along with bald heads. Because these are a peaceful group and use a common nursery, with each female nursing the pups, I do not know which female gave birth to which litter. There is one very old female with a cataract on one eye that was mother to some of them, and one young female who was one of the litter of pups that lost their hair in the late summer of 1991 when they emerged from their nest jar. There are two other females, one old and one a littermate of the young one, but I do not think either of them is mother to any of the seven or eight pups that were born this summer. Anyhow they are a playfull group that are fun to watch. They are also interesting because of the surprises in coats that these mutants produce. Another difference is that their ears appear somewhat larger than most of my other mice. Is this a common characteristic of the mutant mice? Do any of you know?

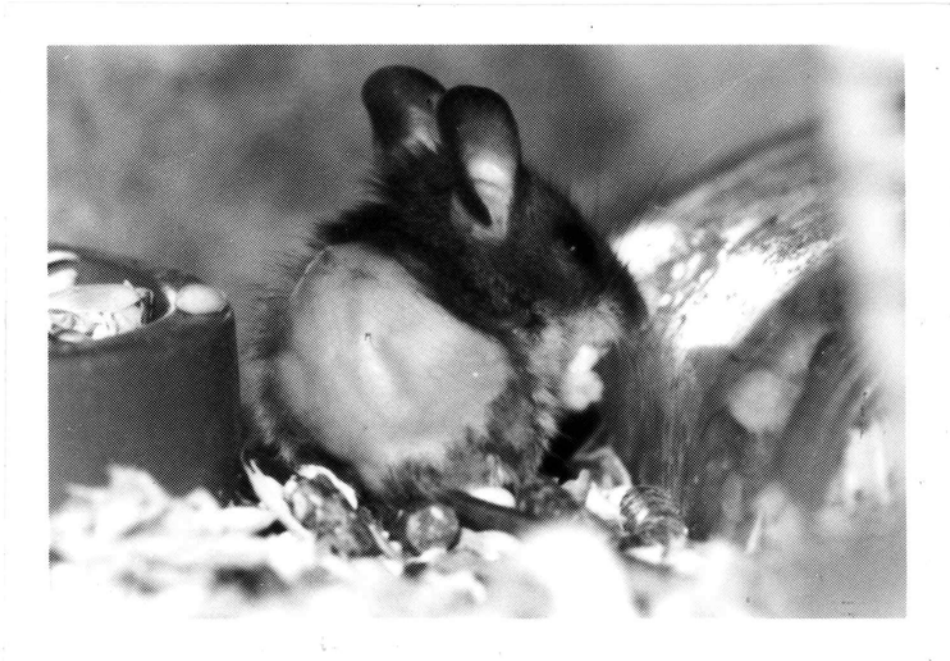
KLEIN (Continued)

Because of a back injury, I may have to give up my mice. Is there anyone who would like to have them to continue my behavioral study, with a few "hairless" mutants to add to the interest? I hope that some university might be willing to take them. How does one just stop after five years of study, and the attachment that one develops for many of the subjects?

Any suggestions would be appreciated.

I have started filming my mice with a camcorder. I hope to put together a film that will be interesting enough that it could be used in schools to show children what interesting animals *Peromyscus* are. I think this is a much better way to convey the message than by taking the animals to a schoolroom as one teacher requested. Nocturnal animals are rarely interesting for a daytime visit. They also tend to be very shy when strangers are in the vicinity.

Needless to say most of my filming is done at night when the mice are active - even entertaining!



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#### RELATIONSHIP BETWEEN COARSE WOODY DEBRIS AND THE DEMOGRAPHY OF DEER MICE IN MANAGED FORESTS OF WESTERN WASHINGTON

Although it is clear that habitat features influence population changes, often times it is unclear what exactly causes the changes. One habitat element that is generally thought to be an important resource, but that has received little quantitative attention is coarse woody debris (CWD). This habitat element can provide structural diversity, shelter, and food supplies for small mammal populations. Potentially, CWD can exist for extended periods of time and provide persistent structure even though other habitat features may vary dramatically. Because CWD is usually eliminated in successive timber harvests, the importance of this habitat element in the well-being of vertebrate communities has gained increased interest in the Pacific Northwest.

In June 1991, working in the Puget Sound Lowlands, Lee began a study of deer mice (*Peromyscus maniculatus austerus*) on sites supporting second-growth Douglas-fir forests which varied in the amounts of CWD present after timber harvest. Three control areas (typical amounts of CWD for unmanaged forests) and three treatment areas (very low amounts of CWD) were chosen and livetrapped biweekly from March through October and monthly from November through February. Data are being collected with Sherman traps on 10X10 grids (1 ha each) to compare differences in the *Peromyscus* populations inhabiting the two forest types with respect to density, survivorship, growth rates, persistence, and reproduction.

Preliminary results show that population density and numerical stability are greater on sites with CWD. Persistence (individuals present from one trapping period to the next) was significantly greater on sites with CWD than those without ( $P < 0.0001$ ). It also appears that animals on sites with CWD show higher survivorship, reproduction and growth rates. Study completion is scheduled for the summer of 1993.

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### Food Habits of the Perdido Key Beach Mouse, *Peromyscus polionotus trissyllepsis*

The Perdido Key beach mouse (*Peromyscus polionotus trissyllepsis*) is one of five subspecies of oldfield mouse that inhabit the dune habitats of the Alabama and Florida Gulf Coast. The Perdido Key beach mouse, Alabama beach mouse (*P. p. ammobated*), and Choctawhatchee beach mouse (*P. p. allophrys*) were listed as endangered on June 6, 1985 by the U. S. Department of the Interior under the Endangered Species Act of 1973. Two other subspecies, the St. Andrew beach mouse (*P. p. peninsularis*), and the Santa Rosa beach mouse (*P. p. leucocephalus*), are presently under review for listing by the U. S. Fish and Wildlife Service. Of the five subspecies, the Perdido Key beach mouse is the most in danger of extinction.

Perdido Key is a 23.7 km long island which parallels the Gulf Coast of Alabama and Florida. There are only two small populations of Perdido Key beach mice remaining on Perdido Key. Less than 150 individuals remain on 2.6 km of a section of Gulf State Park at the western tip of Perdido Key in Baldwin County, Alabama. The second remaining populations was reestablished to 11km of Johnson Beach, Gulf Islands National Seashore, Escambia County, Florida, by translocation of mice from the Alabama population. This population probably exceeds 100 as of spring 1992.

Very little is known of the natural history of the Perdido Key beach mouse. Food habits of beach mice are poorly understood and the small amount of information that does exist on foods for any of the beach mouse subspecies is strictly anecdotal. We have no definitive information on foods or their importance to beach mice throughout the year and in different seasons. To date, determination of beach mouse food habits by accepted scientific techniques has not been performed.

Observations by several researchers indicate that sea oats (*Uniola paniculata*) and bluestem (*Schizachyrium maritimum*) are probably primary food items for beach mice. Seed parts of sea oats, and maritime bluestem (*S. littorale*), have been identified in the stomachs of house mice (*Mus musculus*) from the North Carolina coast. House mice are suspected beach mouse competitors. Other items listed as possible beach mouse food items are beach grass (*Panicum amarum*), sea rocket (*Cakile constricta*), and beetles (*Coleoptera*). Ground cherries (*Physalis agustifolia*) and dead ghost crab (*Ocypode* sp.) have also been seen being eaten by beach mice. Foods consumed by inland subspecies of *P. polionotus* have been determined in general terms. Spring diets of Georgia oldfield mice were reported to be comprised of 50% seeds and 50% insects. Several plants and insect remains at the entrance to, and within, the burrows of Georgia oldfield mice have also been identified. Of the plants found at or within oldfield mouse burrows, several are also found in dune habitats along the Gulf Coast.

This study involves collection and analysis of beach mouse fecal pellets and stomach contents, seasonal population monitoring, and habitat analysis of study areas. Fecal materials and population data for Perdido Key beach mice will be collected at the two areas supporting the last known populations of these mice. Fecal materials of first-trapped mice captured each season will be gathered for food habits analysis. Stomach contents of Santa Rosa beach mice will be obtained by seasonal snap trapping at Fort Pickens, Gulf Islands National Seashore in Florida. Importance of items in the diet, and differences between years, seasons, sexes, and study areas will be determined. Habitat analysis will involve determining species diversity of the primary dune vegetation occurring at both Perdido Key study areas.

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