PEROMYSCUS NEWSLETTER

NUMBER TWENTY-THREE

MARCH 1997

Cover: *Peromyscus* rock art. Paperweight painted by Brenda Blackwelder, 1968. (Scale 1X)

Number 23

..... and counting.

First, an apology for the lateness of the "September" Issue, which was not mailed until the first week in January. Of course, we have excuses ... but we won't bore you with them. With this issue we expect to return to a reasonable mailing schedule. However, since we continued to add items to Issue #22 beyond the September deadline, we have fewer items for this one. So it will be a little slimmer.

We regret to announce that **Oscar Ward** has resigned as Co-editor of *PN*. Oscar retired from his academic postion at the University of Arizona in 1995, and is relinquishing his professional responsibilities. We want to thank Oscar for his tremendous help in getting the *Peromyscus Newsletter* up and running back in 1985 when we used a dot matrix printer and the office photocopy machine. Additionally, Oscar served as an *ex officio* member of the Stock Center Advisory Committee and rendered valuable service there also. You may find a few more misspellings and typos, but hope you will overlook them until we find a new Co-editor. Any volunteers???

We want to continue our "Peromyscus Pioneer" accounts from time to time. We know of several deserving individuals, both living and deceased, we hope to include in future issues of *PN*. To qualify as a "pioneer" an individual should no longer hold an active professional position. The individual should have made a noteworthy contribution to our knowledge of *Peromyscus*. A list of previous "Pioneers" is given below with the issue of *PN* in which they were profiled.

Wilfred H. Osgood (#1 March 1986)
Francis B. Sumner (#2 Sept. 1986)
Ralph R. Huestis (#3 March 1987)
Lee R. Dice (#4 Sept. 1987)
W. Frank Blair (#5 March 1988)
Emmet T. Hooper (#6 Sept. 1988)
Elizabeth Barto (#7 March 1989)
Tao-Chiuh Hsu (#8 Sept. 1989)
Paul A. Moody (#9 March 1990)
John A. King (#10 Sept. 1990)
Harold J. Egoscue (#11 March 1991)
Walter E. Howard (#12 Sep. 1991)
B. Elizabeth Horner (#13 March 1992)
John J. Christain (#15 March 1993)
Electrophoresis Pioneers I. (#18 Sept. 94)
Electrophoresis Pioneers II. (#20 Sept. 95)

If readers have suggestions of additional notable "Peromyscus Pioneers", please nominate your choice.

In this issue we have our second annual update of GenBank access numbers for *Peromyscus* nucleic acid sequences (page 10).

Send your entries for inclusion in *PEROMYSCUS NEWLETTER* # 24. We'll mail a reminder. The **deadline is Sept. 20.**

http://www.sc.edu/mouse/peromyscus.html

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WDD

PEROMYSCUS NEWSLETTER is produced by the

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C O N T E N T S

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NEWS, COMMENT and ANNOUNCEMENTS

The Stock Center acknowledges with thanks the gift of a "mint state" copy of King's *Biology of Peromyscus* from Dr. **Patricia DeCoursey**. The reference copy on hand since 1968 is becoming shopworn, so another copy is welcome.

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We regret to report the passing of **John J. Christian** on the 26th of January 1997. Dr. Christian was the subject of a "Peromyscus Pioneer" essay in the March 1993 issue (#15) of *PN*. Jack Christian was well known for his studies of endocrine regulation of reproductive cycles in wild rodents. He contrasted the relatively stable intrinsic controls in *Peromyscus* with exogenous regulation in voles.

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Several recent papers on *Peromyscus* are of particular interest:

* G.E. Demas and R.J. Nelson (1996) report photoperiod and temperature interaction effects on the immune system in *P. maniculatus*. *J. Biological Rhythms* 11:94ff.

* Jerry Wolff (1996), based on 14 years of data, concludes that coexistence of *P. maniculatus* and *P. leucopus* in the Appalachians may be maintained by differing physiological limitations in a fluctuating environment. *Oecologia* 108:ff.

* Robert Lacy and colleagues (1996) report that effects of inbreeding vary among subspecies of *P. polionotus* in a controlled study. A detailed discussion of causes in included in the paper. *Evolution* 50:2187ff.

* M. Kavaliers and co-workers (1996. *J. Comp. Physiol.* A 179:715ff) have an interesting article on the effects of magnetic fields on spatial learning in *P. maniculatus.*

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Query:

J. Alden Lackey is **SEEKING TISSUES** (heart, liver, kidney) of *Peromyscus maniculatus* from the eastern and from the western regions of the southern Appalachian Mountains for use in a systematic and biogeographic study (now largely completed) of this species in eastern North America. Sample size should be at least a dozen. Please contact: Dr. J. Alden Lackey, Department of Biology, SUNY, Oswego, NY 13126 (phone 315-341-4250; FAX 315-341-3059; e-mail lackey@Oswego.edu)

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The Peromyscus Genetic Stock Center is interested in obtaining any data that will aid in expanding the genetic map for the genus. This may be from in situ hybridization, somatic cell genetics, formal recombination analysis or other relevant means. Microsatellite or randomly amplified DNA marker data is welcome.

X-X-X-X-X-X-X-X

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BACK ISSUES. Unfortunately our supply of back issues of *PEROMYSCUS NEWSLETTER* is becoming depleted. The only issues we still have in adequate supply are Numbers 8, 13, 14, 17, 18, 19, 20 and 21. For others there are either no available copies or fewer than 5 on hand. Our last issue (#22 Sept 96) was undersupplied by the printer and we have no excess copies left. Photocopies of # 22 and other scarce back issues can be supplied for $ 5 each

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BAD NEWS. Increasing costs of animal husbandry coupled with diminished support from NSF for animal care will force an increase in the user fees charged by the Stock Center. We anticipate that the user fee per animal will increase beginning 1 July 97. User fees account for only 15% of the cost of supplying *Peromyscus*. The University of South Carolina subsidizes Stock Center operations in providing 20% of the cost, and NSF provides the balance. User fees are charged for in-house use of the Stock Center at the same rate as for external users. The University cannot reasonably be expected to subsidize users at out-of-state institutions from South Carolina state-appropriated funds.

-x-x-x-x-x-x-

We have a communication from **Alexander P. Kashtalian** *of the Berezinsky Biosphere Reserve, Republic of Belarus. He states that while there are no* Peromyscus *in Belarus, he has an interest in them for comparison with native voles (*Clethrionomys *and* Microtus*).*
Kashtalian is a subscriber to Peromyscus Newsletter.

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From time-to-time the Peromyscus Stock Center receives calls for information about obtaining bats, voles, shrews, opossums, etc. from laboratory sources. If any of our subscribers know of captive colonies of these and other non-domesticated small mammals, we would like to hear from you. Please call Janet Crossland or Wallace Dawson (803) 777-3107 or e-mail: peromyscus@stkctr.biol.sc.edu

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No, this issue's cover illustration is not a Rock Mouse (*Peromyscus difficilis*), but is a " mouse rock"!

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See our home page: http://www.sc.edu/mouse/peromyscus.html

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** *(BUT SEE PAGE 5)* 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

WILD TYPE SPECIES	ORIGIN
P. maniculatus bairdii (BW Stock)	Closed colony bred in captivity since 1948. Descended from 40 ancestors wild-caught near Ann Arbor MI
P. polionotus subgriseus (PO Stock)	Closed colony since 1952. Derived from 21 ancestors wild-caught in Ocala Nat'l. Forest FL. High inbreeding coefficient.
P. polionotus leucocephalus (LS Stock)	Derived from beachmice wild-caught on Santa Rosa I., FL. and bred by R. Lacy. Approximately ten generations in captivity.
P. leucopus (LL Stock)	Derived from 38 wild ancestors captured between 1982 and 85 near Linville NC. Approximately 20 generations in captivity.
P. californicus insignis (IS Stock)	Derived from about 60 ancestors collected between 1979 and 87 in Santa Monica Mts. CA. Approximately twelve generations in captivity.
P. aztecus (AM Stock)	Derived from animals collected on Sierra Chincua, Michoacan, Mexico in 1986 Approximately ten generations in captivity.
P. maniculatus X *P. polionotus* F_1 Hybrids	Sometimes available.

MUTATIONS AVAILABLE FROM THE STOCK CENTER[1]

Coat Colors	**ORIGINAL SOURCE**
Albino *c/c*	Sumner's albino deer mice (Sumner, 1922)
Ashy *ahy/ahy*	Wild-caught in Oregon ~ 1960 (Teed *et al.*, 1990)
Black (Non-agouti) *a/a*	Horner's black mutant (Horner *et al.*, 1980)
Blonde *bln/bln*	Mich. State U. colony (Pratt and Robbins, 1982)
[2]Brown *b/b*	Huestis stocks (Huestis and Barto, 1934)
California blonde *cfb/cfb*	Santa Cruz I., Calif., stock (Roth and Dawson, 1996)
Dominant spotting *S/+*	Wild caught in Illinois (Feldman, 1936)
Golden nugget b^{gn}/b^{gn} [in *P. leucopus*]	Wild caught in Mass. (Horner and Dawson, 1993)
Gray *g/g*	Natural polymorphism. From Dice stocks (Dice, 1933)
Ivory *i/i*	Wild caught in Oregon (Huestis, 1938)
[3]Pink-eyed dilution *p/p*	Sumner's "pallid" deer mice (Sumner, 1917)
Platinum *plt/plt*	Barto stock at U. Mich. (Dodson *et al.*, 1987)
[2]Silver *sil/sil*	Huestis stock (Huestis and Barto, 1934)
Tan streak *tns/tns*	Clemson U. stock from N.C. (Wang *et al.* 1993)
Variable white *Vw/+*	Michigan State U. colony (Cowling *et al.* 1994)
White-belly non-agouti a^{w}/a^{w}	Egoscue's "non-agouti" (Egoscue, 1971)
Wide-band agouti A^{Nb}/a	Natural polymorphism. U. Mich. (McIntosh, 1954)
Yellowish *yel/yel*	Sumner's original mutant (Sumner, 1917)

Other Mutations and Variants	**ORIGIN**
Alcohol dehydrogenase negative Adh^{o}/Adh^{o}	South Carolina BW stock (Felder, 1975)
Alcohol dehydrogenase positive Adh^{f}/Adh^{f}	South Carolina BW stock (Felder, 1975)
Boggler *bg/bg*	Blair's *P. m. blandus* stock (Barto, 1955)
Cataract-webbed *cwb/cwb*	From Huestis stocks (Anderson and Burns, 1979)
Epilepsy *ep/ep*	U. Michigan *artemisiae* stock (Dice, 1935)
[3]Flexed-tail *f/f*	Probably derived from Huestis flexed-tail (Huestis and Barto, 1936)
Hairless-1 *hr-1/hr-1*	Sumner's hairless mutant (Sumner 1924)
Hairless-2 *hr-2/hr-2*	Egoscue's hairless mutant (Egoscue, 1962)
Juvenile ataxia *ja/ja*	U. Michigan stock (Van Ooteghem, 1983)
Enzyme variants.	Wild type stocks given above provide a reservoir for several enzyme and other protein variants. (Dawson *et al.* (1983).

[1]Unless otherwise noted, mutations are in *P. maniculatus*.

[2]Available only as silver/brown double recessive.

[3]Available only as pink-eye dilution/flexed-tail double recessive.

OTHER RESOURCES OF THE *PEROMYSCUS* GENETIC STOCK CENTER:

Limited numbers of other stocks, species, mutants, inbreds and variants are on hand, or under development, but are not available for distribution. Currently we can supply up to 10 each of the species *P. eremicus* and *P. melanophrys*.

Preserved or frozen specimens of types given in tables above.

Tissues, whole blood or serum of types given in tables above.

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

Reference library of more than 2400 reprints of research articles and reports on *Peromyscus*. Copies of individual articles can be photcopied and mailed.

Materials are available through the *Peromyscus* Molecular Bank of the Stock Center. Allow two weeks for delivery. Included is purified DNA or frozen tissues from any of the stocks listed above. Several genomic and cDNA libraries and a variety of molecular probes are available. (See next page)

For additional information or details about any of these mutants, stocks or other materials contact: Janet Crossland, Colony Manager, Peromyscus Stock Center, (803) 777-3107 or peromyscus@stkctr.biol.sc.edu

PLEASE CALL WITH INQUIRIES.

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Materials on Deposit in the *Peromyscus* Molecular Bank

Accession Number	Item	Description	Species	Donor	Location[1]
Probes and Clones:					
Pr-01	LINE1	pDK62	*P. maniculatus*	D. Kass	C
Pr-02	LINE1	pDK55	*P. maniculatus*	D. Kass	C
Pr-03	ADH1	pADH F72	*P. maniculatus*	M. Felder	B
Pr-04[2]	Mys		*P. leucopus*	(Requested)	
Pr-05[2]	SAT		*P. leucopus*	(Requested)	
Pr-06	6PGD	pB5 clones	*P. californicus*	S. Hoffman	A
Pr-07	MHC *Pele*I	38dp2	*P. leucopus*	M. Crew	A
Pr-08	MHC *Pele*I	52ap6	*P. leucopus*	M. Crew	A
Pr-09	MHC *Pele*I	40Bgl	*P. leucopus*	M. Crew	A
Pr-10	MHC *Pele*I	53Pv1	*P. leucopus*	M. Crew	A
Pr-11	MHC *Pele*I	37B2	*P. leucopus*	M. Crew	A
Pr-12	MHC *Pele*I	37B4	*P. leucopus*	M. Crew	A
Pr-13	MHC *Pele*II	α3E23	*P. leucopus*	M. Crew	A
Pr-14	MHC *Pele*III	17E2	*P. leucopus*	M. Crew	A
Pr-15	MHC *Pema*I	pr44	*P. maniculatus*	M. Crew	A
Libraries:					
Lb-01	lambda genomic	liver (ADH+)	*P. maniculatus*	M. Felder	B
Lb-02	lambda cDNA	liver	*P. maniculatus*	M. Felder	B
Lb-03	lambda genomic	testis	*P. leucopus*	M. Crew	A
Lb-04	cosmid genomic	testis	*P. leucopus*	R. Baker	A
Lb-05	lambda genomic	liver	*P. californicus*	S. Hoffman	A
Frozen Tissue for DNA:					
S-01	bairdii (BW)	liver, tail, other[3]	*P. maniculatus*	Stk. Ctr.	A
S-02	subgriseus (PO)	liver, tail, other	*P. polionotus*	Stk. Ctr.	A
S-03	leucopus (LL)	liver, tail, other	*P. leucopus*	Stk. Ctr.	A
S-04	wild-caught SC	liver, other	*P. gossypinus*		A
S-05	aztecus (AM)	liver, tail, other	*P. aztecus*	J. Glendinning	A
S-06	insignis (IS)	liver, tail, other	*P. californicus*	S. Hoffman	A
S-07	inbred PmH1A	liver, other	*P. maniculatus*	Jackson Lab	A
S-08	inbred PmH8	liver, other	*P. maniculatus*	Jackson Lab	A

[1]Location code: **A** = USoCar SAI 01; **B** = USoCar CLS 603; **C** = USoCar CLS 707

[2]Not currently available.

[3]kidney, spleen, testis, carcass.

Peromyscus Nucleic Acid Sequences

Numerous nucleic acid sequences from *Peromyscus* are registered in GenBank. The sequences are annually indexed in the March issue of *PEROMYSCUS NEWSLETTER*. As a service, the *Peromyscus* Genetic Stock Center will furnish a printout of the full GenBank sequence, citations *etc.* Please request by GenBank accession number given in parentheses. Limit requests to no more than five at any given time. Include FAX number and it will be transmitted via FAX if less than 8 pages. A hard copy by mail will also be furnished, if requested. Call (803) 777-3107 or e-mail peromyscus@stkctr.biol.sc.edu

Sequences in this index are listed under major categories: (1) Nuclear genes (2) Nuclear elements and repeats, (3) Mitochondrial genes, and (4) other.

NUCLEAR GENES

Alcohol dehydrogenase *(Adh-1, 2)*

[PERADH1B] *P. maniculatus* alcohol dehydrogenase 1 (*Adh-1*) mRNA, complete cds. (**L15703**)

[PERADH2A] *P. maniculatus* alcohol dehydrogenase 2 (*Adh-2*) mRNA, complete cds. (**L15704**)

Hemoglobin beta chain *(Hbb)*

[PERHIBA] *P. maniculatus* (deer mouse) beta-1-globin (*Hbb-b1*) DNA, 5' region. (**M15292**)

[PERH1BB] *P. maniculatus* (deer mouse) beta-1-globin (*Hbb-b1*) DNA, 5' region. (**M15289**)

[PERH1BC] *P. maniculatus* (deer mouse) beta-1-globin (*Hbb-b1*) DNA, second coding-block region, partial cds. (**M15294**)

[PERH1BD] *P. maniculatus* (deer mouse) beta-1-globin (*Hbb-b1*) DNA, 3' region. (**M15297**)

[PERH2BA] *P. maniculatus* (deer mouse) beta-2-globin (*Hbb-b2*) DNA, 5' region. (**M15293**)

[PERH2BB] *P. maniculatus* (deer mouse) beta-2-globin (*Hbb-b2*) DNA, 5' region. (**M15290**)

[PERH2BC] *P. maniculatus* (deer mouse) beta-2-globin (*Hbb-b2*) DNA, second coding-block region, partial cds. (**M15295**)

[PERH2BD] *P. maniculatus* (deer mouse) beta-2-globin (*Hbb-b2*) DNA, 3' region. (**M15298**)

[PERH3BA] *P. maniculatus* (deer mouse) beta-3-globin (*Hbb-b3*) DNA, 5' region. (**M15291**)

[PERH3BB] *P. maniculatus* (deer mouse) beta-3-globin (*Hbb-b3*) DNA, second coding-block region, partial cds. (**M15296**)

[PERH3BC] *P. maniculatus* (deer mouse) beta-3-globin (*Hbb-b3*) DNA, 3' region. (**M15299**)

Major Histocompatibility Complex - CLASS I *(MHC I)*

[PELEMHC2] *P. leucopus* MHC class I *PeleM4* gene, exons 4 and 5 and partial cds. **(U21212)**

[PLU37435] *P. leucopus* MHC class I antigen *alpha3* domain gene, partial cds. **(U37435)**

[PELEMHC1] *P. leucopus* MHC class I *PeleM4* gene, exons 1, 2 and 3. **(U21213)**

[PERMHA11B] (*P. leucopus* group) Mouse MHC class I antigen (*Pele-A11b*) gene, exon 5. **(M59218)**

[PERMHA24A] (*P. leucopus* group) Mouse MHC class I antigen (*Pele-A24*) gene, exon 5. **(M59220)**

[PERMHA34C] (*P. leucopus* group) Mouse MHC class I antigen (*Pele-A34c*) gene, exon 5. **(M59221)**

[PERMHA37A] (*P. leucopus* group) Mouse MHC class I antigen (*Pele-A37*) gene, exon 5. **(M59222)**

[PERMHA38B] (*P. leucopus* group) Mouse MHC class I antigne (*Pele-A38B*) gene, exon 5. **(M59223)**

[PERMHA42B] (*P. leucopus* group) Mouse MHC class I antigen (*Pele-A42b*) gene, exon 5. **(M59224)**

[PERMHA42C] (*P. leucopus* group) Mouse MHC class I antigen (*Pele-A42c*) gene, exon 5. **(M59225)**

[PERMHA48C] (*P. leucopus* group) Mouse MHC class I antigen (*Pele-A48c*) gene, exon 5. **(M59226)**

[PERMHA6B] (*P. leucopus* group) Mouse MHC class I antigen (*Pele-A6b*) gene, exon 5. **(M59219)**

[PERMHP1LA4] *P. leucopus* MHC class I gene, exon 5. **(M60612, M33984)**

[PERMHP1LA5] *P. leucopus* MHC class I gene, exon 5. **(M60611, M33983)**

[PERMHP1LAA] *P. leucopus* MHC class I gene, exon 5. **(M60613, M33985)**

[PMPEMAT24A] *P. maniculatus* nonclassical class I antigen (*PemaT24*) mRNA, complete cds. **(U03104)**

[PMPEMA11A] *P. maniculatus* major histocompatibility complex class I antigen mRNA, clone *Pema11*, partial cds. **(U16846)**

[PMPEMA13A] *P. maniculatus* major histocompatibility complex class I antigen mRNA, complete cds. **(U12822)**

[PMPEMA41A] *P. maniculatus* clone *Pema41* major histocompatibility complex class I antigen mRNA, complete cds. **(U12885)**

[PMPEMA52A] *P. maniculatus* clone *Pema52* major histocompatibility complex class I antigen mRNA, complete cds. **(U12886)**

[PMPEMA53A] *P. maniculatus* major histocompatibility complex class I antigen mRNA, clone *Pema53*, complete cds. **(U16847)**

[PMPEMA62A] *P. maniculatus* clone *Pema62* major histocompatibility complex class I antigen mRNA, complete cds. **(U12887)**

Major Histocompatibility Complex - CLASS II *(MHC II)*

[PLU34805] *P. leucopus* MHC class II protein alpha-chain *PeleAa (MhcPeleAa)* gene, partial cds. **(U34805)**

Tumor Necrosis Factor *(Tnf)*

[PERPLTNFA] *P. leucopus* tumor necrosis factor (*P1TNF* gene) gene sequence, cds 5' end. **(M59233)**

snRNA *(BC1RNA)*

[PMU33851] *P. maniculatus* snRNA (*BC1 RNA*) gene, partial sequence. **(U33851)**

[PCU33850] *P. californicus* snRNA (*BC1 RNA*) gene, partial sequence. **(U33850)**

NUCLEAR ELEMENTS

LINE-1 *(L1)*

[PCU70828] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70828)**

[PCU70829] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70829)**

[PCU70830] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70830)**

[PCU70831] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70831)**

[PCU70832] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70832)**

[PCU70833] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70833)**

[PCU70834] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70834)**

[PCU70835] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70835)**

[PCU70836] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70836)**

[PCU70837] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70837)**

[PCU70838] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70838)**

[PCU70839] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70839)**

[PCU70840] *P. californicus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70840)**

[PLU70925] *P. leucopus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70925)**

[PLU70926] *P. leucopus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70926)**

[PLU70927] *P. leucopus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70927)**

[PLU70928] *P. leucopus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70928)**

[PLU70931] *P. leucopus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70931)**

[PLU70932; PLU43365] *P. leucopus* LINE-1 repetitive element reverse transcriptase gene, partial cds. **(U43365, U70932)**

[PERL1PM55X] (*P. maniculatus* group) Deer mouse (*L1Pm55*) gene. **(M97518)**

[PERL1PM62X] (*P. maniculatus* group) Deer mouse (*L1Pm62*) gene. **(M97517)**

[PMU43360] *P. maniculatus* LINE-1 repetitive element reverse transcriptase gene, partial cds. **(U43360)**

[PMU43362] *P. maniculatus* LINE-1 repetitive element reverse transcriptase pseudogene, partial cds. **(U43362)**

[PMU70924; PM1U43361] *P. maniculatus* LINE-1 repetitive element reverse transcriptase pseudogene, partial cds. **(U43361, U70924)**

[PMU70929] *P. maniculatus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70929)**

[PMU70930] *P. maniculatus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70930)**

LINE-1 (*L1*) Continued

[PMU70933] *P. maniculatus* LINE-1 repetive element reverse transcriptase pseudogene, partial cds. **(U70933)**

[PMU70934; PMU3363] *P. maniculatus* LINE-1 repetitive element reverse transcriptase pseudogene, partial cds. **(U43363, U70934)**

[PMU70935; PMU43364] *P. maniculatus* LINE-1 repetitive element reverse transcriptase gene, partial cds. **(U43364, U70935)**

MYS-1, MYS-2 *(Mys)*

[PLMYS1] *P. leucopus* retrovirus-like transposable element *mys-1*. **(X02855)**

[PERMYS21] Mouse (*P. leucopus*) retrovirus-like transposable element *mys-2*, left flank. **(M13343)**

[PERMYS22] Mouse (*P. leucopus*) retrovirus-like transposable element *mys-2*, right flank. **(M13344)**

ID Repeat *(ID)*

[PMU33854] *P. maniculatus* clone *Pma2* ID repeat element. **(U33854)**

[PMU33855] *P. maniculatus* clone *Pma3* ID repeat element. **(U33855)**

[PMU33856] *P. maniculatus* clone *Pmf0* ID repeat element. **(U33856)**

[PMU33857] *P. maniculatus* clone *Pmg1* ID repeat element. **(U33857)**

[PMU33858] *P. maniculatus* clone *Pmg2* ID repeat element. **(U33858)**

[PMU33859] *P. maniculatus* clone *Pmg3* ID repeat element. **(U33859)**

[PMU33860] *P. maniculatus* clone *Pmg4* ID repeat element. **(U33860)**

[PMU33861] *P. maniculatus* clone *Pmg5* ID repeat element. **(U33861)**

[PMU33862] *P. maniculatus* clone *Pmh1* ID repeat element. **(U33862)**

[PMU33863] *P. maniculatus* clone *Pmh3* ID repeat element. **(U33863)**

[PMU33865] *P. maniculatus* clone *Pmh5* ID repeat element. **(U33865)**

MITOCHONDRIAL GENES

Cytochrome B *(mtcytB)*

[MTPLCYTB] *P. leucopus* mitochondrial DNA for *cyt b* gene. **(X89790)**

[MTPGCYTB] (*P. leucopus* group) *P. gossypinus* mitochondrial DNA for *cyt b* gene. **(X89786)**

[MTPKCYTB] (*P. maniculatus* group) *P. keeni* mitochondrial DNA for *cyt b* gene. **(X89787)**

[MTPMCYTB] (*P. maniculatus* group) *P. melanotis* mitochondrial DNA for *cyt b* gene. **(X89791)**

[MTPPCYTBG] (*P. maniculatus* group) *P. polionotus* mitochondrial DNA for *cyt b* gene. **(X89792)**

[MTPECYTB] *P. eremicus* mitochondrial DNA for *cy b* gene. **(X89799)**

mtNADHDH **and** *tRNAs*

[PGU40246] *P. gossypinus* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40246**)

[PLU40252] *P. leucopus* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40252**)

[PMU40062] *P. maniculatus oreas* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40062**)

[PMU40063] *P. maniculatus interdictus* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40063**)

[PMU40249] *P. maniculatus austerus* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40249**)

[PMU40250] *P. maniculatus rufinus* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40250**)

[PMU40251] *P. maniculatus coolidgei* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40251**)

[PMU40247] *P. melanotis* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40247**)

[PPU40254] *P. polionotus* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40254**)

[PSU40253] *P. sejugis* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40253**)

[PSU40255] *P. sejugis* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40255**)

[PSU40248] *P. slevini* ND3 and ND4L genes, complete cds., tRNA(arg) gene, complete seq., tRNA(gly) gene, partial seq, and ND4 gene partial cds; mtDNA gene products. (**U40248**)

mtSSU **ribosomal RNA**

[MTPE12SR] *P. eremicus* mitochondrial DNA for *SSU* ribosomal RNA gene. (**X89784**)

[MTPL12SR] *P. leucopus* mitochondrial DNA for *12S* ribosomal RNA gene. (**X89797**)

[MTPG12SR] (*P. leucopus* group) *P. gossypinus* mitochondrial DNA for *SSU* ribosomal RNA gene. (**X89795**)

[MIPL12SRR] *P. leucopus* mitochondrial 12S rRNA gene. (**X99463**)

[MTPK12SR] (*P. maniculatus* group) *P. keeni* mitochondrial DNA for *SSU* ribosomal RNA gene. (**X89796**)

[MTPM12SR] (*P. maniculatus* group) *P. melanotis* mitochondrial DNA for *SSU* ribosomal RNA gene. (**X89785**)

[PP12SSSUR] (*P. maniculatus* group) *P. polionotus* DNA for *12S* ribosomal RNA gene. (**X89888**)

Other Peromyscine Species

MITOCHONDRIAL GENES

Osgoodomys [Peromyscus] banderanus:

[OBU62572;OBU18836] *O. [P.] banderanus* cytochrome c oxidase II gene, mitochondrial gene encoding mitochondrial protein, partial cds. **(U18836, U62572)**

[OBU67295] *O. banderanus* 12S ribosomal RNA gene, mitochondrial gene encoding mitochondrial rRNA, partial sequence. **(U67295)**

Onychomys sp.

[MTOA12SR] *O. arenicola* mitochondrial DNA for SSU ribosomal RNA gene. **(X89782)**
[OL12SSSUN] *O. leucogaster* DNA for 12S ribosomal RNA gene. **(X89889)**
[MTOT12SR] *O. torridus* mitochondrial DNA for SSU ribosomal RNA gene. **(X89783)**

[MTOACYTB] *O. arenicola* mitochondrial DNA for cyt B gene. **(X89793)**
[MTOLCYTB] *O. leucogaster* mitochondrial DNA for cyt B gene. **(X89794)**
[MTOTCYTB] *O. torridus* mitochondrial DNA for cyt B gene. **(X89798)**

[OAU21648] *O. arenicola* isolate LVT 614 cytochrome c oxidase subunit III gene, mitochondrial gene encoding mitochondrial product, partial cds. **(U21648)**
[OAU21649] *O. arenicola* isolate 615 cytochrome c oxidase subunit III gene, mitochondrial gene encoding mitochondrial product, partial cds. **(U21649)**
[OAU21650] *O. arenicola* isolate LVT 616 cytochrome c oxidase subunit III gene, mitochondrial gene encoding mitochondrial product, partial cds. **(U21650)**
[OLU21614] *O. leucogaster* isolate LVT 617 cytochrome c oxidase subunit 3 gene, mitochondrial gene encoding mitochondrial product, partial cds. **(U21614)**
[OLU21615] *O. leucogaster* isolate LVT 618 cytochrome c oxidase subunit 3 gene, mitochondrial gene encoding mitochondrial product, partial cds. **(U21615)**
[OLU21616] *O. leucogaster* isolate LVT 619 cytochrome c oxidase subunit 3 gene, mitochondrial gene encoding mitochondrial product, partial cds. **(U21616)**
[OTU21633] *O. torridus* isolate LVT 620 cytochrome c oxidase subunit III gene, mitochondrial gene encoding mitochondrial product, partial cds. **(U21633)**
[OTU21634] *O. torridus* isolate LVT 621 cytochrome c oxidase subunit III gene, mitochondrial gene encoding mitochondrial product, partial cds. **(U21634)**
[OTU21635] *O. torridus* isolate LVT 622 cytochrome c oxidase subunit III gene, mitochondrial gene encoding mitochondrial product, partial cds. **(U21635)**

VARIANT GENETIC LOCI IN NATURAL POPULATIONS OF PEROMYSCUS

Numerous electrophoretic studies of allozymes and other proteins in natural populations of *Peromyscus* have been conducted beginning in the late 1960's (See *PN* #18 and #20). These studies revealed numerous polymorphisms within populations and species, as well as variation among potentially interbreeding species, *e.g. P. maniculatus* and *P. polionotus*. Variants of a protein are generally presumed to identify a genetic "locus", although formal mendelian analysis might not have been accomplished.

PEROMYSCUS NEWSLETTER periodically lists in tabular form the known genetic loci in *Peromyscus* species or species groups. We distinguish between loci which have been formally **demonstrated** and **presumptive** loci. The latter are usually protein variants from natural populations identified by electrophoresis. Separate listings for the two categories are published in PN. Presumptive loci are not listed in the *Peromyscus* Gene Catalog.

In this issue Tables 1. and 2. summarize presumptive variant loci identified in the *P. leucopus* and *P. maniculatus* species groups, respectively. Similar tables in PN #16 and #21 list variant presumptive loci reported in other *Peromyscus* species and species groups. These tables are updated at three year intervals.

Since limited interbreeding in captivity is frequently possible among different species within a species group, we treat a species group as a single gene pool. Thus, while two species may each be monomorphic for alternate alleles, by hybridization heterozygotes might be produced and genetic analysis conducted. Linkage analysis and gene regulation potentially can be investigated using species hybrids. Such systems are currently used in both *Mus* and *Peromyscus*. Therefore, the tables serve as a reference to locate reported variants at given loci. **Completely monomorphic loci, *i.e.* loci for which no variation within the species or species group has been reported, are not listed.**

Only variants reported in refereed research publications, abstracts excluded, are listed in the tables. References are listed at the foot of each table. Please call our attention to omissions, corrections or newly published additions.

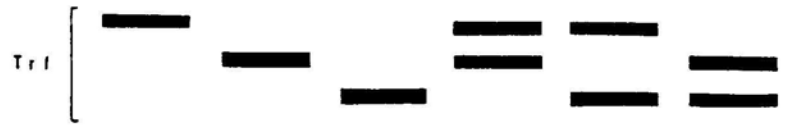

Table 1. VARIANT PROTEIN LOCI REPORTED FROM NATURAL POPULATIONS OF THE *PEROMYSCUS LEUCOPUS* SPECIES GROUP

Protein	Locus	Species	References
Acid phosphatase	*Acp-1*	*P. leucopus*	Nelson *et al.* (1987)
Aconitase	*Acon*	*P. leucopus*	Schnake-Greene *et. al.* (1990)
Adenosine deaminase	*Ada-1*	*P. leucopus*	Krohne and Baccus (1985)
Albumin	*Alb*	*P. leucopus* *P. gossypinus*	Brown and Welser (1968) Jensen and Rasmussen (1971) Browne (1977) Price and Kennedy (1984) Robbins *et al.* (1985)
Alcohol dehydrogenase	*Adh-1*	*P. leucopus*	Robbins *et al.* (1985) Nelson *et al.* (1987) Tolliver *et al.* (1987)
Adenylate kinase	*Ak-1*	*P. leucopus*	Nelson *et al.* (1987)
Amylase	*Amy-1*	*P. leucopus*	Aquadro and Patton (1980) Palas *et al.* (1992)
Carbonic anhydrase	*Ca-1*	*P. leucopus*	Wilmot and Underhill (1972) Krohne and Baccus (1985)
Creatine kinase-1	*Ck-1*	*P. leucopus*	Schnake-Greene *et al.* (1990)
NADH diaphorase	*Dia-1*	*P. leucopus*	Nelson *et al.* (1987)
Esterase	*Es-1* *Es-2* *Es-3* *Es-4* *Es-5* *Es-9*	*P. leucopus* *P. gossypinus*	Price and Kennedy (1980) Wilmot and Underhill (1973) Browne (1977) Smith *et al.* (1984) Robbins *et al.* (1985) Nelson *et al.* (1987) Tolliver *et al.* (1987) Schnake-Greene *et al.* (1990)

(Continued)

Table 1. Variant protein loci in *P. leucopus* group natural populations (Continued)

Protein	Locus	Species	References
Fumarate hydratase	*Fh-2*	*P. leucopus*	Nelson *et al.* (1987)
L-glutamate dehydrogenase	*Gld-1*	*P. leucopus*	Nelson *et al.* (1987)
Glutamate oxaloacetate transaminase	*Got-1* *Got-2*	*P. leucopus*	Price and Kennedy (1980) Nelson *et al.* (1987)
α-Glycerophosphate dehydrogenase	*Gpd-1* *Gpd-2*	*P. leucopus* *P. gossypinus*	Mascarello and Shaw (1973) Browne (1977) Robbins *et al.* (1985)
Glucose-6-phosphate dehydrogenase	*G6pd-1*	*P. leucopus*	Nelson *et al.* (1987)
Glucose phosphate isomerase	*Gpi-1* (*Pgi-1*)	*P. leucopus* *P. gossypinus*	Price and Kennedy (1980) Robbins *et al.* (1985) Nelson *et al.* (1987) Rogers and Engstrom (1992)
Hemoglobin	*Hb*	*P. leucopus* *P. gossypinus*	Foreman (1960) Foreman (1966) Price and Kennedy (1980)
Isocitrate dehydrogenase	*Icd-1* (*Idh-1*) *Icd-2*	*P. gossypinus*	Robbins *et al.* (1985) Nelson *et al.* (1987) Schnake-Green *et al.* (1990)
Lactate dehydrogenase	*Ldh-1*	*P. leucopus*	Robbins *et al.* (1980) Nelson *et al.* (1980)
Malate dehydrogenase-2	*Mdh-2*	*P. leucopus*	Schnake-Greene *et al.* (1990)
Malic enzyme	*Me-1*	*P. leucopus*	Nelson *et al.* (1987) Schnake-Greene *et al.* (1990)

(Continued)

Table 1. Variant protein loci in *P. leucopus* group natural populations (Continued)

Protein	Locus	Species	References
Mannose phosphoisomerase	*Mpi-1*	*P. leucopus*	Rogers and Engstrom (1992)
Major urinary protein	*Mup-1*	*P. leucopus* *P. gossypinus*	Cain *et al.* (1992)
Nucleoside phosphorylase	*Np-1*	*P. gossypinus*	Smith *et al.* (1984) Nelson *et al.* (1987) Schnake-Greene *et al.* (1990)
Peptidase	*Pep-2* (*Pep-B*)	*P. leucopus*	Nelson *et al.* (1987) Schnake-Greene *et al.* (1990)
Phosphogluconate dehydrogenase	*Pgd-1*	*P. leucopus*	Robbins *et al.* (1985) Nelson *et al.* (1987)
Phosphoglucose mutase	*Pgm-1* *Pgm-3*	*P. leucopus* *P. gossypinus*	Mascarello and Shaw (1973) Browne (1977) Price and Kennedy (1980) Robbins *et al.* (1985) Nelson *et al.* (1987)
Sorbitol dehydrogenase	*Sdh-1*	*P. leucopus*	Nelson *et al.* (1987)
Superoxide dismutase	*Sod-1* (*Ipo-1, Tetra-1*) *Sod-2*	*P. leucopus* *P. gossypinus*	Mascarello and Shaw (1973) Browne (1977) Price and Kennedy (1980) Robbins *et al.* (1985) Tolliver *et al.* (1987) Nelson *et al.* (1987)
Transferrin	*Trf*	*P. leucopus* *P. gossypinus*	Price and Kennedy (1980) Robbins *et al.* (1985) Krohne and Baccus (1985)

(Continued)

Table 1. Variant protein loci in *P. leucopus* group natural populations (Continued)

Protein	Locus	Species	References
Xanthine dehydrogenase	*Xdh-1*	*P. leucopus*	Nelson *et al.* (1987)
Non-specific proteins			
Plasma protein	*Pprt-1*	*P. leucopus*	Krohne and Baccus (1985)
General protein	*Gp*		Schnake-Greene *et al.* (1990)

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Table 2. VARIANT PROTEIN LOCI REPORTED FROM NATURAL POPULATIONS OF THE *PEROMYSCUS MANICULATUS* SPECIES GROUP

Protein	Locus	Species[1]	Reference
Acid phosphatase	*Acp-1*	*P. maniculatus*	Baccus and Wolff (1989)
Adenosine deaminase	*Ada-1*	*P. maniculatus*	Baccus and Wolff (1989)
Alcohol dehydrogenase	*Adh-1*	*P. maniculatus* *P. melanotis*	Avise *et al.* (1979) Baccus *et al.* (1980) Massey and Joule (1981) Calhoun *et al.* (1988) Baccus and Wolff (1989)
Albumin	*Alb*	*P. maniculatus* *P. polionotus*	Rasmussen (1970) Jensen and Rasmussen (1971) Selander *et al.* (1971) Avise *et al.* (1974) Biggers and Dawson (1971) Loudenslager (1978) Baccus *et al.* (1980) Calhoun *et al.* (1988)
Aldolase	*Aldo-1*	*P. maniculatus*	Baccus and Wolff (1989)
Amylase	*Amy-1*	*P. maniculatus*	Aquadro and Patton (1980) Palas *et al.* (1992)
Carbonic anhydrase	*Ca-1*	*P. maniculatus*	Baccus and Wolff (1989)
Catalase	*Cat-1*	*P. maniculatus*	Baccus and Wolff (1989)
Esterase	*Es-1* *Es-2* *Es-3* *Es-4* *Es-5* *Es-6* *Es-7* *Es-8*	*P. maniculatus* *P. polionotus*	Rasmussen and Jensen (1971) Selander *et al.* (1971) Peck and Biggers (1975) Gill (1976) Loudenslager (1978) Massey and Joule (1981) Foltz (1981) Aquadro and Kilpatrick (1981) Mewaldt and Jenkins (1986) Baccus and Wolff (1989)

(Continued)

Table 2. Variant protein loci from *P. maniculatus* group populations (Continued).

Protein	Locus	Species[1]	Reference
Glucose dehydrogenase	*Gdh-1*	*P. maniculatus*	Mewaldt and Jenkins (1986) Baccus and Wolff (1989)
Glutamate oxaloacetate transaminase (Aspartate aminotransferase)	*Got-1* *Got-2* (*Aat*)	*P. maniculatus* *P. polionotus* *P. melanotis*	Selander *et al.* (1971) Gill (1976) Loudenslager (1978) Avise *et al.* (1979) Baccus *et al.* (1980) Massey and Joule (1981) Aquadro and Kilpatrick (1981) Calhoun *et al.* (1988) Baccus and Wolff (1989) Medwaldt and Jenkins (1986)
Glucose-6-phosphate dehydrogenase	*G6pd-1* (*H6pd-1*)	*P. maniculatus*	Shaw and Barto (1965) Loudenslager (1978) Aquadro and Kilpatrick (1981)
α-Glycerophosphate dehydrogenase	*Gpd-1*	*P. maniculatus* *P. polionotus* *P. oreas*	Selander *et al.* (1971) Mascarello and Shaw (1973) Gill (1976) Avise *et al.* (1979) Calhoun *et al.* (1988) Baccus and Wolff (1989)
Glucose phosphate isomerase	*Gpi-1* (*Pgi-1*)	*P. polionotus* *P. melanotis* *P. maniculatus*	Selander *et al.* (1971) Avise *et al.* (1974) Avise *et al.* (1979) Massey and Joule (1981) Foltz (1981) Baccus and Wolff (1989)
Glutamate pyruvate transaminase	*Gpt-1*	*P. maniculatus*	Baccus and Wolff (1989)

(Continued)

Table 2. Variant protein loci from *P. maniculatus* group populations (Continued).

Protein	Locus	Species[1]	Reference
Hemoglobin	*Hba* *Hbb*	*P. maniculatus* *P. polionotus* *P. melanotis*	Thompson *et al.* (1966) Ahl (1968) Foreman (1968) Rasmussen *et al.* (1968) Rasmussen (1970) Selander *et al.* (1971) Snyder (1978, 1980) Loudenslager (1978) Avise *et al.* (1979) Massey and Joule (1981) Aquadro and Kilpatrick (1981) Chappell and Snyder (1984)
Haptoglobin	*Hpt*	*P. polionotus*	Peck and Biggers (1975)
Immunoglobin (7Sγ)	*IgG*	*P. maniculatus*	Coe (1972)
Isocitrate dehydrogenase	*Idh-1* *(Icd-1)*	*P. maniculatus* *P. oreas* *P. polionotus* *P. sejugis*	Mascarello and Shaw (1973) Baccus *et al.* (1980) Avise *et al.* (1974) Massey and Joule (1981) Aquadro and Kilpatrick (1981) Calhoun *et al.* (1988) Baccus and Wolff (1989)
Lactate dehydrogenase	*Ldh-1* *Ldh-2*	*P. maniculatus* *P. polionotus* *P. melanotis*	Selander *et al.* (1971) Avise *et al.* (1979) Massey and Joule (1981) Mewaldt and Jenkins (1986) Calhoun *et al.* (1988)
Malate dehydrogenase	*Mdh-1* *Mdh-2*	*P. maniculatus* *P. polionotus*	Selander *et al.* (1971) Massey and Joule (1981)
Malic enzyme	*Me-1*	*P. maniculatus*	Baccus and Wolff (1989)
Nucleoside phosphorylase	*Np-1*	*P. maniculatus*	Baccus and Wolff (1989)

(Continued)

Table 2. Variant protein loci from *P. maniculatus* group populations (Continued).

Protein	Locus	Species[1]	Reference
Peptidase	*Pep-1* (*Pep-B*) *Pep-2*	*P. maniculatus* *P. melanotis*	Avise *et al.* (1979) Baccus *et al.* (1980) Massey and Joule (1981) Calhoun *et al.* (1988) Baccus and Wolff (1989)
6-Phosphogluconate dehydrogenase	*Pgd-1*	*P. maniculatus* *P. polionotus* *P. oreas*	Selander *et al.* (1971) Mascarello and Shaw (1973) Gill (1976) Avise *et al.* (1979) Baccus *et al.* (1980) Massey and Joule (1981) Foltz (1981) Mewaldt and Jenkins (1986) Baccus and Wolff (1989)
Phosphoglucomutase	*Pgm-1* *Pgm-2* *Pgm-3* *Pgm-4*	*P. maniculatus* *P. polionotus* *P. melanotis*	Selander *et al.* (1971) Mascarello and Shaw (1973) Gill (1976) Avise *et al.* (1979) Massey and Joule (1981) Aquadro and Kilpatrick (1981) Baccus and Wolff (1989)
Sorbitol dehydrogenase	*Sdh-1*	*P. maniculatus*	Baccus *et al.* (1980) Massey and Joule (1981)
Superoxide dismutase	*Sod-1*	*P. maniculatus*	Baccus and Wolff (1989)
Transferrin	*Trf*	*P. maniculatus* *P. polionotus*	Rasmussen (1970) Biggers and Dawson (1971) Selander *et al.* (1971) Avise *et al.* (1974) Gill (1976) Redfield (1976) Loudenslager (1978) Avise *et al.* (1979) Baccus *et al.* (1980) Massey and Joule (1981) Foltz (1981)

(Continued)

Table 2. Variant protein loci from *P. maniculatus* group populations (Continued).

Protein	Locus	Species[1]	Reference
Urinary proteins		*P. maniculatus*	Cain *et al.* (1992)
Miscellaneous non-specific proteins (pre- and postalbumins *etc.*)		*P. maniculatus*	Mascarello and Shaw (1973) Gill (1976) Baccus and Wolff (1989)

[1]Species from which protein variants were obtained.

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BIOCHEMICAL SYSTEMATICS OF LONG-TAILED *PEROMYSCUS* IN EASTERN NORTH AMERICA

The geographic distribution of subspecies of long-tailed *Peromyscus maniculatus* in eastern North America was assessed on the basis of electrophoretic data and was found to be in accord with that mapped by Hall (1981) for the subspecies *abietorum*, *nubiterrae*, and *plumbeus*. The subspecies *gracilis* and *maniculatus*, however, are each composed of eastern and western genetic groupings according to several measures of genetic similarity; the eastern groups of *maniculatus* and *gracilis* are more closely associated genetically with each other than is either to the western group of its own subspecies, and vice versa. Samples of eastern *gracilis* and eastern *maniculatus*, therefore, collectively form a cohesive genetic grouping, as do western samples of these subspecies, implying a radically different distribution from that mapped in Hall (1981), and are at variance with the current taxonomy of these subspecies. Samples of *P. m. bairdii* (short-tailed subspecies) from New York to Manitoba revealed no indication of introgression with long-tailed samples. There is some evidence from specimens collected in Manitoba that these two forms do not intergrade there, thus bringing into question a long-standing assumption that they are conspecific in that region of the continent. Further field work in Manitoba will be undertaken to help clarify the situation. There is evidence of intergradation among the subspecies *plumbeus*, *gracilis*, and *maniculatus* in samples from eastern Quebec, and between *gracilis* and *abietorum* in a sample from northern New Hampshire. The sample of *gracilis* from the lower peninsula of Michigan is enigmatic in displaying close genetic relationships with various long-tailed and short-tailed samples, although length of tail in the Michigan sample is similar to that of long-tailed samples elsewhere. Two attempts to collect *P. maniculatus* in Labrador, the type locality of this species, were unsuccessful.

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PEROMYSCUS LEUCOPUS AND *P. MANICULATUS* IN STRUCTURALLY DIVERSE CLEARCUTS IN ADJACENT WOODLANDS IN WESTERN MARYLAND

Understanding the response of *Peromyscus* spp. to different successional stages following clearcutting will provide information important to prescribing forest management that will benefit these small mammals. The age of the clearcut profoundly affects which species may use the habitat because of changes in the vegetative structure of the forest. We had the unique opportunity to study the response of *Peromyscus* in a cluster of forest stands in western Maryland that have been logged annually since 1974. This cluster of clearcuts minimizes the between-site variation, such as elevation, slope, forest type, aspect, and local climatic conditions and this allows us to study more directly the responses of *Peromyscus* to changes in vegetation and abiotic features following clearcutting.

The objectives of this study were to 1) determine the abundance of *Peromyscus* in a chronosequence from recently cut to mature forests; 2) determine which *Peromyscus* are most affected by clearcutting and; 3) within seral stages determine habitat features that are associated with *Peromyscus.*

Peromyscus in nine clearcuts (three each of three different stages) and three mature areas were live-trapped for twelve days per month from September 1995 through August 1996, totaling 6,048 trapnights. These sites were divided into four structural classes based on measurements of vegetative structure and coarse woody debris. A total of 158 *P. leucopus* and 89 *P. maniculatus* were ear-tagged, weighed, sexed, and released at capture sites. We captured more *P. leucopus* (2.8 mice/100 trapnights) in clearcuts than in mature stands (1.9 mice/100 trapnights) and more *P. maniculatus* in mature stands (2.7 mice/100 trapnights) than in clearcuts (1.1 mice/100 trapnights).

Preliminary analyses indicated no difference in weights of *Peromyscus* among seasons or structural classes. Also, differences in age distributions of *P. maniculatus* across seasons and structural classes were nonsignificant. Differences in age distributions of *P. leucopus* were marginally nonsignificant ($p<0.10$) across seasons with more young captured in the spring, summer, and fall. The differences in age distributions of *P. leucopus* across structural classes were significant ($P<0.05$) with a greater abundance of young in mature stands than clearcuts. Differences in sex ratio of *P. leucopus* across seasons were also marginally nonsignificant ($P<0.01$) with a greater abundance of females than males in the winter. We are currently analyzing the data for relationships between the distributions of *Peromyscus* and habitat variables of the structural classes.

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PATTERNS OF CRANIAL ASYMMETRY IN THE *LEUCOPUS* GROUP OF *PEROMYSCUS* MICE

In a first study microgeographic variation of 11 bilateral, cranial characters of white-footed mice was examined from six sites in southwestern Tennessee. All characters examined show some level of asymmetry, with no significant differences between the sexes. The amount of fluctuating asymmetry (FA) was compared within and among sites. Interlocality comparisons showed that only the mandibular diastema length exhibited significant differences in the magnitude of fluctuating asymmetry. Within-locality variation showed significant differences in FA among all characters. A total asymmetry value (summation value) indicated that mice from bottomland habitat associated with the Mississippi River had the greatest amount of overall asymmetry. This result may indicate that these sites are of inferior habitat quality for this species.

A second study then assessed FA on a macrogeographic scale for mice from throughout the range of the species. All characters and all localities examined showed some degree of FA. Localities were projected onto principal components based on correlation of characters. The model revealed a pattern of morphologic variation in FA not associated with spatial proximity of localities or broad environmental variables determined for the localities. When viewed on a macrogeographic scale, the causes of FA appear to be confounding and multiple. However, the patterns of local variation may be more predictable than those derived based on larger geographic scales.

The third study looked at macrogeographic patterns of FA in *P. leucopus* in the southeastern United States and compared these to patterns exhibited by *P. gossypinus* from the same region. Principal components were extracted to summarize variation among localities (18 for each species). The model showed that similarities existed between the two species for characters that loaded highest on the first three components, but spatial trends for one species were not correlated with those of the other taxon.

These results represent a brief summarization of my dissertation which was completed in November 1996 at The University of Memphis. I would like to acknowledge Dr. Mike Kennedy for his considerable patience and long-term assistance in completing this research.

* * *

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EFFECTS OF MORPHINE ON ELECTRICALLY INDUCED CONTRACTIONS OF THE VAS DEFERENS IN *PEROMYSCUS CALIFORNICUS* AND *PEROMYSCUS MANICULATUS*

The response of the isolated vas deferens of *Peromyscus californicus insignis* to electrical stimulation is not inhibited by morphine. This suggests that the vas deferens of this species does not possess functional mu-receptors. Initial studies with *Peromyscus maniculatus bairdi* indicate that morphine may have some inhibitory effects in the vas deferens of this species.

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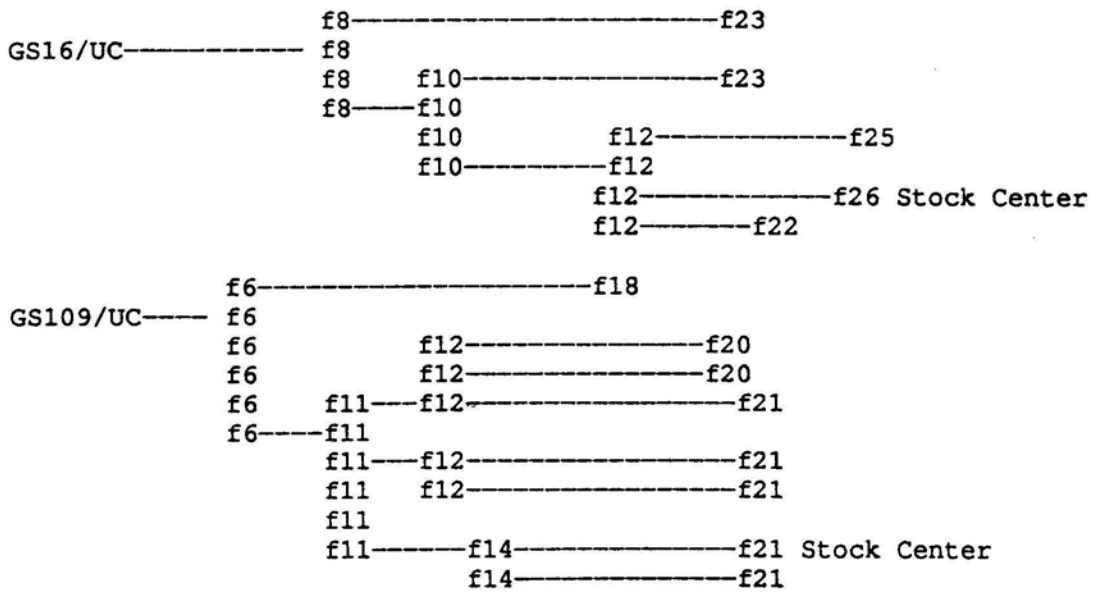
INBRED *PEROMYSCUS LEUCOPUS*-CURRENT STATUS 3/97

Breeders of the two inbred lines have been started at the Stock Center to establish a colony. There are several other sublines or "strains" of these two families as shown below with the generation at which they were separated and the present generation achieved. Please contact me to obtain animals for research (for cost of shipping). Breeders are available to anyone who wants to establish a colony of alternate strains. I must cut at least half the sublines in coming months.



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RECENT RECORDS OF THE COTTON MOUSE (*PEROMYSCUS GOSSYPINUS*) IN ILLINOIS

We document the first known occurrences of the cotton mouse (*Peromyscus gossypinus*) in Illinois since 1909. Historically, limited numbers of *P. gossypinus* were documented from five counties (Hoffmeister 1989). However, none have been found in Illinois since 1909. As noted by Hoffmeister (1989:215): "what has happened to *P. gossypinus* in southern Illinois remains a mystery. Ample search within the last 30 years has been made specifically for these mice. Trapping has been done in habitat that should be suitable for the species but no specimens of *P. gossypinus* have been found."

Identification of cotton mice can be problematic because of their morphological similarity to sympatric species of *Peromyscus* in Illinois, especially the white-footed mouse (*P. leucopus*). We based identification of the cotton mice on the mensural characteristics noted by Hoffmeister (1977). These included three skull measurements: condylobasal length, crown length of the maxillary toothrow, and length of the nasals, as well as hind foot length. We also used two discriminant function equations of Laerm and Boone (1994), one based on hind foot and skull length, the other on condylobasal length and maxillary toothrow length, to distinguish *P. gossypinus* from *P. leucopus*. We considered an individual a cotton mouse when there was consistent agreement using the criteria of both Hoffmeister (1977) and Laerm and Boone (1994).

Confirmed specimens were taken on Horseshoe Lake Conservation Area, Alexander County, and in Carbondale, Jackson County. The cotton mice occurred in forested bottomland habitat on both sites. Mean hind foot length and body mass of cotton mice from study areas in two counties were significantly greater than sympatric white-footed mice.

Despite extensive small mammal trapping, *P. gossypinus* have not been reported in southern Illinois since 1909. They may always have been in the region, either consistently or periodically, but simply were overlooked or misidentified. To test for misidentified specimens, we examined all *P. leucopus* in the Southern Illinois University at Carbondale Mammal Museum with hind foot >21 mm or body mass >23 g (n=8). Results were inconclusive. Hoffmeister's (1977) criteria are more conservative and referred all these specimens unquestionably to *P. leucopus*. However, four specimens were marginally *P. gossypinus* based on at least one of the equations of Laerm and Boone (1994). Conversely, *P. gossypinus* may have returned to the region relatively recently, perhaps in association with pronounced environmental changes such as the large-scale flooding in 1993 and 1994. Because the species is on the periphery of its range and commonly inhabits bottomland forest, *P. gossypinus* populations in southern Illinois may be ephemeral, being displaced periodically by flooding or other extrinsic factors.

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