Baiomys True, 1894

Baiomys True, 1894:758. Type species *Hesperomys* (*Vesperomys*) *taylori* Thomas.

CONTEXT AND CONTENT. Order Rodentia, Suborder Myomorpha, Family Muridae, Subfamily Sigmodontinae (Carleton and Musser, 1984). The genus contains two species. A key to the genus follows (adapted from Packard, 1960 and Hall, 1981):

1 Longitudinal, dorsal outline of the skull evenly convex; entoglossal process of the basihyal pointed and directed anteriorly; body of incus flattened, short process knob-shaped; orbicular apophysis of malleus round to oblong; baculum rounded at tip, 3.0 to 3.9 mm long .... *B. musculus*
1 Longitudinal, dorsal outline of the skull not evenly convex (outline anteriorly deflected ventrally from frontoparietal suture); entoglossal process of the basihyal rounded or absent; orbicular apophysis of malleus rounded to ovoid; baculum notched at the tip and less than 2.9 mm long ... . *B. taylori*

Baiomys taylori (Thomas, 1887)

Northern Pygmy Mouse

Hesperomys (*Vesperimus*) *taylori* Thomas, 1887:66. Type locality San Diego, Duval Co., Texas.
Peromyscus paulus J. A. Allen, 1903:598. Type locality Rio Sestin, northwestern Durango.
Peromyscus allex Osgood, 1904:76. Type locality Colima, Colima.
Baiomys taylori Mearns, 1907:381; first use of name combination.

CONTEXT AND CONTENT. Context noted in generic summary above. The following eight subspecies were recognized by Hall (1981):

B. t. allex Osgood, 1904:76, see above.
B. t. analogus Osgood, 1909:256. Type locality Zamora, Michoacan.
B. t. ater Blossom and Burt, 1942:2. Type locality 7 mi W Hereford, Cochise Co., Arizona.
B. t. canutus Packard, 1960:643. Type locality 1 mi S Pericos, Sinaloa.
B. t. fuliginatus Packard, 1960:645. Type locality 2 mi N, 10 mi E Ciudad del Maiz, 4,000 ft, San Luis Potosí.
B. t. paulus J. A. Allen, 1903:598, see above.
B. t. subater V. Bailey, 1905:102, Type locality Bernard Creek, near Columbia, Brazoria Co., Texas.
B. t. taylori Thomas, 1887:66, see above.

DIAGNOSIS. *Baiomys taylori* (Fig. 1) is the smaller of the two living species of pygmy mice and is the smallest North American rodent (Packard, 1960). Total length ranges from 87 to 123 mm. *B. taylori* is distinguished from *B. musculus* by a hind foot length of less than 16 mm, occipitonasal length less than 19 mm, and zygomatic breadth less than 10 mm. The rostrum of *B. taylori* (Fig. 2) is deflected ventrally at the frontoparietal suture rather than gradually curving toward the anteriormost point of the nasals (Packard, 1960). The dental formula is i 1/1, c 0/0, p 0/0, m 3/3, total 16. Molars of *B. taylori* are more hypsodont than those of *B. musculus* and the cingular ridges and secondary cusps of the teeth are reduced or absent (Packard, 1960; Packard and Montgomery, 1978). The entoglossal process of the basihyal is much reduced or absent (Packard, 1960; Hall, 1981). The baculum is narrow, has a notched tip, and usually is less than 2.9 mm in length (Blair, 1942; Hall, 1981). The short processes of the incus are attenuated (Packard, 1960; Hall, 1981).

GENERAL CHARACTERS. Average adult body mass of *B. taylori* is 6 to 9.5 g (Hudson, 1965). A weighted average (subspecies combined) of data provided in Packard (1960) yields means and ranges (in parentheses) for the following external measurements (in mm) for adults: total length, 106.3 (87 to 123); length of tail vertebrae, 42 (34 to 53); body length, 64.1 (53 to 76); length of hind foot, 13.5 (12 to 15); length of ear from notch, 10.8 (9 to 12). Sexual dimorphism has not been reported for measured characters (Packard, 1960). Individuals from populations in northern portions of the range or higher elevations have larger external measurements than counterparts in the south or at lower altitudes (Packard, 1960).

Similarly derived means and ranges (in parentheses) for cranial measurements (in mm) are: occipitonasal length, 18.1 (16.8 to 19.4); zygomatic breadth, 9.5 (8.7 to 10.2); postpalatal length, 6.6 (5.9 to 7.3); least interorbital breadth, 3.5 (3.3 to 3.9); length of incisive foramina, 4.0 (3.5 to 4.3); length of rostrum, 6.1 (5.2 to 6.8); breadth of braincase, 8.7 (8.0 to 9.1); depth of cranium, 6.6 (6.0 to 7.0); and alveolar length of maxillary tooth row, 3.2 (3.1 to 3.4).

Juveniles are uniformly gray above and lighter below (Packard, 1960). The dorsal pelage of adults varies from reddish brown, through gray to almost black above and white to creamy buff or gray below. The tail is covered with short hairs. Color of tail differs among subspecies and may be uniformly gray or bicolored (lighter ventrally).

DISTRIBUTION. The southern limit of the geographic range of *B. taylori* (Fig. 3) is in central Mexico (approximately 19°N) and extends north in three projections (Hall, 1981; Packard, 1960). The western projection extends along the west coast of Mexico to southern Sonora. A middle projection extends northwest through Durango and Chihuahua and reaches its northern limit in southeastern Arizona. The eastern projection extends from central Mexico, north to central Texas, and east along the Texas coast. Recent range expansions (Fig. 3) have occurred toward the Oklahoma border (Cokendolpher et al., 1979), and northwest and west onto the Texas High Plains (Diersing and Diersing, 1979; Stangl et al., 1983).

FOSSIL RECORD. Seven fossil species have been described for the genus (Gidley, 1922; Hibbard, 1953; Packard, 1960; Packard and Alvarez, 1965; Zakrzewski, 1969). According to Hibbard

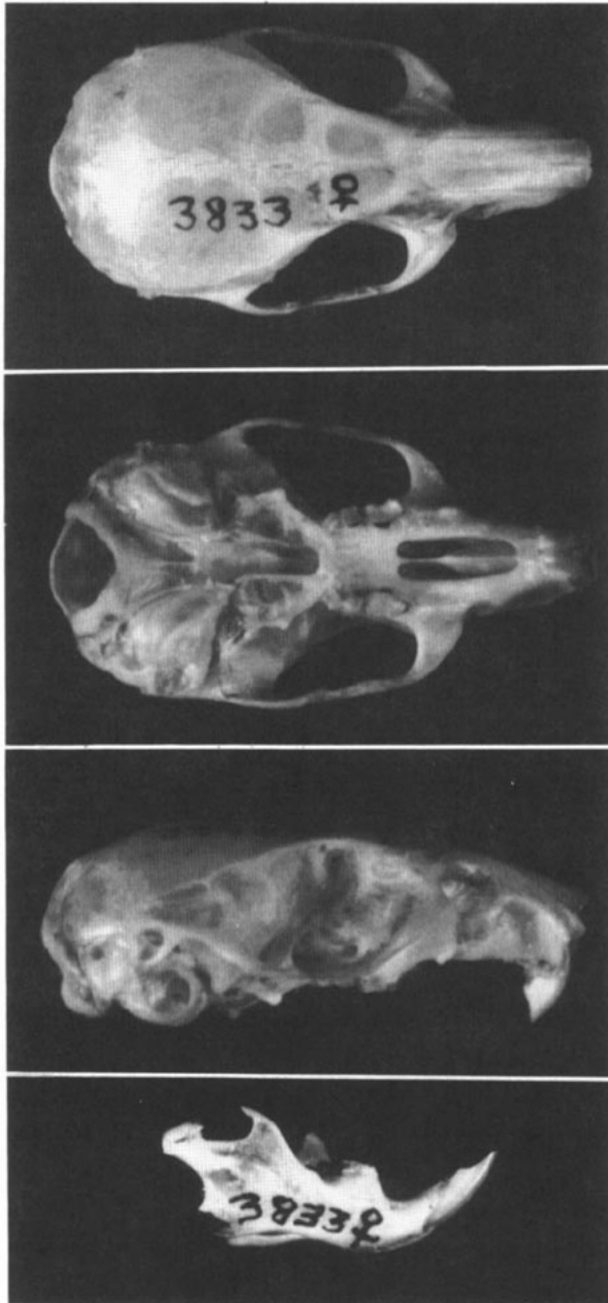FIG. 1. The northern pygmy mouse (*Baiomys taylori taylori*).

FIG. 2. Dorsal, ventral, and lateral views of the cranium and lateral view of mandible of *B. taylori*. (Skull from the Texas Cooperative Wildlife Collection, Texas A&M University.) Greatest length of skull is 18.8 mm.

FIG. 3. Geographic distribution of *B. taylori* (after Hall, 1981). Closed circles indicate range extensions described in text. 1, *B. t. allex*; 2, *B. t. analogus*; 3, *B. t. ater*; 4, *B. t. canutus*; 5, *B. t. fulignatus*; 6, *B. t. paulus*; 7, *B. t. subater*; 8, *B. t. taylori*.

(1953), the genus arose in the Blancan Land-Mammal Age of the late Pliocene. The oldest of the species seems to have been *B. sawrockensis* from Saw Rock Canyon, Seward Co., Kansas (early late Pliocene). Type specimens of *B. minimus* and *B. brachygnathus* are from the late Pliocene and midPleistocene, respectively, of Cochise Co., Arizona (Gazin, 1942; Hibbard, 1958). *B. minimus* also is represented in the Wolf Ranch fauna (Pliocene), San Pedro Valley, Arizona (Harrison, 1978). *B. rexroadi* and *B. kolbi* both were found in the Rexroad formation of the upper Pliocene in Meade Co., Kansas (Hibbard, 1953). *B. rexroadi* also was present in the Beck Ranch fauna of the Blancan Age (Dalquest, 1978). Packard and Alvarez (1965) described *B. intermedius* from late Pleistocene excavations near Tlalnepantla, state of Mexico, Mexico. Zakrzewski (1969) described *B. aquilonius* from the Hagerman local fauna (Pliocene) of Idaho. This fossil species represents the most northern occurrence of the genus. Jaw structure of *B. aquilonius* most closely resembles
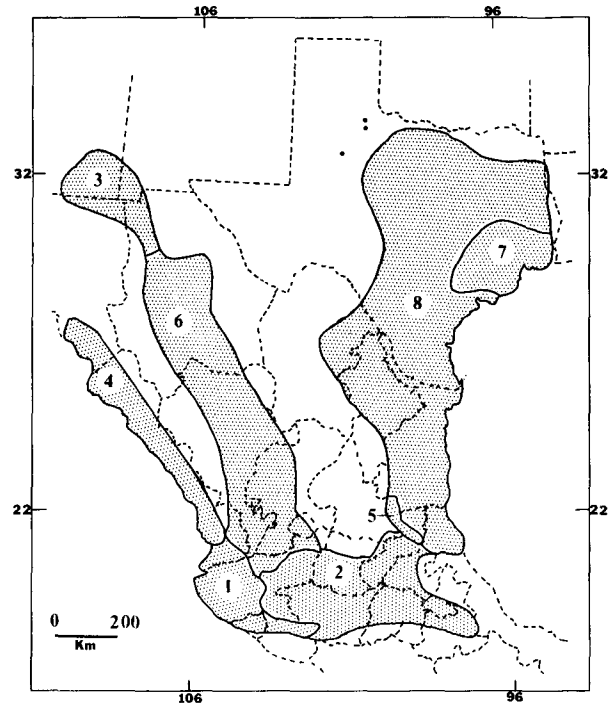
that of *B. rexroadi*. Packard (1960) and Packard and Alvarez (1965) concluded that *B. taylori* most likely was derived from a *B. sawrockensis-B. minimus-B. intermedius-B. musculus* line and split from *B. musculus* in the midPleistocene. These authors also proposed central Mexico as the center of speciation for the genus and considered *B. taylori* the more recent of the living species. Fossil remains of *B. taylori* were identified from the Pleistocene faunas of Schulze Cave, Edwards Co., Texas (Dalquest et al., 1969) and Cueva Quebrada, Val Verde Co., Texas (Lundelius, 1984).

FORM. Pelage color of *B. taylori* varies widely among the subspecies (Packard, 1960). The first evidence of postjuvenal molt is presence of bright brownish hairs on the head at 38 to 46 days of age (Blair, 1941; Packard, 1960). Sequence of the molt (Packard, 1960) is similar to that reported for *Peromyscus* (Collins, 1918, 1924; Hoffmeister, 1951). Postjuvenal molt is complete at 60 to 74 days (Blair, 1941; Packard, 1960). Duration of the molt is similar to that reported for *Reithrodontomys* (Layne, 1959). Adult pygmy mice molt during all months of the year; however, the annual molt usually starts at the beginning of the rainy season. This molt begins anteriorly and proceeds posteriorly over the back (Packard, 1960). The pelage of a melanistic individual contained longer and finer hairs than "normal" animals of the same sex and age (Packard, 1960).

The rostrum anterior to the frontonasal suture typically is deflected ventrally 3 to 5° (Packard, 1960). The shape of the basihyal is particularly useful in discriminating between *B. taylori* and *B. musculus*. The entoglossal process points anteriorly in *B. musculus* and is rounded or absent in *B. taylori*. Mean length of the basihyal is 2.18 mm and its shoulders are flattened. The hypohyals remain distinct throughout life. The body of the incus is round and the short process is attenuated; sides of the long limb are nearly parallel. The malleus possesses a round to nearly ovoid orbicular apophysis. The anterior process is pointed, the neck short and slightly recurved. Sides of the stapes are bowed and the muscular process is reduced or absent.

Wet weight of skeletal muscle mass is 24% of the total body mass (Hudecki and Privitera, 1975). Hudson (1965, 1967) found heart weights to be 43 to 49 mg. *B. taylori* possesses a unilocular-hemiglandular stomach considered the primitive condition, a condition found in most of the South American cricetines (Carleton, 1973). Zimney et al. (1969) reported the pygmy mouse kidney

contained 42% more glycogen and 33% more inorganic phosphate than laboratory mice. Blood calcium is 50% less than in laboratory mice (Zimney et al., 1969).

The length of the baculum averages 2.53 mm (Packard, 1960) and its greatest basal width is 0.5 mm (Blair, 1941). The shaft of the baculum of *B. taylori* is significantly shorter and thinner than that of *B. musculus* (Packard, 1960; Packard and Montgomery, 1978). In addition, the basal wings project dorsolaterally rather than anteriorly (Packard, 1960). The glans is simple, having only one bone and spongy vascularized layers that extend through most of its length (Hooper and Musser, 1964). Hooper (1959) described the glans as bell or urn shaped with a length and diameter of 3.7 and 1.9 mm, respectively. The glans is covered with small spines that point proximally.

The male accessory glands of the northern pygmy mouse are similar to those of peromyscines and South American cricetines; however, only one pair of ventral prostates (4 by 3 mm) are present in *B. taylori* (Arata, 1964; Voss and Linzey, 1981). The ampullary gland is smaller than the typical condition with the individual tubular elements unconnected and less than 1 mm long. The vesicular glands (8 by 2 mm) also are reduced, simple, and slightly recurved at the tip. Anterior prostates are about 4 mm long. A single pair of preputial glands measuring about 5 by 2 mm are present along the sides of the glans. *Baiomys*, *Ochrotomys*, and *Onychomys* are the only forms that retain preputial glands in conjunction with the simple phallic type (Arata, 1964).

FUNCTION. The general physiology of the pygmy mouse has been relatively well studied because of its small size, subtropical origin, and adaptability to laboratory environments. The small size of neonates makes these animals especially suitable for investigations of critical size and development of homeothermy.

Hudson (1965) found heart rates of *B. taylori* were 300 beats/min at 37°C and 756 beats/min at 13°C in resting animals. Resting heart rates produced a calculated stroke volume of 11.3 μl/beat and a cardiac output of 3.4 ml/min.

Respiratory rates for an inactive animal ranged from 100 to 264 breaths/min at ambient temperatures of 33 and 13°C, respectively. Average metabolic rate of an animal at ambient temperatures of 30 to 33°C is 1.95 ml of $O_2 g^{-1} h^{-1}$. By use of cold-stress techniques, Hudson (1965) determined maximum oxygen uptake of 10.4 ml $O_2 g^{-1} h^{-1}$ occurred at ambient temperatures less than 10°C. A value of 12.30 ml $O_2 g^{-1} h^{-1}$ at 23°C was recorded by Rosenmann and Morrison (1974) by use of a helium-oxygen technique. Seeherman et al. (1981) also produced significantly higher O_2 uptake values from *B. taylori* on an exercise treadmill.

The average body temperature of resting animals is 32 to 36°C and average thermal conductance is 0.40 to 0.48 ml $O_2 g^{-1} h^{-1} °C^{-1}$ (Hudson, 1965). The thermal neutral zone of these mice ranged from 29 to 36°C.

Baiomys taylori readily enters shallow torpor at ambient temperatures near 20°C. Body temperature during these bouts is 23 to 25°C (Hudecki and Privitera, 1972; Hudson, 1965). If body temperature dropped below 22°C, animals could not be aroused without a source of external heat. Entrance into torpor is controlled by ambient temperature. Average time elapsed before entering torpor was 16.8 and 9.8 h for animals maintained at 20 or 9.5 to 17°C, respectively (Hudson, 1965). Length of torpor was variable and influenced by amount of food and water available before entrance into torpor and by ambient temperature (Hudecki and Privitera, 1972, 1975; Hudson, 1965; Zimney et al., 1969). Hudson (1965) determined a maximum duration of 20 h of torpor for animals maintained at ambient temperatures of 20°C. He also noted that animals that entered torpor spontaneously at ambient temperatures of 20°C aroused when ambient temperature decreased. An increase in ambient temperature of 3 to 5°C did not elicit arousal. Decreasing ambient temperature for animals maintained at 17°C did not stimulate arousal. Heart rates of torpid animals at 20.5°C were 108 beats/min and beats were skipped frequently. An ambient temperature of 15.5°C yielded a heart rate of 78 beats/min during torpor. Lowest respiratory rate during torpor is 12 breaths/min.

A large interscapular mass of brown adipose tissue is present in northern pygmy mice; however, other brown and white fat deposits are absent (Hudecki and Privitera, 1972, 1975). These studies indicated that 6-h exposure to 15°C elicited changes in brown adipose tissue. Although the animals were still active, glycogen and lipid particles decreased and mitochondrial swelling occurred to yield a calculated 200% increase in mitochondrial volume of brown fat. A significant decrease in lipid content was noted during torpor. Triglycerides were considered the main source of energy for torpor.

During arousal from torpor, small to medium-sized lipid vacuoles reappeared in brown fat tissue (Hudecki and Privitera, 1972). Heart rates during arousal were as high as 800 beats/min, respiratory rates increased from 60 to 200 breaths/min, and metabolic rates increased 5 to 7 times above basal (Hudson, 1965). The period of most rapid warming, 0.34°C/min, was recorded at body temperatures of 26°C and was coincident with shivering. In general, arousal was slow for an animal of this size.

ONTOGENY AND REPRODUCTION. The northern pygmy mouse breeds year-round with reproductive peaks in the late fall and early spring (Asdell, 1964; Blair, 1941; Packard, 1960; Raun and Wilks, 1964). Blair (1941) reported an average of 27.6 days between litters for six breeding pairs in the laboratory. Delayed implantation has been reported for *B. taylori* (Quadagno et al., 1970) and is equal to approximately 2 days for each pup nursed with a concurrent pregnancy. The gestation period is 20 to 23 days (Blair, 1941; Hudson, 1974; Quadagno et al., 1970). Average birth weight is 1.1 to 1.2 g (Blair, 1941; Hudson, 1974; Morrison et al., 1977a) and litter size ranges from 1 to 5 with an average near 2.5 (Blair, 1941; Morrison et al., 1976; Packard, 1960; Quadagno et al., 1970; Raun and Wilks, 1964). Captive females weaned an average of 2.2 young per litter (Morrison et al., 1976).

Neonates are naked and pink at birth and become darkly pigmented within the first day. The eyes of the young are closed at birth and open at 12 to 15 days (Blair, 1941). The incisors are erupted at birth (Quadagno and Banks, 1970). Packard (1960) found skull sutures closed at approximately 50 days of age. Shortly after birth the young attach to the mammae of the mother and only become detached at night while the mother forages (Quadagno and Banks, 1970; Raun and Wilks, 1964).

Young are weaned at 17 to 24 days (Blair, 1941; Packard, 1960; Quadagno and Banks, 1970). Youngest age of a female at conception was reported as 28 (Hudson, 1974) and 44 days (Blair, 1941). Blair (1941) reported an average age of females at sexual maturity of 61.5 days. Quadagno et al. (1970) found that males attained sexual maturity between 70 and 80 days of age and females between 60 and 90 days.

Growth of *B. taylori* follows a sigmoidal pattern and is primarily within the first 35 days of age (Hudson, 1974). The first phase of growth (0 to 11 days) yields instantaneous growth rates of 7.29 to 7.50% of body mass/day. First increase in metabolic rate in response to cold is coincident with the ability to crawl (5 days) at which time approximately 1 mm of underfur is present (Chew and Spencer, 1967). The latter authors concluded that movement is necesary for an initial homeothermic response. Additionally, a minimum body size of 2.4 g must be attained, regardless of age, before complete thermoregulatory capability is reached. The second phase of growth occurs from 11 to 17 days of age and produces instantaneous growth rates of 3.3 to 4.0% body mass/day (Hudson, 1974). Adult mass is attained by 50 days of age (Blair, 1941) and little addition to body mass occurs after the age of 20 weeks (Morrison et al., 1977a). Initiation of the second phase of growth is coincident with the full development of homeothermy at body weights of 2 to 2.5 g. *B. taylori* does not increase metabolism at ambient temperatures of 20°C until 5 to 8 days old (Chew and Spencer, 1967). The capability to maintain adult body temperatures (36 to 37°C) at ambient temperatures of 30°C is reached at 10 to 15 days of age (Hudson, 1974).

Hudson (1974) found no relationship between litter size (range 1 to 5) and growth rate of young, but postpartum pregnancy seemed to delay development. Litter size is not correlated with age at which adult body temperature is reached.

The northern pygmy mouse is polyestrous (Blair, 1941). Duration of the average estrous cycle is approximately 7.5 days (Hudson, 1974; Quadagno et al., 1970). Average duration of stages of the cycle was reported as: proestrous, 12 h; estrus, 24 h; metestrus, 48 h; and diestrus, 96 h (Quadagno et al., 1970). Frequent examples of postpartum estrus have been recorded (Hudson, 1974).

ECOLOGY. During a 9-day study, Stickel and Stickel (1949) estimated summer densities at approximately 17 to 19.5/ha. Other estimates range from 2 to 84 mice/ha (Grant et al., 1985; Petersen, 1975; Raun and Wilks, 1964; Schmidly, 1983). Schmidly (1983) reported that populations in old fields were stable at 2/ha; unmowed highway rights-of-way contained higher but more variable densities

(1 to 15/ha). Densities were lowest during the summer months. During a 2.5-year study, densities were 12.3 to 37 mice/ha (Raun and Wilks, 1964). Grant et al. (1985) calculated densities of 6 to 84 mice/ha in old field-postoak savanna habitat in eastern Texas during a 6-year study. Grant et al. (1985) and Raun and Wilks (1964) found lowest densities during early summer months (May-June) and highest densities in early fall and winter. Sex ratio of the population studied by Raun and Wilks (1964) was 1:1 and adults composed 75% of the population. Forty-five percent of marked adults were present for at least 2 months; 10% for 5 months; and 5% remained after 7 months. Mean survival for this natural population was 5 months, including a period of time for development and poor trappability of young mice because of their small size. Longest known survival of a marked individual in the field was 59 weeks.

Morrison et al. (1977b) reported a median life span of 23 weeks and a maximum life span of 170 weeks for laboratory-reared animals. Neonatal mortality is reported as 4.8% at 1 week of age and 19.5% at 1 month of age for laboratory-reared animals (Morrison et al., 1977b). Morrison et al. (1977b) suggested a two-stage survival curve with a period of reduced mortality between 50 and 70 weeks of age.

Sherman live traps or snap traps were equally successful in capturing B. taylori (Powell, 1968) and pitfall traps were less effective for capturing these mice (Petersen, 1980).

Baiomys taylori occurs in a wide variety of habitats, including coastal prairie (Blair, 1941, 1950; Schmidly, 1983), midgrass prairie (Stickel and Stickel, 1949), mixed-desert shrub (Blair, 1950, 1952), prickly pear (Opuntia lindheimeri)-short grass communities (Raun and Wilks, 1964), postoak savanna (Grant et al., 1985), pine-oak forest (Dalquest, 1968; Schmidly, 1983), and oak-hickory associations (Blair, 1950; Hunsaker et al., 1959). The northern pygmy mouse has not been captured above 2,438 m and generally occurs in more xeric habitats than its congener, B. musculus (Hooper, 1952; Packard, 1960). Highest population densities typically are found in areas of dense ground cover, particularly in prickly pear (Opuntia lindheimeri)-short grass communities (Raun and Wilks, 1964). Microhabitat distribution of animals is correlated with the distribution of prickly pear. This cactus provided protection of grasses from grazing by cattle and served as a refuge for the pygmy mouse. In areas with a dense litter layer or thick grass mat, B. taylori built runways similar to but smaller than those built by Microtus (Blair, 1941; Packard, 1960; Raun and Wilks, 1964; Stickel and Stickel, 1949).

Dense ground cover is a necessary component of optimal habitat for northern pygmy mice and any disturbance that reduces ground cover can reduce population density. Stickel and Stickel (1949) captured few B. taylori in areas of 1-year-old burns or areas of intense cattle grazing. Burning was more detrimental than grazing because it more completely removed the mat of dense grass (Baker, 1940). Powell (1968) concluded that cover was an integral component of the habitat of B. taylori. Two years after disturbance of a previously uniform habitat by applications of five different brush-control treatments, population densities of northern pygmy mice were highest where treatments permitted growth of the most ground cover.

Because of the affinity for cover, highways act as barriers to dispersal of pygmy mice (Wilkins, 1982). Although B. taylori inhabited highway rights-of-way (Schmidly, 1983), less than 2% of a marked population crossed roads 9.5 to 12.5 m wide. No animals were recaptured from areas that required longer crossings (Wilkins, 1982).

Stems and fruits of the prickly pear are the primary source of food and water for the pygmy mouse in xeric habitats. Grass seeds, grass leaves, mesquite (Prosopis juliflora) beans, and granjero (Celtis pallida) berries also are eaten (Raun and Wilks, 1964). Captive mice readily kill and eat insects, terrestrial snails (Helicinia orbiculata; Johnson, 1959), and small snakes (Leptotyphlops dulcis and Tropidoclonion lineatum; Pitts, 1978) even when herbaceous foods are readily available. Raun and Wilks (1964) found many H. orbiculata shells opened by rodents in the field and presumed B. taylori to be partially responsible, although other rodents known to eat snails also were present.

Home range estimates of B. taylori range from 45 to 729 m². Areas of male (567 m²) and female (451 m²) home ranges (determined as the area an animal was trapped in plus one half the distance to the nearest trap) were not significantly different in south Texas (Raun and Wilks, 1964). Home ranges were smaller in areas

of less cover. Considerable overlap of home ranges within and between sexes suggested a low level of territoriality and supported laboratory studies leading to the conclusion that B. taylori was socially tolerant of other individuals (Blair, 1941; Packard, 1960).

The most significant interspecific interaction occurs with the hispid cotton rat, Sigmodon hispidus. Stickel and Stickel (1949) found habitat segregation between the cotton rat and B. taylori, whereas Raun and Wilks (1964) concluded that intense interspecific competition for space with S. hispidus led to a decrease in B. taylori numbers. As density of cotton rats increased, pygmy mice were captured more frequently in marginal habitats and cotton rats were captured in areas that previously supported B. taylori. Schmidly (1983) reported lowest seasonal densities of pygmy mice concomitant with highest densities of cotton rats. In contrast, Grant et al. (1985) found no evidence of interspecific competition among B. taylori, S. hispidus, Reithrodontomys fulvescens, and Peromyscus leucopus in postoak-savanna habitat of east-central Texas. Laboratory experiments demonstrated that Baiomys was significantly more aggressive when paired with R. fulvescens than when paired with S. hispidus in the absence of cover (Putera and Grant, 1985). Sigmodon killed Baiomys in three of 12 pairings when cover was absent. When cover was present, all species showed avoidance behavior and spent most of their time in areas of heavy cover.

Little evidence for competition between B. taylori and other sympatric small rodents is available. R. fulvescens and R. megalotis each have been caught in the same trap with pygmy mice. Little adverse effect was noted on either of the species involved in multiple captures (Petersen, 1975). However, Putera and Grant (1985) demonstrated that B. taylori was dominant to R. fulvescens in laboratory encounters. B. taylori are syntopic with Peromyscus leucopus, Oryzomys palustris, Mus musculus, Onychomys leucogaster, O. torridus, Cryptotis parva, and Neotoma micropus (Blair, 1950; Hoffmeister, 1956; Packard, 1960; Petersen, 1975; Raun and Wilks, 1964). Houses of woodrats often are used as shelter by pygmy mice (Raun and Wilks, 1964). B. taylori also was captured in areas of contact with B. musculus (Hooper, 1952; Packard, 1960). Where these mice are sympatric, B. taylori usually is smaller and inhabits highlands whereas B. musculus inhabits more mesic lowlands. Packard (1960) suggested the diurnal habit of B. musculus led to temporal separation, therefore, less direct competition between the species. B. taylori and B. musculus are morphologically more similar in areas of allopatry and least similar where sympatric, leading Packard (1960) to suggest that this situation was an instance of character displacement.

Snakes are the primary predators of B. taylori in south Texas (Raun and Wilks, 1964). Based on analyses of stomach contents, the northern pygmy mouse was the third most important prey species by volume for rattlesnakes (Crotalus atrox) and the most frequently eaten mammalian prey species of the cottonmouth (Agkistrodon piscivorus). These mice also were found in stomachs of coachwhips (Masticophis flagellum). Several authors have confirmed predation of B. taylori by barn owls (Tyto alba) and great-horned owls (Bubo virginianus; Hamilton and Neill, 1981; Raun, 1960; Twente and Baker, 1951). Because of its crepuscular nature, the northern pygmy mouse also could be at risk of predation from many other raptors. The primary mammalian predator probably is the coyote (Canis latrans), although raccoons (Procyon lotor), striped skunks (Mephitis mephitis), and shrews (Cryptotis parva) also may eat pygmy mice (Raun and Wilks, 1964).

Baiomys taylori is host to the flea species Jellisonia ironsi and Polygenis sp. (Petersen, 1978). Jameson and Whitaker (1975) described the mite Radfordia hamiltoni from northern pygmy mice. A Brucella-like bacteria was isolated from these mice; however, this bacteria was not confirmed as Brucella abortus (Boeer et al., 1980). These rodents can not serve as a host reservoir for Brucella abortus (Boeer et al., 1980).

BEHAVIOR. The activity of B. taylori is best classified as crepuscular because these mice often are the first to be caught in traps in the evening (Packard, 1960). Captive animals are most active in dim or diffuse light.

Receptive females typically display a lordotic posture (Estep and Dewsbury, 1976). Male mice mount the female from behind and secure a firm grasp on her shoulders with their forepaws. A single deep thrust was followed by a series of extravaginal, shallow thrusts. Male and female turned rear to rear during copulation. Ejaculation was achieved after one insertion and copulation ceased

after one ejaculation. Mean latency for intromission was highly variable and averaged 98 min. Mean duration of the lock was 33.5 s. Copulatory behavior was consistent with predictions based on baculum morphology and reduced accessory glands (Estep and Dewsbury, 1976).

In captivity, both male and female mice care for the young (Blair, 1941; Packard, 1960). Male parental care consists of grooming and returning young to the nest. Cross-fostering studies indicated that time spent with foster parents of a different species (*Mus musculus*) until weaning may affect adult behaviors and reactions to conspecifics. Crossfostered adult females spent significantly more time associated with animals of their foster species. However, males did not show a significant response. The aversion *B. taylori* show to open areas in laboratory studies (Quadagno and Banks, 1970; Wilson et al., 1976) decreases when they are fostered by *Mus* suggesting that aversion to open areas might have a learned component (Quadagno and Banks, 1970).

Although Davis (1974) suggested that pygmy mice construct burrow systems, field evidence is lacking (Raun and Wilks, 1964). However, the extremely hard clay soils in the study area of the latter authors might have precluded burrow construction. The nest of *B. taylori* is usually a ball formed of finely shredded grass, corn silk, or cactus fibers (Packard, 1960; Raun and Wilks, 1964; Thomas, 1888). The central cavity of the nest may contain fur and one or two exits. Several runways lead from the nest. Nests usually are found under fallen logs, prostrate cactus pads, or within thick clumps of grass. More than one nest may be maintained by the same individual.

Two audible vocalizations were described for the northern pygmy mouse (Blair, 1941; Packard, 1960). The most common vocalization is a high-pitched squeal similar to calls of grasshopper mice (*Onychomys leucogaster*) and fulvous harvest mice (*Reithrodontomys fulvescens*). While emitting this call, the head of the animal is thrown forward and upward. Blair (1941) also heard a scolding sound given by a female with young when approached by males.

The pygmy mouse is "an excellent swimmer" although the fur becomes soaked after about 1 min in water (Blair, 1941).

GENETICS. The karyotype of *B. taylori* consists of a 2n of 48 acrocentric chromosomes (Hsu and Benirschke, 1967; Yates et al., 1979). This karyotype differs vastly from that of *B. musculus*, which is composed of 10 pairs of biarmed and 13 pairs of acrocentric autosomes (Lee and Elder, 1977). The karyotype of *B. taylori* resembles closely that of *Peromyscus crinitus* and often is used as an outgroup comparison for the peromyscines (Patton et al., 1981; Robbins and Baker, 1980; Yates et al., 1979). C-band preparations of the chromosomes reveal only centromeric heterochromatin. Sex determination is of the XX/XY type. The X chromosome is large and subtelocentric and the Y is a small subtelocentric (Hsu and Benirschke, 1967; Lee and Elder, 1977).

Both melanism (Packard, 1960) and albinism (Stickel and Stickel, 1949) have been reported for the species. Fertile hybrid offspring have been obtained from laboratory crosses of *B. t. subater* and *B. t. ater* (Blair and Blossom, 1948). Hybridization of species within the genus has not been reported (Packard, 1960).

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