

*Ochotona collaris*. By Stephen O. MacDonald and Clyde Jones

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*Ochotona* Link, 1795

Pika

*Ochotona* Link, 1795:74. Type species *Lepus ogotona* Pallas.

**CONTEXT AND CONTENT.** Order Lagomorpha, Family Ochotonidae. The genus *Ochotona* contains approximately 18 species: 16 in Eurasia, 2 in North America (Honacki et al., 1982).

*Ochotona collaris* (Nelson, 1893)

Collared Pika

*Lagomys collaris* Nelson, 1893:117. Type locality near head of Tanana River, about 200 mi. S Fort Yukon, Alaska.

*Ochotona collaris* Trouessart, 1897:648, first use of the current name combination.

**CONTEXT AND CONTENT.** Context given in the generic summary above. *Ochotona collaris* is a monotypic form.

**DIAGNOSIS.** Underparts creamy white, without buffy wash; upper parts drab, with grayish or blackish wash; grayish patch on nape and shoulders forming an indistinct collar (Fig. 1). Winter pelage similar to *O. princeps*, but coloration of *O. collaris* in other seasons more grayish and less buffy, both above and below (Howell, 1924). Near adult-sized young clear gray in color, whereas adults at this season (late July) tinged with brown about the head and neck (Dixon, 1938). A good character to identify *O. collaris* is the creamy-buff fur patch on the side of the face over the facial gland; in *O. princeps* this patch is rusty brown (Banfield, 1961). Skull (Fig. 2) comparable to that of *O. princeps* but broader, tympanic bullae larger, nasals shorter, interpterygoid fossa broader and more spatulate (Hall, 1951; Howell, 1924). Weston (1981) found significant differences in tooth morphology among the skulls of *O. collaris* and *O. princeps*.

**GENERAL CHARACTERS.** Measurements (in mm) of 15 adults (10 males, 5 females) are: total length, 178 to 198; hind foot, 29 to 31; occipitonasal length, 42.0 to 44.2; zygomatic breadth, 20.7 to 22.2; breadth of braincase, 18.0 to 19.3; interorbital breadth, 5.1 to 6.2; width of palatal bridge, 2.3 to 3.2; length of nasals, 12.6 to 13.8 (Howell, 1924). Body mass (in g) of 16 individuals from Alaska (University of Alaska Museum) averaged 129 (117 to 145). Hind limbs only slightly larger than front limbs; five digits on each front foot, with the first weakly reduced; four digits on each hind foot; soles of feet covered with long hairs; digital pads generally exposed; claws curved. Tail inconspicuous. Skull flat, strongly constricted between the orbits; no supraorbital process; zygomatic arch slender, not vertically expanded. Dental formula  $i\ 2/1, c\ 0/0, p\ 2/3, m\ 2/3$ , total 26. Cutting edge of first upper incisor V-shaped in anterior view; third molar simple. Clavicle well developed. No pubic symphysis. No scrotum in male; position of testes not externally evident; anal and genital orifices enclosed by common sphincter and with a common opening on apex of hairy, mobile prominence supported by slender rod of tail vertebrae (Diersing, 1984). Other general characteristics of the family and order were summarized by Howell (1924), Hall (1951), and Diersing (1984). Drawings (Smith, 1978) and photographs (Broadbooks, 1965; Dixon, 1938) of this species are available.

**DISTRIBUTION.** This species occurs in the mountains of central and southern Alaska from the Yukon-Tanana uplands and the Chigmit Mountains, west of Cook Inlet, to the head of Lynn Canal near Skagway, and in Canada from the Richardson Mountains north of the Arctic circle in Yukon and the District of Mackenzie, south into northwestern British Columbia and west to near the Mackenzie River in Northwest Territories (Feist and McCourt, 1973; Hall, 1951, 1981; Hock and Cottini, 1966; Howell, 1924; Libby,

1958; Manville and Young, 1965; Rausch, 1962; Youngman, 1975). The geographic distribution of *O. collaris* is depicted in Fig. 3. Locations of recent sight records of pikas by several different observers in the Shubelik, Romanzof, and Philip Smith mountains of the Brooks Range, northeastern Alaska, also are shown in Fig. 3. Dufresne (1955) mentioned reports of pikas north of the Arctic Circle in parts of the Brooks Range. None of these records from northern Alaska have been substantiated by either specimens or photographs.

*Ochotona collaris* is separated from the only other species of pika in North America, *O. princeps*, by an 800-km gap extending through British Columbia and Alberta, Canada (Youngman, 1975).

**FOSSIL RECORD.** A mummified specimen of *O. collaris*, along with preserved dung pellets, were reported from Pleistocene (Wisconsinan) deposits in central Alaska (Guthrie, 1973). Also, fossil materials of this species are known from the Yukon Territory (Harrington, 1977, 1978). Related forms have been described from fossil deposits in Alaska (Guthrie and Matthews, 1971) and Yukon (Harrington, 1978; Kurtén and Anderson, 1980). Size variation exhibited by fossil pikas was studied by Guthrie and Matthews (1971) and Weston (1981), who found that during the Pleistocene pikas were morphologically variable perhaps in accordance with shifts in habitats during early and middle Pleistocene in Alaska and the Yukon. Guthrie (1973) suggested that *O. collaris* became a distinct species from *O. princeps* during the isolation of the Wisconsin glaciation.

**FORM AND FUNCTION.** Detailed anatomical studies have not been made of *O. collaris*. A deep body temperature of 39°C was recorded for *O. collaris* (Irving and Krog, 1954). These animals do not hibernate (Dixon, 1938; Hock and Cottini, 1966; Smith, 1978). *O. collaris* has only one annual molt, whereas *O. princeps* has two (Howell, 1924; Rausch, 1962). Pikas have excellent hearing and vision. They climb from rock to rock with ease (Broadbooks, 1965; Smith, 1978).

**ONTOGENY AND REPRODUCTION.** The peak of the breeding season apparently occurs in May and early June (Dixon, 1938). A female killed on 30 May contained three embryos (Rausch, 1962), one killed on 4 June had four embryos (Youngman, 1975), and one collected on 6 June also contained four embryos (Dixon, 1938). A pregnant animal taken on 13 June was lactating (Rausch, 1962). Youngman (1975) reported lactating females on 12 June and 16 July. Young animals were first observed on 19 June (Rausch,

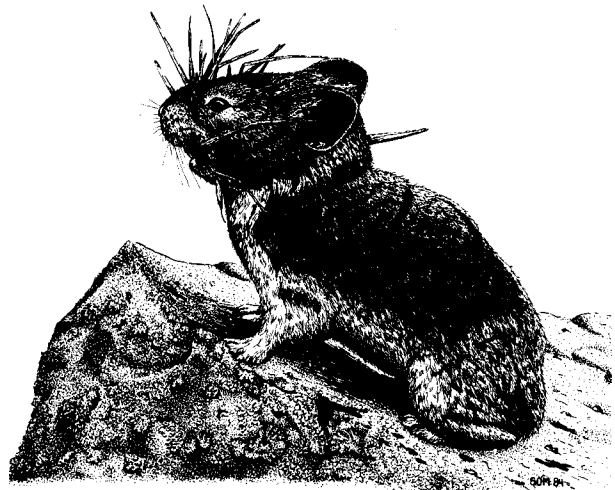


FIG. 1. Drawing of *Ochotona collaris*.

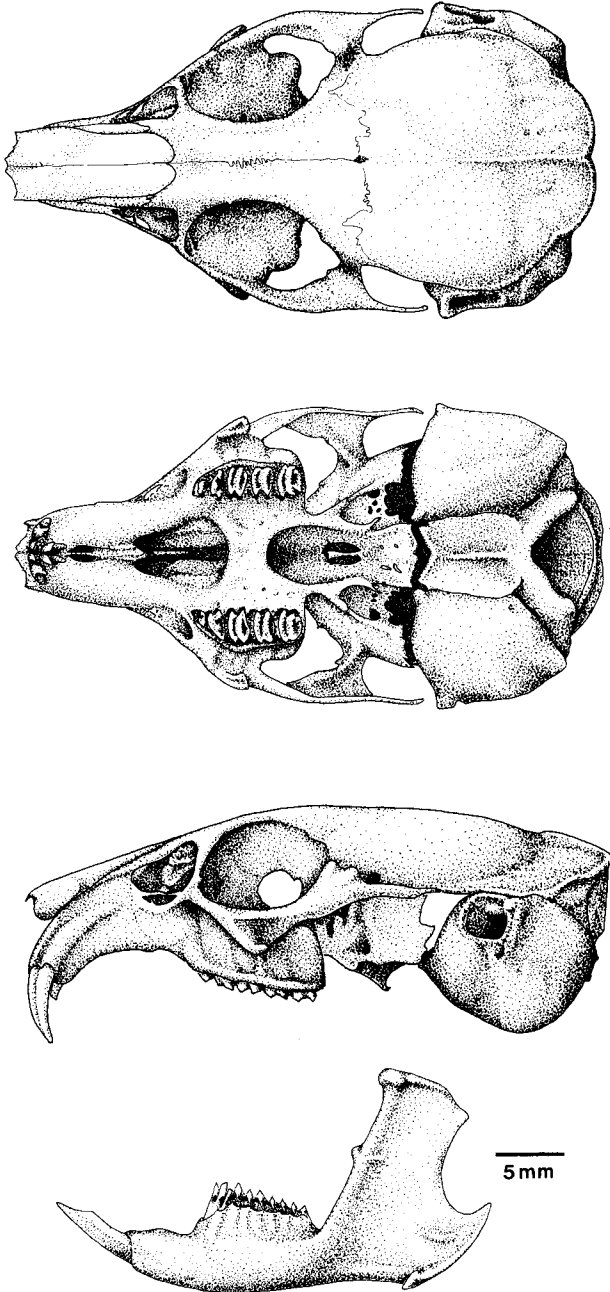


FIG. 2. Dorsal, ventral, and lateral view of cranium and lateral view of mandible of *Ochotona collaris* (UAM 2919 ♂) from Alaska.

1962). Young pikas are born blind and nearly hairless following a gestation period of about 30 days. Litters range in size from two to six young. Young pikas reach adult size in 40 to 50 days. Females can breed and produce young at about one year of age (Smith, 1978). Two litters may be produced per year (Rausch, 1962; Smith, 1978).

**ECOLOGY.** Pikas form colonies in mountainous terrain. They live mostly in rock slides, talus slopes, and among large boulders, usually near meadows and patches of vegetation. *O. collaris* is most numerous near the borders of talus slopes and rock slides (Broadbooks, 1965). Most records of *O. collaris* from Alaska and the Yukon are from above timberline (Broadbooks, 1965; Rausch, 1962; Youngman, 1975). However, sometimes these mammals are found in forested valleys and near sea level (Broadbooks, 1965; Rausch, 1962). Youngman (1975) reported a collared pika living in a burrow near the shoreline of Kluane Lake, Yukon.

The diet of *O. collaris* has not been described in detail. Piles

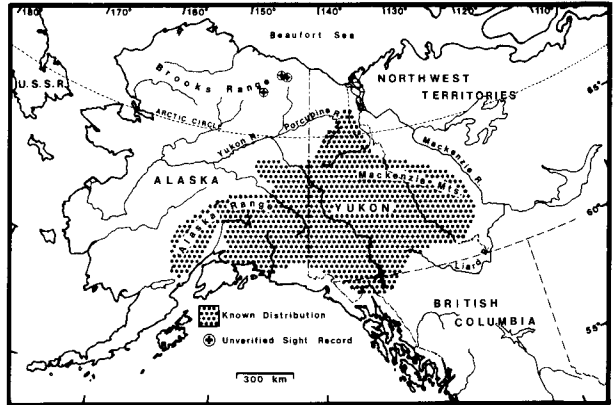


FIG. 3. Distribution of *Ochotona collaris*.

of hay made by pikas in Alaska included various parts of *Cystopteris fragilis*, *Lycopodium* sp., *Carex* sp., *Sanguisorba sitchensis*, *Cassiope stelleriana*, *Luetkea pectinata*, *Epilobium latifolium*, *Ledum palustre*, *Vaccinium vitis-idaea*, *Empetrum nigrum*, *Salix* sp., and *Betula kенаica* (Rausch, 1962). Osgood (1909) found that pikas used most of the common plants in an area, but used *Dryas* sp. most extensively. Dried fecal pellets of hoary marmots (*Marmota caligata*) frequently were found in haystacks made by pikas; Broadbooks (1965) saw pikas consume these droppings. Dried feces of the ermine (*Mustela erminea*) were noted on haypiles (Rausch, 1962).

The collared pika has a home range of about 30 m in diameter (700 m<sup>2</sup>). This size is comparable to the home ranges calculated for *O. princeps* and *O. hyperborea* (Broadbooks, 1965). Average distances between haypiles and dens of collared pikas in Denali National Park ranged from 30 to 70 m. Haypiles and dens of pikas were not evenly spaced; spacing was influenced probably by the availability of suitable shelters for haypiles and dens, and distances to patches of vegetation (Broadbooks, 1965). Population densities of collared pikas were estimated to range from 6.4 to 7.2 animals/ha (Broadbooks, 1965).

Other small mammals that share rock slides and talus slopes with collared pikas include hoary marmots, Arctic ground squirrels (*Spermophilus parryii*), northern red-backed voles (*Clethrionomys rutilus*), and ermines. Arctic ground squirrels seemingly eat many of the same species of plants as *O. collaris*, but Broadbooks (1965) noticed no antagonistic encounters between these two species.

Ermines apparently eat more pikas than any other predator (Banfield, 1974; Broadbooks, 1965; Rausch, 1962). Also, martens (*Martes americana*) and red foxes (*Vulpes vulpes*) may hunt pikas occasionally; other predators include large birds of prey (Accipitridae, Strigidae; Broadbooks, 1965; Smith, 1978).

Pikas have numerous parasites. Holland (1958) found three species of fleas (Siphonaptera) on collared pikas: *Monopsyllus tolli*, *Ctenophyllus armatus*, and *Amphalius runatus*. Mites (Acarina) and botflies (Oestridae) also infest pikas (Smith, 1978). Among the parasitic helminths, the cestode, *Schizorchis caballeri*, was found to infect 17 of 52 pikas from southern Alaska (Rausch, 1960). *Labiostrongylus rauschi*, *Eugenuis talkeetnaeauris*, *Cephaluris collaris*, and *C. alaskensis* are nematodes described from pikas from this same area (Akhtar, 1956, 1958). Protozoan parasites occurring in collared pikas are *Eimeria circumborealis*, *E. klondikensis*, *E. banffensis*, *E. calentinei*, *E. barretti*, *E. princepsis*, *Isospora marquardtii*, *I. yukonensis* (Hobbs and Samuel, 1974), and *Sarcocystis* sp. (Rausch, 1962).

**BEHAVIOR.** Collared pikas are diurnal with most activity taking place in the morning and late afternoon. These animals sometimes rest and sun themselves on rocks, but most of the day is spent feeding and gathering vegetation for their caches of winter food. The gathering of hay begins usually in late June and early July; once begun, haymaking becomes a constantly increasing activity. Each pika may make several haystacks within its home range; frequently, an animal concentrates on one haypile with small caches of food elsewhere in the vicinity (Broadbooks, 1965; Smith, 1978). Haystacks are put in the same places year after year, usually under overhanging rocks, in crevices, and along the edges of boulders.

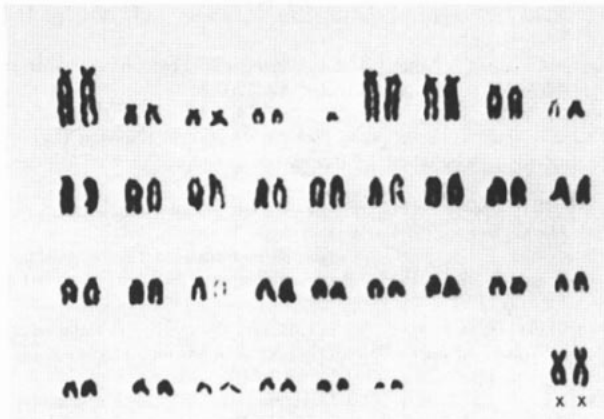


FIG. 4. Standard karyotype of a female *Ochotona collaris* from Eagle Summit, Alaska (65°29'N, 145°25'W; Yukon-Tanana Uplands).

Broadbooks (1965) found great variability in the sizes of the piles of hay; dimensions of food caches were concordant with the sizes of the available shelters.

*Ochotona collaris*, like most Ochotonid species, are vocal animals. Both sexes emit calls, usually from more or less fixed points within the home ranges. When calling, pikas sit with their bodies hunched and noses pointed slightly upward. Sometimes animals produce vocalizations from within burrows, beneath rocks, or even while running (Broadbooks, 1965; Kawamichi, 1981). Collared pikas vocalize frequently during hay gathering activities; after depositing mouthfuls of plant materials, animals usually emitted one or two calls while in the vicinity of their haypiles. The call of *O. collaris* has been variously described as a "nasal bleat," a "short, sharp bark," or a ventriloquistic "yink" or "enk" sound, with a metallic twang which makes it audible for a considerable distance. Some detailed descriptions and sonograms of vocalizations of *O. collaris* were presented by Kawamichi (1981). Adult males frequently emitted a steady series of strong "kie" calls, whereas both adults and juveniles of both sexes produce a short call, emitted singly or two or three times in series and varied in loudness. Kawamichi (1981) also noted several other types of sounds from *O. collaris* that included chattering, continuous clicking of the teeth by excited males in the reproductive season; estrous calls by females, successive calls at irregular time intervals; repetitive weak calls accompanying adult males approaching females; and submission calls.

Kawamichi (1981) demonstrated a high degree of similarity in calls between *O. collaris* and *O. princeps*; the only difference was the possession of a distinct chattering "long" call in *O. princeps* and its absence in *O. collaris*. The calls produced by two different species of pikas from the Palearctic, *O. hyperborea* and *O. rufescens*, were different from those produced by *O. collaris*.

**GENETICS.** The diploid number of chromosomes is 68; there are 20 submetacentric autosomes and 46 acrocentric autosomes (Fig. 4). The X chromosome is submetacentric. The Y chromosome is submetacentric also, but is a minute element (Rausch and Ritter, 1973). The diploid number of *O. collaris* is comparable to that of *O. princeps* in North America (Adams, 1971; Hsu and Benirschke, 1971; Wurster et al., 1971), and *O. pusilla* from the Palearctic Steppes (Vorontsov and Ivanitskaya, 1973). *O. hyperborea*, the Palearctic species of pika in closest geographic proximity to *O. collaris*, has a diploid number of only 40 (Vorontsov and Ivanitskaya, 1973).

**REMARKS.** The affinities of the order are uncertain (Diersing, 1984). In addition, there is considerable disagreement in the literature with regard to the classification of pikas below the generic level, particularly in the relationships among four species, *Ochotona collaris*, *O. princeps*, *O. alpina*, and *O. hyperborea*. The two North American species, *O. collaris* and *O. princeps*, have been considered conspecific by some authors (Broadbooks, 1965; Youngman, 1975). Corbet (1978), following Gureev (1964), considered both *O. collaris* and *O. princeps* and the Eurasian *O. hyperborea* conspecific with the Eurasian *O. alpina*. Recent re-evaluations of

morphological (Weston, 1981), behavioral (Kawamichi, 1981), and chromosomal (Vorontsov and Ivanitskaya, 1973) data indicate that *O. collaris*, *O. princeps*, *O. alpina*, and *O. hyperborea* are separate species. We agree with Honacki et al. (1982) that there is little reason for the recognition of subgenera.

Members of the genus *Ochotona* are referred to frequently as pikas, rock conies, mouse hares, and whistling hares. Collared pika is the appropriate vernacular name for *O. collaris* (Jones et al., 1982).

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