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SUMMER PELAGED WEASELS IN WINTER: INDICATION OF WINTER REPRODUCTION

JON HJORTDAL, SVEIN OLAF DAHL & ANNE KARIN HUFTHAMMER

Two weasels *Mustela nivalis* (L.) were observed on April 4 and 18, 1992, respectively, in the western parts of Hardangervidda, southern Norway. The weasels were both in summer pelage (walnut brown above and white below), in a season when the weasel normally has a completely white coat. The first observed weasel was caught, and age-determination showed that it was born during the early winter months. Thus, summer pelaged weasels in winter are a strong indication of successful winter reproduction.

Jon Hjortdal, Dept. of Animal Ecology, Zoological Institute, University of Bergen, Muséplass 3, N-5007 Bergen, Norway.
Svein Olaf Dahl, Dept. of Geology, Sec. B, Allégt. 41, N-5007 Bergen, Norway.
Anne Karin Hufthammer, Museum of Zoology, Zoological Institute, University of Bergen, Muséplass 3, N-5007 Bergen, Norway.

A weasel *Mustela nivalis* (L.) was caught on April 4, 1992, in the roadway between Halne and Dyranut in the low alpine region of the Hardangervidda mountain plateau, central southern Norway (altitude *c.* 1250 m). Another weasel was observed on April 18, 1992, at Liseth in the high boreal region about 30 kilometer west of the first observation (R. Gjelsvik pers. comm.). Both weasels were in summer pelage (walnut brown above and white below, and were therefore very conspicuous in the completely snow-covered terrain.

As described by Stolt (1979) there are two different forms of *M. nivalis,* the northern *M. nivalis nivalis* and the southern *M. nivalis vulgaris.* The two weasels were both of the *nivalis* form that, in contrast to *vulgaris,* normally has a white winter coat till April or early May (Collett 1911—1912, Stolt 1979), and possibly later in alpine areas. A possible explanation for the summer pelages of the two weasels is that they were born during the early winter months. According to Collett (1911—1912) juveniles born at this time of the year do not have winter pelages in their first winter. He investigated three individuals with summer pelage caught in late March and early April and found that all had open cranial sutures, and two of them deciduous teeth, showing that they were juveniles born during the two first months of the year. He also observed open cranial sutures and deciduous teeth on juvenile individuals caught in May that most likely had been born in late winter. Since then winter reproduction in weasels has not been reported in Scandinavia, but has occurred in North America (Banfield 1974, Fitzgerald 1981), where nestlings have been discovered in the wild during the winter months. An alternative explanation for the colour of the two weasels is that they were extreme cases within the variation over time in changing from winter to summar coat.

The first observed weasel was caught for behavioural experiments. Unfortunately the weasel died on June 5, and it was handed over to the Museum of Zoology in Bergen, where morphological registrations were carried out. Its total body length was 212 mm, tail length 46 mm and hind foot length 25 mm, which is about average size for adult male weasels of the *nivalis* form (Stolt 1979). The weasel had developed testes. Maturity and adult weight have been attained in captivity at 12—16 weeks in weasels of the *vulgaris* form (East & Lockie 1964, 1965, Hartman 1964, Heidt et al. 1968), hence the weasel could still have been born during the winter. Morphological investigations showed that the humerus proximal epiphysis had not fully fused with the diaphysis. Unfortunately we had no material of *M. nivalis* available for comparison, however, material of *M. erminea* shows that the humerus proximal epiphyseal plate ossifies at 7—8 months of age, maybe earlier. This indicates that the weasel most likely was less than 7—8 months of age when it died. Tooth sectioning revealed no incremental lines in the tooth cementum. Since *M. nivalis* form incremental lines during November-January (Grue & Jensen 1979), this further strengthens our hypothesis that the weasel was born during the early winter months.

King (1979) found that young English weasels have to complete their first coat before they can moult into their first winter coat. The first coat is completed at about 2 months of age (King 1979), therefore early-winter born weasels cannot start winter moult until mid-winter, only two to three months prior to spring moult. The young may therefore be energetically restricted to moult directly into summer coat to avoid the costs of two succeeding moults within such a short period of time. An alternative would be that weasels moult into winter pelage only under a decreasing light regime.

As stated by Hansson (1984), winter reproduction in small mammals (voles and lemmings) is often, though not always, associated with a rich food supply. One might expect the same for other mammals living in the subnival zone, where the microclimate is much less harsh than on the snow surface. Lemming and vole populations rose to a peak in the autumn of 1991 in parts of Hardangervidda, and throughout the early winter months microtines were observed in the same area as the weasels. Small mustelids hunting microtines in their runways and nests under the snow therefore had good access to prey. We suggest that conditions were optimal with respect to winter reproduction this year, and that this explains the summer pelage of the two weasels.

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SAMMENDRAG

Henholdsvis 4. og 18. april 1992, ble to snømus *Mustela nivalis* (L.) observert på vestsiden av Hardangervidda i Sør-Norge. Begge individene hadde sommerdrakt (valnøtt-brun overside og hvit underside) til tross for at snømus normalt har helt hvit drakt om vinteren. Det første observerte individet ble fanget og aldersbestemmelse viste at det ble født tidligere på vinteren. Sommerdrakt hos snømus om vinteren er derfor en god indikasjon på vinterreproduksjon.

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