Behaviour

Individuality in the alarm calls of an endangered population of the spotted ground squirrel (*Spermophilus suslicus*)

MATROSOVA V[1], VOLODIN I[1,2]

[1]Dept. of Biology, Moscow State Univ., Vorobiovi Gori, 119899, Russia;
l-matrosova@mtu-net.ru
[2]Scientific Research Dept., Moscow Zoo, B. Gruzinskaya, 1, 123242, Russia

Acoustic monitoring of populations has proved useful for many animal groups, especially for birds, whales and bats, but has rarely been applied to rodents. We tested whether the very simple structure in the alarm calls of the spotted ground squirrel reliably coded for the callers identity. Call were recorded between June and August in 2001 and 2002 from an endangered, isolated, small population of squirrels in Moscow province (Russia). We recorded calls from 19 individually marked, live-trapped ground squirrels, during capture-recapture procedures. All these animals were part of a long-term study of demography, viability and relatedness of this population and were of known sex and age. Discriminate function analysis of 403 calls from 14 individuals (29 - 30 calls per individual from 13 animals and 14 calls from one individual) showed 95.3 % correct assignment to individual, and this substantially exceeds the expected random value for 14 animals (7.1 %). Separately for 8 males and for 6 females the values of correct assignment to individual were 97.3 % and 98.9 % respectively. However, the value of correct assignment to sex of 71.5 % (n = 221 call, 105 from 7 females and 116 from 12 males) was close to random (50 %). Thus, calls of this species provided information about the individual identity of the caller but not of its sex. Also, we obtained preliminary data on the stability of individual features in calls between years. In summer 2003 we repeatedly captured and recorded 4 individuals from among those sampled in 2001 and 2002. Discriminate function analysis of 104 calls (30 calls per animal for three and 14 from the forth) from sample of 2001 and 2002 showed 100 % correct assignment. Similar analysis of 120 calls (30 per animal) recorded in 2003 showed 95 % of correct assignment. However, estimation of stability of individual features using a cross-validation procedure (classification of recordings obtained in 2003 using discriminate functions from those obtained in 2001 and 2002) showed the average value of correct assignment to individual to be only 40 % (with random 25 %). Different animals showed 90, 47, 23 and 0 % of correct assignment respectively, i.e. only one animal was distinguished reliably. Thus, calls can be used to reliably identify individuals within a season, but not between them. This research will be prolonged in order to study call stability for more individuals within and between seasons, and to test a hypothesis that the spotted ground squirrels may forget their calls because of known fact - perfect reconstruction of brain structures during hibernation.