Horse signals: the sounds and scents of fury

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Summary

During contests animals typically exchange information about fighting ability. Among feral horses these signals involve olfactory or acoustical elements and each type can effectively terminate contests before physical contact becomes necessary. Dung transplant experiments show that for stallions, irrespective of rank, olfactory signals such as dung sniffing encode information about familiarity suggesting that such signals can be used as signatures. As such they can provide indirect information about fighting ability as long as opponents associate identity with past performance. Play-back experiments, however, show that vocalizations, such as squeals, directly provide information about status regardless of stallion familiarity. Sonographs reveal that squeals of dominants are longer than those of subordinates and that only those of dominants have at their onset high-frequency components.

Keywords: communication; combat; fighting ability; individual identity; signals; information; assessment; displays

Introduction

Combat and communication are inextricably related since contests involve assessment and are settled by differences among individuals in fighting ability, resource valuation, or both (Maynard Smith, 1976; Parker and Rubenstein, 1981). From the earliest moments when two rivals meet, information about fighting ability is transmitted and often prevents contests from escalating to damaging levels. Understanding of how such information is encoded in displays is, however, not yet complete.

During contests between wild animals two different mechanisms have been identified for acquiring information about an opponent's ability. In one, typified by the roaring of red deer (Clutton-Brock and Albon, 1979) and the breast stripe of great tits (Jarvi and Bakken, 1984), signals display status (Rohwer, 1975) or the ability to fight fiercely if challenged. In the other, typified by the plumage markings of wintering turnstones (Whitfield, 1987), or the calls of pikas (Conner, 1985), signals simply indicate identity (Collias, 1943), which can be used to extract information about fighting ability as long as individuals are able to associate an opponent's signature with the outcome of a previous encounter. Here we present the first evidence of both types of signalling occurring during agonistic encounters. In feral horses, vocalizations encode information about status whereas odours provide information about identity.

Signalling and fighting in horses

Most contests among feral stallions inhabiting Shackleford Banks, a barrier island off the coast of North Carolina, are settled quickly with one individual retreating when approached by another;

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Figure 1. Bifurcating tree showing the sequence of events during a sample of 231 agonistic encounters among stallions when females of a resident stallion were at risk of being lost to an approaching stallion. The numbers in parentheses indicate the number of contests that proceeded from the previous stage.