

ARTICLE

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## Play behaviour and active training of Montagu's harrier (*Circus pygargus*) offspring in the post-fledging period

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**Abstract** Play bouts and active training of juveniles by Montagu's harrier (*Circus pygargus*) adults in the post-fledging period were observed. Fledglings often played with prey and with a variety of inanimate objects such as bits of moss, regurgitated pellets, sticks and a wad of hay. Inanimate objects selected for play were, in length, very similar to the common vole (*Microtus arvalis*), which is the most common prey of the species during their breeding period. Some recently fledged individuals were trained to capture invertebrate prey by adults demonstrating techniques for the fledglings and thus develop their hunting skills. Training sessions took place only in the foraging areas of the adult birds.

**Key words** Inanimate objects · Montagu's harrier · Play · Post-fledging period · Training

### Introduction

Play, despite significant energetic cost, seem very important in the developmental process of young animals (Harcourt 1991; Bekoff and Byers 1992; Diamond and Bond 2003) and are frequently observed in young vertebrates throughout the period prior to their gaining independence from their parents (Fagen 1981; Ortega and Bekoff 1987; Gamble and Cristol 2000; Diamond and Bond 2003). Such behaviour is well documented for birds (Fagen 1981; Ortega and Bekoff 1987; Diamond and Bond 2003). Although birds seem to engage in play less intensely than mammals (Barber 1991) and their play can take on various forms, namely social, locomotory and object play (Ficken 1977; Ortega and Bekoff 1987), a distinct trend for playing with inanimate objects was evident (Ficken 1977; Ortega and Bekoff 1987; Gamble and Cristol 2000).

Whereas detailed observations of birds kept in cages are available (Negro et al. 1996; Agostini et al. 1996), the adaptive role of play has been rarely been described for raptors. Data from long term observations of play performed in the field are scarce. The available data on the subject are mostly of an incidental nature (Sherrod 1983; Simmons 1984; Newton 1986), apart from the study carried out in Italy on the Montagu's harrier (*Circus pygargus*) (Pandolfi and Pino D'Astore 1994; Pandolfi 1996). This paper provides an analysis of play behaviour and the process of adult training of fledglings of Montagu's harrier under field conditions.

### Methods

The research was performed in an area of calcareous marshes near Chelm (51°08'N, 23°37'E, SE Poland). I observed 23 juvenile females and 19 juvenile males from 14 Montagu's harrier families. All the observed birds were individually tagged with Saflag foil (Kochert et al. 1983). The age of the nestlings was assessed by noting phenology (i.e. laying and hatching dates) as well as by measurements of the first and fifth primaries. Sex was determined by iris color. In Montagu's harrier the iris is brown-grey and chocolate for young males and females, respectively (Krogulec 1992). I began observations in late June and continued until late August ( $n = 152$  sessions; total 1,824 h). Each session lasted 12 h, 0800–2000 hours. Each family came under observation every 1–4 days. Optical aids were 10 × 50 binoculars and a 25 × 60 telescope. During the study, I noted the type of habitat where each juvenile's activities were performed. Activities of juveniles were also mapped onto 1:10,000 map. All habitats where playing and training activities of juveniles were observed were put to two categories: (1) breeding sites of adults: marshes and meadows and fields close (<400 m) to the nests of the particular semi-colonies, and (2) foraging sites of adults (>400 m from the nest): meadows and crop fields far from the nest where adult Montagu's harrier individuals were frequently observed foraging during post-fledging period. After finishing my

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