

A case of polygamy or co-operative breeding in the Common Kestrel *Falco tinnunculus* in Israel

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Raptor polygamy, although suspected in many species, has rarely been reported (Newton 1979, Hiraldo *et al* 1991, Tella *et al* 1996). The biology of the Common Kestrel *Falco tinnunculus*, typically monogamous, is well-known throughout most of Europe (Village 1990). However, cases of polygamy have been recorded: adult males pairing with two females at different nests (Korpimäki 1988, Village 1990) and two males and a female at one nest (Packham 1985).

In late March 2006, two females and one adult male Common Kestrel were observed usurping an active Hooded Crow *Corvus cornix* nest in a tipu tree *Tipuana tipu* in the village Ram On, Israel (32°31'55"N, 35°15'25"E). In mid-April, the Hooded Crows built another nest in the same tree, 2.5 m from the first nest (Plate 1), and started incubating thereafter. Of the three Common Kestrels at the usurped nest, one female always remained at the nest while the other female and the male hunted, mainly in fields within 500 m of the nest. Since no other Common Kestrel nest in Israel was known to contain two females and a male, the nest was observed intensely to verify that it was indeed occupied by two females and one male.

Even though Common Kestrels are not over-territorial in Israel, nest-separation distances sometimes being as little as 30 m, females do guard the immediate nest site and chase away any other females or males that approach within 5 m (MC pers obs). Because all three Common Kestrels in this case were observed together at the nest many times and because, later, both females were observed feeding the nestlings together, there is no doubt that all three birds participated in raising the nestlings during the breeding period. The female incubating and guarding the nest did not leave it until the other female, and male, returned, so there was always a female at the nest. Unlike this dutiful threesome, the owners of most other Common Kestrel nests observed in Israel frequently left eggs unguarded for various periods throughout the day, when females were seen to eat away from the nest and to preen their feathers.

The clutch size of the threesome remained unknown because of its high location in the tree. However, telescope observations revealed two nestlings 10 days old. Incubation lasts 28 days (Cramp & Simmons 1980), putting the date of laying of the first egg at 4 April. When prey was brought to the nest, often both females would feed the nestlings together, but because they were not colour marked, we cannot be certain how the nest duties were divided between them, nor do we know whether both females laid eggs in the nest. If they had, the behaviour is classed as polygamy, whereas if only one female had laid, it would be co-operative breeding, an event found in many Falconidae, albeit rarely (Kimball *et al* 2003).



Plate 1. Nests occupied by Common Kestrel *Falco tinnunculus* (foreground) and Hooded Crow *Corvus cornix* (background), 2.5 m apart. The Hooded Crow pair built both nests. © Shay Halevi

The Hooded Crows abandoned their second nest on 28 May and shortly thereafter the Common Kestrel nestlings started moving around the tree, visiting both their own and the abandoned crow nest. These two young fledged successfully in the second week of June. The extra food that a second hunting Common Kestrel provides to the nest may be advantageous in an environment where there is a shortage of food. Forty-six regurgitated pellets collected below the kestrel nest were analyzed at Tel Aviv University and contained a total of 49 prey specimens. Rodent remains being found in all pellets (94% of the prey specimens by number), mostly of the Levant vole *Microtus socialis guentheri* (47% of prey specimens by number). Local farmers informed us that large populations of this rodent inflicted great damage in 2006 in fields surrounding the village. Levant voles also formed the main prey species of Long-Eared Owls *Asio otus* at the same village (MC unpubl), despite the availability of other prey (passerines, reptiles and insects). Voles formed the main prey of the kestrels presumably because of the high vole abundance (other prey found in the pellets: one passerine sp, a starred agama *Laudakia stellio* and Coleoptera sp). However, the three-some raised only two nestlings, leading us to believe that the only benefit to the females on this occasion was the increased protection that two females could offer against predation by Hooded Crow. There was always one female kestrel protecting the nest. Korpimäki (1988) noted that, in 9 examples of polygyny in Common Kestrels in Finland, secondary females (females that laid after the first female) fledged smaller broods (a mean of 2.4) than primary females (a mean of 4.6), suggesting that polygyny may be advantageous to Common Kestrel males, but not to all females, and Village (1998) pointed out that up to 12% of Common Kestrel pairs were bigamous, more frequently so in northern populations during peak vole years.

Previous studies of polygamy differed in that seemingly they described 2 females in separate nests 'close' together (Macdonald 1973, Korpimäki 1988, Village 1990). Ours is the first report of polygamy or co-operative breeding in the Common Kestrel where two females and one male bred, or participated in the raising of young, in only one nest.

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