Research Article

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Do male fallow deer (*Dama dama* L) guard female before and after mating.

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In the present study, two hypothesis for male mate guarding were tested. First hypothesis was that male should be able of predicting the timing of female sexual receptivity. Second was how long should mate-guarding occur if this be adopted as a strategy by male fallow buck and associated with guarding female that close to sexual receptivity. It was also tested that can males might be able to predict the future behavior of their mate and act accordingly?. It was noticed that males show little tendency to guard a female after they have mated with her, Bucks showed no greater tendency to guard monogamous females more than multiple maters. Guarding multiple-mating females would intensely affect the total number of matings achieved by each buck.

Key words: Fallow deer, mate guarding, monogamous, polyandrous, Buck

Males and females Fallow deer *Dama dama*, are sexually segregated most of the year and live in separate groups and meet together during the mating season (harty, 2002, Farrell, 2001).

Several authors have suggested that there are male mate guarding occur in many species and play role in the evolution of monogamous and polyandrous female social behaviour (chimpanzee, (Watts 1998) , male feral goats *Capra hircus* (Saunders, *et al*. 2005) male and females Swallowa, *Hirundo rustica*, (Moller 2008), Crickets (1994), Wanger and Reiser 2000

Male mate guarding mean a male a attempt to prevents female from copulate with other male.Feral goat males defend oestrous female from other males and may gain access to the oestrous female by disturbing attending pair,Saunders *et al*. (2005). Clutton-brock (1995) indicate that male force and guarding the female to prevent her of mating with other male.

Male fallow deer *Dama dama* are polygynous, the buck may mate with up to 105 females in a season, while female fallow deer are polyandrous to the extent that ten to twenty percent of females mate with more than one male (Alsaleh 2007, Farrell, 2001, McElligott 1997)., Most of copulation were followed by guarding behaviour, and dominance male guard significantly longer and more effectively that subordinate male (Setchell *et al.* 2005, Wile Hogg, 1984). in contrast, While Arlet, *et al.* (2008) indicated that there were a significant difference in mate guarding by dominance male rank with the mating success, and high rank male does not engage in mate guarding.

The male guarding engages with the rivals, even if the female mate again (Herberstin) male guarding reduce the duration of copulation, usually in St. Andrew's cross spider (Araneidae).

Mate guarding prevents sperm competition, and enhance fertility successs.

The intensity and duration of the male mate guarding depend on the number of male in the population and the number of females receptivity.

In the monogamous species, the attractive male are usually expected to guard by the time less than unattractive males, There were a significant difference in the time invested in mate guarding with tendency of female to copulation, and seek extrapair and the benefit of oestrous female, when it is efficient mate guarding, (Kokko and Morrell 2005). There were a variation in the male mating behaviour, in male ungulate whatever the cost and benefits associated with strategies, (Isvaran 2005, Pelletier 2006). In fallow deer the male alternative mating behaviour strategy associated with

different tactics depend on female mating behaviour (Thirgood 1991).

There are several question appear, and I try to answer it in this paper, can male Identify females that are likely to mate again? How long mate guarding should take if the mate guarding by male fallow deer take and occur if it were to be adopted as a strategy by fallow bucks? How it cost the mate guarding for number of mating opportunity missed. There was no difference in mean intervals between mating and departure of monogamous compared to multiple-mating females. Guarding multiple-mating females would substantially decrease the total of number of matings achieved by each buck.

MATERIALS AND METHODS

This study was carrying out at Phoenix- park in Dublin for two mating season. The written and filmed records of all mattings were examined to identify whether each female mated once or multiply and with whom. In total 62 females 32 (thirty two) were chosen at random from the film records, subject only to the conditions that each had clear recordings of their mating sequence. The mate guarding behavioral of male mate guarding of fallow bucks towards females with whom they had mated studying by record for Five (5) minutes post copulation for each copulate

RESULTS AND DISCUSSION

The composition and the population size of herd during this study is showed in Table (1)

Of these, 84 were monogamous and there were 39 cases of multiple mating (31) of these were polyandrous and 8 were repeat maters) . In 105/123 cases the female made no attempt to leave the vicinity of her mate within five minutes. In the 18 cases (14.6%) where she did so the male attempted to stop her on 6 occasions and in all cases he succeeded in retaining the female for at least 5 minutes, Fig (1).

The high copulatory scores of the most successful males in Phoenix Park are achieved with little or no mate guarding, while the buck appears not to devote much time to guarding individual females or defending harems

There was no difference in the tendencies of monogamous and multiple mating females to attempt to leave the male within 5 minutes after mating (Table 2).

For this situation the male may be lead for gains fitness by monopolizing females.and should attempt to deter a female from mating again with another male it appear while vicinity of female. It talk several form for example: male engage in aggression to prevent females mating with other male, mate guarding associated with territorial, male can predict the time of female will be sexual receptive. When a male remains close to the oestrous female and guard her in the same time allow her to movement around mating area

The behaviour of the fallow bucks towards these females who had mated for the second time was noted for 5 minutes post-copulation to determine whether there was difference between monogamous females and multiple mating females after their second mating

In 97/110 cases the female made no attempt to leave the vicinity of her mate within five minutes. In the 13 cases (12%) where she did so the male attempted to stop her on 3 occasions and in all cases he succeeded in retaining the female for at least 5 minutes

The distribution of departures by monogamous and multiple mating females during the 5 one-minute intervals after mating are shown in table 3. The 9 monogamous females left between the third and the fifth minute (mode, fourth minute, Figure 1) while the 6 polyandrous mating females left during the second and third minutes (mode third minute). No repeat mater females left within 5 minutes after ejaculation (Table 4). There was no greater tendency for polyandrous females after their second mating to leave the male when compared to repeat maters for their second (χ^2 = 0,416, df =1, p = 0.516 ns.).

From this study showed the effect of mate guarding by the male fallow deer, there was no significant different between the bucks attention towards the females whatever was monogamous or multiple mating. Female moorhens *Gallinula chloropus* mating with more than one male and reduced the chance for the other females to mate with the same male Petrie (1992) mate guarding may reduce the number of mating achieved by each buck. We take five (5) minutes after copulation as measuring to mate guarding.

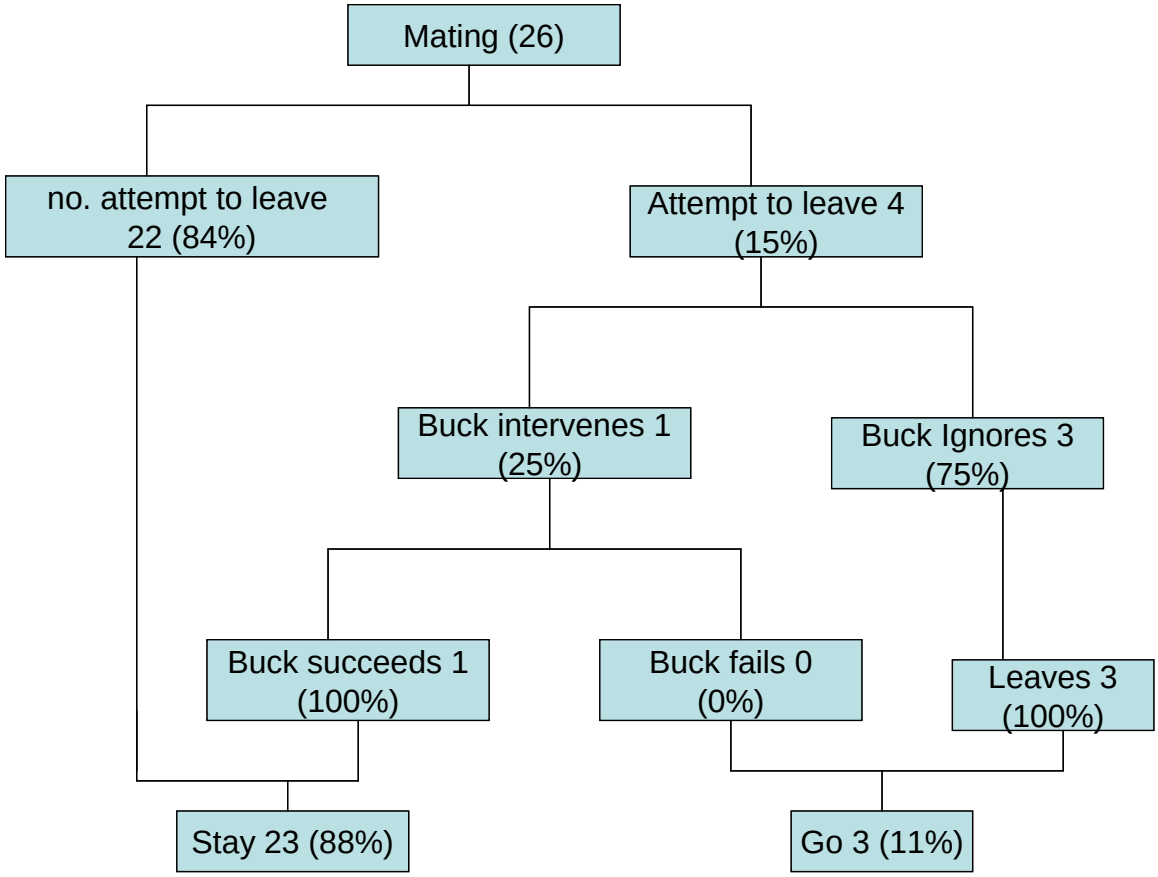

Figure (1) Fate of multiple mating females after their second mating in first and second season.

Table (1) Population size of the fallow deer herd in Phoenix Park during first season and second season

Season	Population	Females	Males	Mature bucks	Immature bucks	Fawns
First	630	297 (47%)	196 (31%)	77 (12%)	119 (19%)	137 (22%)
Second	716	338 (33%)	205 (29%)	87 (12%)	118 (16%)	173 (24%)

Table (2) Distribution of matings of monogamous, repeat mater and polyandrous females in phase 1 (early) phase 2 (middle) and phase 3 (late) of the rut season

	Phase 1	Phase 2	Phase 3
Monogamous	22 (84.6%)	109 (87.2%)	29 (78.3%)
Polyandrous	3 (11.5%)	15 (12%)	5 (13.5%)
Repeat mater	1 (4.5%)	1 (0.08%)	3 (0.08%)

Table (3) Summary of the fate of females during the first five minutes after ejaculation (number of females staying, going, and guarded by the buck in the population

	Monogamous (n)	Multiple maters* (n)	Polyandrous* (n)	Repeat Maters* (n)	Total (n)
Matings	84	39	31	8	123
Females staying	77 (91.6%)	34 (87.1%)	28 (90.3%)	6 (7.5%)	111 (90.2)
Females attempting to leave	9 (10.7%)	9 (23%)	6 (19.3%)	3 (37.5%)	18 (14.6%)
Females ignored by buck	7	5	3	2	12
Buck intervenes	2	4	3	1	6
Buck succeeds	2	4	3	1	6

* The matings represented here are the first mating of each female

Table (4) Summary of the fate of females second mating during the first five minutes after ejaculation (number of females staying, going, and guarded by the in the population

	Monogamous (n)	Multiple maters (n)	Polyandrous (n)	Repeat Maters (n)	Total (n)
Matings	84	26	19	7	110
Females staying	77 (91.6%)	23 (88.4%)	16 (84.2%)	7 (100%)	100
Females attempting to leave	9 (10.7%)	4 (15.3%)	4 (21%)	0	10
Females ignored by buck	7	3	3	0	10
Buck intervenes	2	1	1	0	3
Buck succeeds	2	1	1	0	3

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