Laying pattern and egg mass of captive Asian houbara bustards *Chlamydotis macqueenii* subjected to egg-removal

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Asian houbara bustards *Chlamydotis macqueenii*, inhabit arid plains, and semi-deserts ranging from the Gobi desert to the Nile Valley. In response to marked population declines of *C.macqueenii* in Arabia, a captive-breeding programme was initiated in 1986 at the National Wildlife Research Center (NWRC), Taif, Saudi Arabia, with the purposes of reintroducing this species into its former habitat. Wild Asian houbara bustard lay a clutch of one to five eggs. Captive Asian houbara bustards at the NWRC lay between January and June and are subjected to egg-removal. Captive-laid eggs are on average smaller than eggs collected from the wild. This study examined the “within breeding season” egg-laying pattern of captive houbara subjected to egg-removal between 1999 and 2002. Because eggs are removed from captive birds on laying, clutch size is difficult to define. In this study, “laying sequence” refers to eggs laid consecutively with an interval of not more than four days, and “laying series” refers to the entire number of eggs laid by a female within season.

Of 1001 laying sequences, 34.4% consisted of one egg, 53.1% of two eggs, and 11% of three eggs. The remaining 1.5% sequences consisted of more than 3 eggs. Among 348 laying series, 28% comprised one laying sequence of one to three eggs, 55% two-to-four laying sequences and 17% five-to-ten laying sequences. The most common interval between two consecutive eggs from the same laying sequence was two days. The interval between first eggs of two consecutive laying sequences of one-to-two eggs was 12.4 ± 0.2 days without effect of the laying sequence size, but this interval varied when laying sequences consisted of three eggs.

Egg mass of captive *C.macqueenii* varied widely, from <35g to >70g with an average of 55.33g. The difference between the mass of two consecutive eggs varies significantly with inter-egg interval. Egg mass decreased during a laying sequence. Within a laying series, the drop in egg mass was greater in first-laid laying sequence than in subsequent laying sequences. The first egg of the first laying sequence was heavier than first eggs in subsequent laying sequences. The mass of the first egg of subsequent laying sequences did not vary significantly with respect to the sequential number of laying sequence. The second egg of subsequent laying sequences was lighter than the second egg of the first laying sequence. The last egg of laying sequences that comprised more than one egg was lighter than the first egg of the following laying sequence.

In conclusion, eggs belonging to the first laying sequence of captive houbara did not differ in mass from eggs laid by NWRC captive-born houbara released in a Saudi Protected Area. In contrast, later laying sequences consisted of smaller eggs.
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