MATING BEHAVIOUR OF THE AUSTRALIAN BRUSH-TURKEY *Alectura lathami*

The role of male aggression in shaping sexual conflict, female choice and female competition

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Thesis abstract

Australian brush-turkeys, *Alectura lathami*, are member of the megapode clade (Family Megapodidae). Uniquely among birds, megapodes incubate their eggs using environmental sources of heat, usually microbial decomposition in a mound of soil and rotting vegetation. On the basis of this ancestral pattern, variations have evolved. Although most megapodes are monogamous, brush-turkeys are both polygynous and polyandrous. In the brush-turkey mating system, males construct incubation mounds, defend them against rival males, control their temperature via ongoing maintenance and mate with multiple females each season. Females visit mounds, often copulate with the male and periodically dig large holes in the mound in order to bury their eggs. Chicks are entirely left to their own devices, including having to dig their own way out of the mound. Females are not subject to mate-guarding, do not pair-bond with the male and also mate multiply, although apparently not as multiply as the male.

Male behavior toward females in this species is characterized by an unexpectedly high level of aggression. Here I found that males attempt to obtain copulations by harassing females and, contrary to the pattern in most species where sexual coercion is employed, it is dominant mound-owning males rather than subordinates who are coercive (chapter 1). By standing close to the female and periodically delivering pecks to her body (up-close aggression), males also respond aggressively to female digging, probing and scratching in the mound, especially during egg-laying visits, where there is a clear shift from sexual harassment to up-close aggression in the later phase of visits (chapter 2). The explanation for these unusual male behaviors is not immediately clear, but arguably emerges once a broader picture of brush-turkey interactions is developed. Sexual conflict is ubiquitous during female visits to mounds, with females resisting coercive mating attempts and males resisting female digging, probing and scratching in the mound. Females respond to male aggression both tactically during their mound visits and strategically via a visiting pattern which produces a gradual reduction in male aggression over time (chapter 3). The principal cue for female choice in this species is male-mound information such as the degree to which the male maintains his mound, this being the best available source of information about mound quality when females make mate-choice assessments at a distance from aggressive male owners (chapter 4). Female brush-turkeys compete with each other for access to mounds (chapter 5) partly because access is limited by the duration of female visits to mounds, extended duration being a key strategy used by females to reduce male aggression over a series of visits. Male aggression toward females therefore influences copulation (chapter 1), female choice (chapter 4) and sex roles (chapter 5) in this species. It is also a key component in sexual conflict (chapter 3) and constitutes the primary male response to females during egg-laying visits (chapter 2). The most parsimonious explanation for sexual coercion by dominant males, for the male aggression characteristic of egg-laying visits and for a seemingly counter-productive degree of sexual conflict is both a by-product and a life-history one, namely that social interactions are agonistic by default in this species. Brush-turkey chicks lead an independent existence from the time of hatching,

generally do not aggregate until they have become juveniles and never develop a pair-bond in a mating system in which both sexes mate multiply. Strong interdependencies between these findings confirm the importance of by-product explanations in behavioural ecology.

Statement of Candidate

I certify that the work in this thesis entitled "**Mating behaviour of the Australian brush-turkey *Alectura lathami***" has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree to any other university or institution other than Macquarie University.

I also certify that the thesis is an original piece of research and it has been written by me. Any help and assistance that I have received in my research work and the preparation of the thesis itself have been appropriately acknowledged.

In addition, I certify that all information sources and literature used are indicated in the thesis.

The research presented in this thesis was approved by Macquarie University Ethics Review Committee, reference number: **2007/014** on **23 August 2007**

David Alan Wells (**41117670**)

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Note:

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