Stay-at-home parents make for a cooperative family of lizards

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The great desert burrowing skink, a lizard living on the sandy plains of Central Australia, has been discovered to live in family groups within elaborately constructed tunnel complexes. Published in *PLoS One,* researchers Steve McAlpin, Paul Duckett and Adam Stow from Macquarie University, in partnership with Parks Australia, found that family members of the great desert burrowing skink contribute to the construction and maintenance of burrow systems that can have up to 20 entrances, extend over 13 meters, and even have their own specifically located latrines. That these social lizards invest in a long-term housing structure that benefits them, their offspring or siblings is unprecedented in a lizard and may provide a unique insight into the evolution of family groups and cooperation. According to the researchers, the faithful nature of adult pairs, which were found to breed together over consecutive years, is likely to be essential for this family cohesion, though they also observed that 40 percent of the male lizards had produced offspring with different females.

This work was carried out at Uluru – Kata Tjuta National Park as part of Steve McAlpin's research for his Masters degree under the supervision of Dr Adam Stow. It has revealed fascinating life history traits of a lizard species that is listed as threatened. From over 5000 species of lizard worldwide, no other has been found to cooperate to construct a long-term home for their family members.

The shared home of the great desert skink, Liopholis kintorei, can be continuously occupied for up to 7 years. Multiple generations participate

in construction and maintenance of burrows, with tunnels mostly excavated and maintained by adults, and immature lizards contributing small 'pop' holes to the network. Parental assignments based on DNA analysis show that immature individuals within the same burrow were mostly full siblings (all immature lizards were full siblings in 18 of 24 burrow systems), even when several age cohorts were present. Offspring were therefore delaying their dispersal to stay at home. Parents were always captured at burrows containing their offspring, and females were only detected breeding with the same male both within- and across seasons.

"For adults to invest so much in a home within which kids mature, it makes evolutionary sense that these adult individuals are sure that they are providing for their own offspring," says Dr. Adam Stow, Senior Lecturer in Biology at Macquarie University, New South Wales, Australia.

The construction and maintenance of a long-term family home occurs in many other taxa; in vertebrates there are examples from most phyla. Cooperative behaviours generally occur among related individuals, but mate fidelity is not common in lizard species, and this may explain the rarity of such social behaviour. Future work will further investigate the parental care that the great desert skink provides, the effort different individuals put into home making and identifying lazy siblings that might be shirking their home maintenance responsibilities, and how this is managed by other group members.

More information: McAlpin S, Duckett P, Stow A (2011) Lizards Cooperatively Tunnel to Construct a Long-Term Home for Family Members. PLoS ONE 6(5): e19041. doi:10.1371/journal.pone.0019041