Cold-blooded care: understanding reptile care and implications for their welfare

Oliver H.P. Burman[1], Lisa M. Collins[1], Tatjana Hoehfurtner[1], Martin Whitehead[2] and Anna Wilkinson[1]

[1]School of Life Sciences, University of Lincoln, Lincoln LN6 7DL, UK
[2]Chipping Norton Veterinary Hospital, Chipping Norton, Oxfordshire, UK

Corresponding author: Anna Wilkinson. Email: awilkinson@lincoln.ac.uk

---

The keeping of reptiles as pets, both nationally and internationally, has become increasingly common in recent years (RSPCA 2004; APPMA 2015), with some estimates of captive reptile numbers suggesting that UK populations are even larger than those species more typically considered as pets (e.g. 7.5% of pet-owning households own reptiles compared with 2.5% hamsters and 2.5% guinea-pigs (PFMA 2016)). Many species of reptile are considered unsuitable for private husbandry (RSPCA 2002; BVA *et al*. 2015), and therefore they represent a potentially huge welfare concern that needs addressing. What limited evidence there is indicates that almost half of all reptile-owners experience unexpected problems with their pets (Blue Cross 2005). Even when captive-bred, reptiles remain undomesticated wild animals and their needs are diverse and highly specialist. Reptiles can be relatively behaviourally inflexible and extremely sensitive to environmental change, resulting in a poor ability to cope with imperfect captive conditions (RSPCA 2002). Such specialist requirements are difficult to meet and may be beyond the knowledge and/or means of pet owners.

With so little understood about how reptiles respond to environmental challenges and stressors, it is often incorrectly assumed that reptiles cope well with captivity and are both easy and cheap to keep; but in reality they suffer a high morbidity and mortality in captivity (RSPCA 2002). For many pet reptiles the first recognised indications of an inability to cope are 'late-stage' signs such as wounds, disease, dehydration, malnutrition and even death. This late identification of severe welfare issues, that would be considered unacceptable for mammalian species, suggests that large numbers of captive reptiles are experiencing considerable suffering. This lack of understanding about the care needs of exotic pets has been recognised by the British Veterinary Association Animal Welfare Foundation Discussion Forum as being a welfare priority of primary importance (BVA & AWF 2010, 2016). A major reason for our inability to determine welfare

problems in reptiles at a sufficiently early stage is that comparatively little is known about reptile biology and behaviour and even less about appropriate welfare assessment. For instance, from 2000-2004, an average of 3% of research articles published in the Journal of Comparative Psychology involved reptiles, compared with 18% for birds and 74% for mammals (Burghardt 2006). Little has improved since then and as such there is a clear imbalance in the scientific understanding of reptile behaviour and cognition and, by implication, welfare compared with other taxonomic categories.

Those studies that have attempted to examine this issue (e.g. Cabanac & Bernieri 2000; Zwart 2001; Warwick *et al*. 2013), whilst valuable in themselves, have typically used few measures of welfare and/or limited sample sizes. Current methods of animal welfare assessment, which have been developed and refined in mammals and birds, include: the measurement of behavioural, physiological and cognitive indicators of positive and negative welfare; techniques to determine animal choice/preference; and measures of animal (physical) health (Burman *et al*. 2008a, 2008b; Mason *et al*. 2001; Cooper & Nicol 1991). There has, however, been surprisingly little research into whether these methods are also effective for reptiles; it is also difficult to implement these methods due to the lack of research and understanding of reptile behaviour. Recent research has revealed more commonalities between reptiles and the other amniotic classes than previously suspected, particularly in terms of their cognitive abilities (e.g. Wilkinson *et al*. 2007; Wilkinson *et al*. 2010; Mueller-Paul *et al*. 2014; Kis *et al*. 2015), and these findings emphasise the need for reptiles to experience cognitively complex environments. However, reptiles, as well as showing considerable within-class variation, differ considerably from mammals in their behaviour and physiology, which strongly influences how their welfare can be reliably assessed.

We hope to develop a comprehensive programme of research to identify methods of welfare assessment for reptiles. To kick this off we are keen to gather information from the reptile-owning public with the aim of investigating their knowledge about their animals' needs and their approach to the husbandry and care of their animals. This will take the shape of a number of survey-based studies in which we will investigate owner expertise, animal health and care from both the perspective of veterinary surgeons and owners and the relationship between humans and their reptile pets.

We are keen to get information from a wide variety of owners. We would therefore very much appreciate it if members of BCG would fill in the surveys and we will be contacting you with links to them.

References

APPMA (2015). *Pet population figures*.

Blue Cross (2005). Pet census reveals problems with reptile ownership. *Veterinary Record* 157(25): 788.

Burghardt, G.M. (2006). Editorial: Journal of Comparative Psychology. *Journal of Comparative Psychology* 120(2): 77-78.

Burman, O., Owen, D., AbouIsmail, U. & Mendl, M. (2008a). Removing individual rats affects indicators of welfare in the remaining group members. *Physiology and Behavior* 93(1-2): 89-96.

Burman, O., Parker, R., Paul, E. & Mendl, M. (2008b). Sensitivity to reward loss as an indicator of animal emotion and welfare. *Biology letters* 4(4): 330-3.

BVA & AWF (2010). *BVA AWF discussion forum 2010*. [Online]. Available from: http://www.bva-awf.org.uk/headlines/BVA_AWF_DF_2010_Summary.pdf (accessed 16/11/2010).

BVA & AWF (2016). *BVA AWF discussion forum 2016*. [Online]. Available from: http://www.bva-awf.org.uk/sites/bva- awf.org.uk/files/user/awf_df_2016_prog_final.pdf.

BVA, BSAVA, BVZS & FVS (2015). *Policy statement on non-traditional companion animals*.

Cabanac, M. & Bernieri, C. (2000). Behavioral rise in body temperature and tachycardia by handling of a turtle (*Clemmys insculpta*). *Behavioural Processes* 49(2): 61-68.

Cooper, J.J. & Nicol, C.J. (1991). Stereotypic behaviour affects environmental preference in bank voles, *Clethrionomys glareolus*. *Animal Behaviour* 41(6): 971-977.

Kis, A., Huber, L. & Wilkinson, A. (2015). Social learning by imitation in a reptile (*Pogona vitticeps*). *Animal Cognition* 18(1): 325-331.

Mason, G., Cooper, J. & Clarebrough, C. (2001). Frustrations of fur farmed mink. *Nature* 410 (March): 35-36.

Mueller-Paul, J., Wilkinson, A., Aust, U., Steurer, M., Hall, G. & Huber, L. (2014). Touchscreen performance and knowledge transfer in the red-footed tortoise (*Chelonoidis carbonaria*). *Behavioural Processes* 106: 187-192.

PFMA (2016). *Pet population figures*.

RSPCA (2002). *Far from home – reptiles that suffer and die in captivity*.

RSPCA (2004). *Handle with care – A look at the exotic animal pet trade*. [Online]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/24565293.

Warwick, C., Arena, P., Lindley, S., Jessop, M. & Steedman, C. (2013). Assessing reptile welfare using behavioural criteria. *In Practice* 35(3): 123-131.

Wilkinson, A., Chan, H. & Hall, G. (2007). Spatial learning and memory in the tortoise (*Geochelone carbonaria*). *Journal of Comparative Psychology* 121: 412-418.

Wilkinson, A., Kuenstner, K., Mueller, J. & Huber, L. (2010). Social learning in a non-social reptile (*Geochelone carbonaria*). *Biology letters* 6(5): 614-6.

Zwart, P. (2001). Pathophysiology: Assessment of the husbandry problems of reptiles on the basis of pathophysiological findings: A review. *The Veterinary quarterly* 23(4): 140-147.