**Highlights**

- Behavioural flexibility is key for animals adapting to environmental changes.

- Prenatal stress and incubation temperature were hypothesized to affect this flexibility in two lizard species.

- Contrary to expectations, behavioural flexibility was robust to both prenatal conditions in both species.

- No significant differences were found in reversal learning between the invasive *L. delicata* and *L. guichenoti*.

**Keywords**

Behavioural flexibility; stress; corticosterone; incubation temperature; lizards; cognition