**Supplementary Material**

**Non-reproductive male cane toads (*Rhinella marina*) withhold sex-identifying information from their rivals**

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**Supplementary Table 1.** Methodology for scoring secondary sexual characteristics in male cane toads (*Rhinella marina*).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Secondary sexual characteristic** | **Scoring method** | **Score = 0** | **Score = 1** | **Score = 2** |
| Release call | Grasp toad under armpits for 5 sec to mimic amplexus | No sound | Weak call | Strong call |
| Blackness of nuptial pads  (see figure 1*a*) | Examine thumb and adjacent finger | No black | Black patch on thumb only | Thumb and adjacent finger both black |
| Skin colour  (see figure 1*b*) | Examine beneath armpits and across shoulders | No deviation from female colouration | Light yellow | Bright yellow |
| Skin rugosity | Feel dorsal skin | Smooth | Slightly rough | Very rough |

**Supplementary Table 2.** Morphological and behavioural traits of adult male cane toads collected during four seasons of the year, from sites near Darwin, Northern Territory. The Table shows mean values and associated standard errors. For ease of presentation we have treated ordinal variables (call, skin rugosity, skin colour, nuptial pad development) as if they were continuous variables (ranked scores ranging from 0–2). Sample sizes = Build-down 177, Dry 132, Build-up 184, Wet 160. Table shows mean values plus associated standard errors.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Season** | | | |
| **Trait** | **Build-down** | **Dry** | **Build-up** | **Wet** |
| Body mass (g) | 128.69 ± 3.25 | 119.75 ± 4.06 | 112.75 ± 3.03 | 135.08 ± 3.38 |
| Snout-urostyle length (mm) | 100.95 ± 0.85 | 100.67 ± 0.94 | 99.57 ± 0.82 | 102.27 ± 0.85 |
| Testis mass (g) | 0.21 ± 0.01 | 0.22 ± 0.01 | 0.23 ± 0.01 | 0.23 ± 0.01 |
| Release call | 1.20 ± 0.07 | 1.14 ± 0.08 | 1.19 ± 0.07 | 1.10 ± 0.07 |
| Nuptial pads | 1.40 ± 0.06 | 1.36 ± 0.08 | 1.28 ± 0.07 | 1.56 ± 0.06 |
| Skin colour | 1.03 ± 0.07 | 1.27 ± 0.08 | 1.18 ± 0.06 | 1.19 ± 0.06 |
| Skin rugosity | 1.30 ± 0.07 | 1.27 ± 0.08 | 1.23 ± 0.07 | 1.37 ± 0.07 |