Tortoise Shell-ter Project

(Highlighted in yellow are uncertainties that can be discussed further)

***Browse preference study***

Obj: To study browse preference in 5 species of tortoises from different geographical regions; and how different browse influence fecal score and activity levels of tortoises.

Aim: To introduce and increase browse consumption in tortoises – substitute cut hay mixed into daily diet with naturalistic diet.

|  |  |
| --- | --- |
| Animals involved | Region |
| 2.2 Burmese Star Tortoise *(Geochelone platynota)* | Southeast Asia |
| 1.2 Indian Star Tortoise *(Geochelone elegans)* | Southern Asia |
| 1.2 Leopard Tortoise *(Stigmochelys pardalis)* | Southern Africa |
| 1.1 Ploughshare Tortoise *(Astrochelys yniphora)* | Southern Africa |
| 1.1 Hermann’s Tortoise *(Testudo hermanni)* | Southern Europe |

Materials required:

* 5 browse species from WNC, including hay.

Table 1. Combination and pairing for the five proposed browse species.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Browse A (Hay) | Browse B | Browse C | Browse D | Browse E |
| Browse A (Hay) |  | AB | AC | AD | AE |
| Browse B |  |  | BC | BD | BE |
| Browse C |  |  |  | CD | CE |
| Browse D |  |  |  |  | DE |
| Browse E |  |  |  |  |  |

Total number of pairings: 10

Table 1. Newly proposed weekly schedule for sampling browse preference for each tortoise species. Browses A-E are still pending confirmation from PH.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Week** | **Mon** | **Tue** | **Wed** | **Thu** | **Fri** |
| **1** | AB | AE | AD | AC | BE |
| **2** | AC | BE | BD | BC | CE |
| **3** | BC | CE | CD | AD | DE |
| **4** | AD | DE | AE | BD | AB |
| **5** | BD | AB | BE | CD | AC |
| **6** | CD | AC | CE | AE | BC |
| **7** | AE | BC | DE | BE | AD |
| **8** | BE | AD | AB | CE | BD |
| **9** | CE | BD | AC | DE | CD |
| **10** | DE | CD | BC | AB | AE |

Methods:

* Introduce a pair of browse bundles into animal’s exhibit and observe if browse preference is present.
* Browse presentation: Leaves (slightly elevated; tie on existing branches), Grass (planted on ground)
* Observation window: 60-min; 2 times a day
  + 10:30am – 11:30am
  + 1:30pm – 2:30pm
* Normal diet will be given after 11:30am
* 2 pairings (randomized) in 1 day; all 10 pairings (randomized) in 5 days
* 1 week 1 exhibit
* 10 weeks of data collection
  + Intern will be around for 12 weeks; use 1-2 weeks for training and trials.
* Ethogram reading – 1 min intervals
* Browse preparation – WNC send in the morning and intern prepares bundles in the morning
* Data collection – Weigh browse before/after(?) or base preference on number of times browse was visited/duration of time spent eating browse

DJ Proposed methods:

* One observation session per day (Observation hours: 9 am to 11 am)
* 5 species to be sampled within each session
* Randomisation of offered browse species across 10 weeks provided in Table 2 above.
* Each subject (i.e., tortoise species) to be observed for 20 mins per browse combination (e.g., AC, DC etc)
  + Order of studied subjects are randomized within a day (i.e., account for time of day)
  + 5 \* 20 min = 100 min per day
    - Total time taken: +/- 2 h (including prep work)
    - Each species is observed for 1000 min (after 10 weeks)
  + Normal diet to be provided after 11 am or after observations.
  + For e.g., Week 1,
    - Monday, all species to be given browse combination AB, Tuesday = AE, etc.
  + So, each subject samples one browse species about 20 times, and is subjected to each pair-wise browse combinations 4 times.
* Ethogram: Food preference
  + Food preference:
    - Focal sampling (i.e., only sample interested, active individuals)
    - Frequency of bite counts on targeted browse species
      * E.g., 250 and 120 bites of browse A and B (respectively) per 20 min observation (Table 3)
    - Collect data corresponding to Table 3.
* Husbandry begins at 8 am for TS’s intern
  + Fecal scoring during morning husbandry or
  + Fecal scoring during evening husbandry ?
  + Fecal collection can take place for parasite checks.
* Data collection – Weigh browse before/after(?) or base preference on number of times browse was visited/duration of time spent eating browse

Table 3: Example of collected dataset

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Bites** | **Browse** | **Day** | **Species** | **Individual** | **Sex** | **Weekly weight** | **Temperature** | **Time** |
| 250 | A | Monday | Indian Star | Sam | Male | 500 | 35 | 930 |
| 100 | B | Monday | Indian Star | Roy | Male | 200 | 35 | 930 |

Ethogram

|  |  |
| --- | --- |
| Behaviors | Group |
| Sleeping | Non-active |
| Resting | Non-active |
| Walking | Active |
| Walking to browse | Active |
| Smelling browse | Active |
| Eating Browse (Hanging leaves) | Active |
| Eating Browse (Planted grass) | Active |
| Eating Browse (Exhibit) | Active |
| Drinking/Soaking | Active |
| Defecating | Active |
| Courtship | Active |
| Mating | Active |
| Aggressive Interaction | Active |
| Non-aggressive Interaction | Active |
| Others | N/A |

Fecal scoring:  
- Day 1 and Day 5 (?)

Discussion:

* Rank browse according to consumption per bundle pairs

Future project

* Can we do parasite load study based on browse?
  + Send fecal for weekly check?
  + See if browse affect parasite load