|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Trophic association survey** | | | | | | | |
| Species | National Park | | Riverside | | Park + Riverside | | Village + Riverside | |
|  | IndVal | *P* | IndVal | *P* | IndVal | *P* | IndVal | *P* |
| *Metacatharsius opacus* | 0.69 | 0.13 | - | - | - | - | - | - |
| *Caccobius cavatus* | 0.68 | 0.29 | - | - | - | - | - | - |
| *Caccobius nigritulus* | 0.64 | 0.24 | - | - | - | - | - | - |
| *Pedaria sp. (Kalahari)* | 0.59 | 0.18 | - | - | - | - | - | - |
| *Catharsius calaharicus* | 0.59 | 0.28 | - | - | - | - | - | - |
| *Scarabeaus goryi* | 0.56 | 0.31 | - | - | - | - | - | - |
|  | Cattle | | Cattle+Zebra | | Cattle+Zebra+Elephant | | Non-ruminant | |
|  | IndVal | *P* | IndVal | *P* | IndVal | *P* | IndVal | *P* |
| *Neosisyphus calcaratus* | 0.71 | 0.209 | - | - | - | - | - | - |
| *Euoniticellus intermedius* | 0.61 | 0.542 | - | - | - | - | - | - |
| *Gymnopleurus ignitus* | 0.61 | 0.44 | - | - | - | - | - | - |
| *Kepher prodigiosus* | - | - | 0.75 | 0.249 | - | - | - | - |
| *Onthophagus pullus* | - | - | 0.61 | 0.555 | - | - | - | - |
| *Kurtops signatus* | - | - | - | - | 0.92 | 0.235 | - | - |
| *Onthophagus stellio* | - | - | - | - | 0.86 | 0.48 | - | - |
| *Onthophagus sp. nr sugillatus* | - | - | - | - | 0.86 | 0.48 | - | - |
| *Caccobius cavatus* | - | - | - | - | 0.76 | 0.4 | 0.67 | 0.3 |
| *Caccobius ferrugineus* | - | - | - | - | 0.76 | 0.61 | - | - |
| *Onthophagus vinctus* | - | - | - | - | 0.71 | 0.46 | 0.7 | 0.13 |
| *Caccobius nigritulus* | - | - | - | - | 0.71 | 0.45 | - | - |
| *Copris elephenor* | - | - | - | - | 0.7 | 0.7 | - | - |
| *Copris cornifrons* | - | - | - | - | 0.68 | 0.72 | - | - |
| *Onthophagus granulatus* | - | - | - | - | 0.67 | 0.7 | - | - |
| *Catharsius calaharicus* | - | - | - | - | 0.65 | 0.65 | 0.59 | 0.23 |
| *Metacatharsius opacus* | - | - | - | - | 0.63 | 0.9 | - | - |
| *Pedaria sp. (Kalahari)* | - | - | - | - | 0.58 | 0.85 | 0.52 | 0.32 |
| *Afrostrandius plebejus* | - | - | - | - | 0.58 | 0.87 | 0.51 | 0.57 |
| *Cleptocaccobius viridicollis* | - | - | - | - | 0.58 | 0.86 | - | - |
| *Onthophagiini sp. 2* | - | - | - | - | - | - | 0.71 | 0.085 |
| *Onitis sp. 1* | - | - | - | - | - | - | 0.61 | 0.22 |
| *Onthophagus sp. 13* | - | - | - | - | - | - | 0.61 | 0.2 |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | Diurnal | | Nocturnal/crepuscular | |  |  |  |  |
|  | IndVal | *P* | IndVal | *P* |  |  |  |  |
| *Kurtops quadraticeps* | 0.85 | 0.037\* | - | - |  |  |  |  |
| *Gymnopleurus ignitus* | 0.71 | 0.07 | - | - |  |  |  |  |
| *Cleptocaccobius viridicollis* | 0.71 | 0.072 | - | - |  |  |  |  |
| *Euoniticellus intermedius* | 0.61 | 0.2 | - | - |  |  |  |  |
| *Onthophagus pullus* | 0.61 | 0.18 | - | - |  |  |  |  |
| *Metacatharsius troglodytes* | - | - | 1 | 0.001\*\* |  |  |  |  |
| *Digitonthophagus gazella* | - | - | 1 | 0.001\*\* |  |  |  |  |
| *Onthophagus fimetarius* | - | - | 1 | 0.001\*\* |  |  |  |  |
| *Onthiohagus stellio* | - | - | 1 | 0.001\*\* |  |  |  |  |
| *Caccobius ferrugineus* | - | - | 1 | 0.001\*\* |  |  |  |  |
| *Onthophagus sp. nr sugillatus* | - | - | 0.998 | 0.002\* |  |  |  |  |
| *Scarabeaus zambezianus* | - | - | 0.997 | 0.001\*\* |  |  |  |  |
| *Kurtops signatus* | - | - | 0.98 | 0.001\*\* |  |  |  |  |
| *Copris elephenor* | - | - | 0.94 | 0.002\* |  |  |  |  |
| *Onthophagus granulatus* | - | - | 0.94 | 0.002\* |  |  |  |  |
| *Metacatharsius opacus* | - | - | 0.87 | 0.007\* |  |  |  |  |
| *Onthophagus vinctus* | - | - | 9.87 | 0.007\* |  |  |  |  |
| *Caccobius cavatus* | - | - | 0.86 | 0.007\* |  |  |  |  |
| *Copris cornifrons* | - | - | 0.85 | 0.009\* |  |  |  |  |
| *Catharsius calaharicus* | - | - | 0.79 | 0.03\* |  |  |  |  |
| *Caccobius nigritulus* | - | - | 0.77 | 0.048\* |  |  |  |  |
| *Kepher prodigiosus* | - | - | 0.75 | 0.097 |  |  |  |  |
| *Scarabeaus goryi* | - | - | 0.71 | 0.075 |  |  |  |  |
| *Pedaria sp. (Kalahari)* | - | - | 0.71 | 0.082 |  |  |  |  |
| *Afrostrandius plebejus* | - | - | 0.71 | 0.081 |  |  |  |  |
| *Onthophagiini sp. 2* | - | - | 0.71 | 0.079 |  |  |  |  |
| *Onitis sp. 1* | - | - | 0.61 | 0.19 |  |  |  |  |
| *Onthophagus sp. 13* | - | - | 0.61 | 0.2 |  |  |  |  |