During drought the gazelles spent significantly more time browsing (51.0%) than less grazing (49.0%, Figs. 3A, B) than under non-drought conditions (17.6%, grazing; 82.4%, browsing, MWR-test, p<0.001). Regardless season or sex, Sand Gazelles consumed significantly more grass (58.4%) than browse (41.6%, P<0.001). Moving is a measure of search activity, which increases if food availability is low.

**Behaviour:** Sand Gazelles are considered mixed feeders (Fig. 3A and B), switching to more grass in their diet during periods of higher productivity. **Tooth wear:** the mesowear signature (Figs. 4A, B) is not congruent with the mixed feeding style (beverage). Since dicotyledonous browse plants rarely bear silica phytoliths (Piperno 2006, Piperno et al. 2002) grit or dust has to be the abrasive agent.

**Research Unit 771, German Research Foundation**

**Figure 1** (A) Male Sand Gazelle in the protected area of Mahazat as-Sayd (Saudi Arabia).

**Figure 1** (B) The distribution (grey areas) of the Sand Gazelle in the Middle East.

<table>
<thead>
<tr>
<th>Lusitania</th>
<th>Connochaetes taurinus</th>
<th>Capra pyrenaica</th>
<th>Cervus elaphus</th>
<th>Capreolus capreolus</th>
<th>Taurotragus oryx</th>
<th>Capra aegagrus</th>
<th>G. dorcas</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
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**Acknowledgment**

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**References**


Foraging observations were conducted over a period of one year from April 2002 to March 2003. AFA modified according Owen-Smith (1979) and Duchman (1992). A total of 62 males and 58 females were sampled. Direct observations were made from a vehicle at distances ranging from 50 to 200 m. Mesowear analysis using slab and skull fragments of 53 individuals collected from mammified carcasses (01-2006 to 03-2008), mesowear analysis according to Fortelius & Solounias (2000). Hierarchical cluster analysis (complete linkage/furthest neighbours) as well as Mann-Whitney Rank Sum tests (MWR), and Pearson r-tests (P) calculated using SYSTAT 11.0 (SYSTAT Software Inc., Richmond, CA).

**3. Tooth wear**

![Comparison of the tooth wear with other ruminants reveals that mesowear signature represents the “grazing” spectrum with a tendency towards mixed feeding. This is not congruent with the graze and browse components in its diet. Surprisingly the browsing components of the diet are less reflected in the mesowear signature (Fig. 4).](image-url)

Gazella dorcas

Gazella leptoceros

Nanger granti

Eudorcas rufoangulata

Eudorcas thomsoni

Capricornis sumatraensis

Capreolus capreolus

Hippotragus equinus

Caprelus capreolus

Okapia johnstoni

Dicerorhinus sumatraensis

Ovibos moschatus

Kobus ellipipippinus

**4. Conclusion**

The dietary adaptation of the extant Sand Gazelle *Gazella marica* THOMAS, 1897 from the Mahazat as-Sayd Protected Area (Saudi Arabia) (Figs. 1A, B) is evaluated using a behavioral method to determine food preferences (Fig. 2) in conjunction with an eco-morphological method examining the tooth wear.

**Figure 2** Absolute frequency of food plants given as percentage in relation to the total amount of the specific plant. *Gria* grasses, *B* forbs/trees/shrubs. The diet of the extant *Gazella marica* gives per season and drought/non-drought according Cunningham (2009).

**Figure 3** (A) Bar charts showing the mesowear signatures of the second upper molars in *Gazella marica* (wet-drought, A) and *Gazella dorcas* (wet-drought, B). S. Afr. J. Wildl. Res. 12, 36–40. / Fortelius, M. & Solounias, N. (2000). Functional characterization of ungulate molars using the abrasion-attrition wear gradient: A new method for reconstructing palaeo-diets. Novitates 3301, 1-36. / Louys, J., Piveteau, P. & Bishop, L. C. (2011). Mesowear as a means of determining diets in African antelopes. J. Arch. Sci. 38, 1485-1495. / Owen-Smith, N. (1979) and Dunham (1982). A total of 192 males and 188 females were sampled. Direct observations were conducted over a period of one year from April 2008 to March 2009. AFA modified according Owen-Smith (1979) and Duchman (1992). A total of 62 males and 58 females were sampled. Direct observations were made from a vehicle at distances ranging from 50 to 200 m. Mesowear analysis using slab and skull fragments of 53 individuals collected from mammified carcasses (01-2006 to 03-2008), mesowear analysis according to Fortelius & Solounias (2000). Hierarchical cluster analysis (complete linkage/furthest neighbours) as well as Mann-Whitney Rank Sum tests (MWR), and Pearson r-tests (P) calculated using SYSTAT 11.0 (SYSTAT Software Inc., Richmond, CA).

**5. Methods**

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**6. References**


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**7. References**


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