Dietary Selectivity and Degree of Grazing in Atlas Deer (Cervus elaphus barbarus)

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Abstract : Based on evidence of species depletion and palatability, previous studies of the diet of Atlas deer (Cervus elaphus barbarus) in semi-captivity in the Tazekka National Park (TNP) revealed that there is an imbalance between the natural resources of the environment and the number of deers, an imbalance translated by a degree of overgrazing of about 17.14%. In TNP enclosure, the specific issues related to deer are: (1) the suspicion of insufficient food resources that would cause an imbalance between these forage resources and the deer population and (2) the supposed spatial inadequacy of the enclosure (area = 534.79 ha) with the population size of this herbivore. The objectives of this study, conducted in the Bab Klati Reserve of TNP during fall 2016 and winter 2017, were: (i) the estimation of the abundance, in the environment, of the consumed species, to highlight its effect on deer food selectivity; (ii) the evaluation of the effect of the degree of grazing on the environment, to confirm or disprove the existence of an imbalance between natural resources and deer population and of an inadequacy of the enclosure area; and (iii) the assessment of the necessity of a food supplement. The average relative abundance of species in the diet of Atlas deer (ri) was determined in 2014 - 2015 for the 4 seasons. During the fall 2016 and winter 2017, the average relative abundance of species in the environment (pi) was calculated for 21 plots. A logarithmic transformation were applied to the fall and winter mean ri and pi of each plant species. After testing the conditions of parametric tests, the Kruskal-Wallis test was used to investigate the differences between these mean ri and/or pi within each season and between seasons. The Vanderploeg and Scavia selectivity index (Ei*) was used to assess the levels of species preference consumed by deer. In autumn, Cytisus triflorus lead deer food preferences (Ei* = 0.71), followed by Ulex boivinii (Ei* = 0.22), then Poaceae (Ei* = -0.05) and finally Lavandula stoechas (Ei* = -0.56). In winter, Lavandula stoechas and Cytisus triflorus were at the top level of the deer food preferences (Ei* = 0.45 and Ei* = 0.44 respectively); they were followed by Ulex boivinii (Ei* = 0.18), Poaceae (Ei* = 0.04) and finally Pteridium aquilinum (Ei* = -0.44). The difference in food selectivity observed in deer is thought to be due to (i) the composition of each plant and of oak acorns, (ii) the specific food requirements of this herbivore during each season, and (iii) the food supplementation. The grazing rate in TNP was positive (44%), indicating that the deer reserve can accommodate a maximum load of about 144 deer. In the reserve, the present deer stocking (estimated at 100 deer) would be in balance with both the natural resources and the enclosure area. The supplementation does not seem to be necessary.

Keywords : cervus elaphus barbarus, diet, food selectivity index (Ei*), grazing, stocking, tazekka national park

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