



جامعة الملك سعود
كلية الزراعة
قسم الإنتاج النباتي

التغيرات الموسمية في القيمة الغذائية لبعض نباتات المراعي في
منطقة الرياض

Seasonal Variations in Nutritional Value of Some Range Plant Species in the Riyadh Area

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SUMMARY

Perennial shrubs and shrublets are major components of rangelands in central region Saudi Arabia that provide forage for livestock. No work has been conducted on seasonal variations in nutritional value of the important range plants in the Riyadh area. Such information as well as information on forage quantity are essential for sustainable use of rangelands and providing available forage supplements for livestock in times when they are needed.

The objectives of this work were to: (1) study the vegetation characteristics of study area, (2) study the seasonal variations in nutritional value of *Haloxylon salicornicum* (Moq.) Bge., *Lasiurus scindicus* Henr., *Rhanterium epapposum* Oliv. and *Stipagrostis obtusa* (Del) Nees. and (3) compare the overall nutritional value of the four mentioned species.

The study site was located at the Thumamah National Park (25° 11.8 N, 46° 38.2\ E) about 80 km northeast Riyadh.

Vegetation description included a general survey of plant species in the park and measurements of some quantitative attributes of vegetation (percentage cover, frequency and density). Physical and chemical characteristics of soil were studied in forty points in the park. The study of seasonal variation in nutritional value of plant species included the analysis of acid detergent fiber (ADF), crude protein (CP), Ash, ether extract (EE), calcium (Ca) and phosphorus (P). Other nutritional analyses were conducted during the active growth and dormant periods only. Data were analyzed statistically as follows: (1) Cluster analysis was used for vegetation description and characterization. (2) Analysis of variance as a randomized complete block design (RCBD) was used to determine differences in nutritional value between species. Seasonal changes in nutritional value for each species were analyzed for variance as a completely randomized design.

Results indicated that vegetation can be grouped into four communities: *Haloxylon salicornicum* community, *Panicum turgidum* community, *Lasiurus scindicus* community and sand dune vegetation community. Besides, there were bare and semi-bare ground areas. The vegetation was generally low in coverage and diversity.

Significant seasonal variations were observed in *H. salicornicum* content of CP, P and Ash. CP was highest in fall and lowest in spring. P was highest in summer and lowest in winter. While highest and lowest level of Ash was attained in winter and fall respectively. Other studied nutritional constituents did not vary significantly.

For *R. epapposum*, results indicated significant changes in all measured nutrient values except EE and P. CP was highest in spring and lowest in fall season. ADF was highest in fall and lowest in winter. Ash content was highest in spring and lowest in summer season. P reached highest level in spring and lowest in fall season.

Significant variations occurred in nutrient values of *L. scindicus* except P. CP was highest in spring and lowest in fall season. ADF was highest in summer and reached lowest level in spring season. Total Ash reached highest value in fall and lowest value in spring time. Calcium content was highest in summer and lowest in fall season. EE was high in spring and reached its lowest level in winter.

S. obtusa was the least among species in seasonal changes of nutritive value. Only ADF changed significantly with season. Highest and lowest values of ADF were attained during summer and winter respectively.

In an attempt to relate changes in nutritive value to changes in environmental factors, simple correlation was made between nutrients and mean temperature and soil moisture at 0-30 cm and 30-60 cm depth. Results revealed significant and positive correlation between changes in soil moisture (at 30-60 cm depth) and changes in most of studied nutritive values in *H. salicornicum* and *R. epapposum*. In *L. scindicus*, changes in most nutritive values were significantly correlated with mean temperature and soil moisture at both depths. In *S. obtusa*, changes in nutritive value were more correlated with mean temperature than with soil moisture.

When all four species were compared for nutritive value, *H. salicornicum* was found the least in ADF content while *L. scindicus* contained the highest level of ADF. CP was highest in *R. epapposum* and lowest in *L. scindicus*. *H. salicornicum* contained the highest amount of Ash while *R. epapposum* contained the least level of Ash. EE was highest in *R. epapposum* and lowest in *S. obtusa*. However, *S. obtusa* contained the highest level of P while *H. salicornicum* contained the least. *H. salicornicum* was the highest in Ca content while *L. scindicus* contained the lowest amount of Ca.