

بسم الله الرحمن الرحيم

Sudan University of Science and Technology

College of Graduate Studies

**Effect of Dietary Gudaim (*Growia tenax*) on degradation, *in vitro*
gas production and nutritional Ecology**

of Rumen

**اثر الوجبات الغذائية المحتوية على القضم في خصائص التكرس ونتاج الغاز
معمليا والبيئة الغذائية للكرش**

By

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(B.Sc. (Honors') Animal production (2003

University of Gezira

**A thesis Submitted in Fulfillment for the Requirement of the Degree
of Master of Science (M.Sc.) in Nutritional Physiology**

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April 2015

Dedication

To My Parents

My Wife

My Children

My Brothers

My sisters

And My Friends

Ibrahim

Acknowledgments

Praise in the first place is to Almighty Allah, who gave me health and aptitude to complete this work.

I am deeply indebted to my supervisor Dr. Shams Eldein Hassaballa Ahmed for his guidance, advice, encouragement, and considerable help through out the execution and writing of this study.

I wish to express my sincere thanks and gratitude to my co- supervisor Prof. Shadia Abdaatti for her helpful suggestion, and continuous support out this work. My thanks extend to Animal Nutrition laboratory staff, University of Khartoum. Also I would like to thanks all staff members of the Department of Biomedical Science, College of Veterinary Medicine. Sudan University of Science and Technology for their assistance. Finally, many thanks are extended to all people who contributed in advice or support, and help me in one way or another to finish this work successfully.

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ABSTRACT

The objectives of this study were to assess the nutritive values of leaves , green shoots , fruits , and seed mash of *Grewia tenax*, and then to determine ruminal in situ disappearance kinetics of (DM) and crude protein (CP). More ever is addition to estimate the effect of different level

of *G.tenax* in steer meals on the rumen environment. This study was carried out at the Experimental Farm of the College of Veterinary Medicine and Animal Production, Sudan University of Science and Technology at *Hillat Kuku*.

Grewia tenax (leaves, green shoots, flash fruits, and seeds) collected from Kordofan and Darfur states during October 2010- 2011, were evaluated for ruminal DM, and CP, Duplicate Dacron bags were incubated for 0, 3, 6, 12, 24, 48, 72 and 96hrs in three steers fitted with ruminal cannulas over eight experimental periods. In addition estimate the effect of different level of *G.tenax* fruits on the rumen environment.

The leaves showed a significantly higher ($p<0.05$) highest crude protein (23.33%), and the lowest content was found in the seed (8.58%), the highest value of nitrogen free extract were recorded in seed (46.08%), but the lowest were founded in green shoots (21.53%). the green shoots had the highest dry matter (98.97%) while the fruits had lowest value of dry matter (91.04%) but it have highest content of Ash (18.79%).

In this study gas production after 48hrs incubation time ranged between 7.5ml/200mg DM in leaves and 19.5ml/200mg DM in the fruits ,*Grewia tenax* green shoots had a significantly higher ($p<0.05$) gas production from rapid soluble fraction (a) (4.15), than the seeds (0.03) . The results revealed that, extensive differences in ruminal degradation existed significantly ($P<0.05$) among the different tree parts. The highest degradation rate was showed in the fruits at all incubation time and the lowest degradation rates were observed in the seeds, through all the incubation periods.

The dry matter effective of the leaves , green shoots , fruits ,and seed mash of *Grewia tenax* was found different potential degradability and

significantly ($P<0.05$) differed between all parts. The leaves and fruits exhibited the highest potential degradability and significantly ($P<0.05$) differed from the seeds. The soluble fraction (a), (c) rate had varied significantly among the different tree parts. The insoluble rumen degradable fraction (b) was varied significantly among the all different parts of the *Grewia tenax*. The effective degradability at different flow rate (0.02, 0.05 and 0.08) varied significantly among the different tree parts. The highest effective degradability was in the fruits and the lowest was in the seeds.

Organic matter digestibility range was (43.57%-54.39%), Metabolisable energy was found to be 4.89Mj/kg DM in seed mash and 5.95Mj/kg MD in leaves.

Addition different levels of *Grewia tenax* to ration of rumen did not affected in rumen environment.

ملخص الدراسة

اجريت هذه الدراسة في جامعة السودان للعلوم والتكنولوجيا - كلية الطب البيطري والانتاج الحيواني . استخدمت فيها ثلاث عجول مخصية لتقييم القيمة الغذائية ومقارنة النواحي الفسيولوجية لهضم الاجزاء المختلفة من شجرة القضيم (الاوراق , الفروع الغضة , الثمار, البذور) كما تم تقييم الاثر الفسيولوجي علي بيئة الكرش ,

حيث تم جمع العينات من ولايتي جنوب كردفان وشمال دارفور في اكتوبر 2010-2011.

وجد ان الاوراق تحتوي علي نسبة عالية من البروتين الخام 23.33% مقارنة بالبذور تحتوي علي نسبة منخفضة منها 8.58% , كما ان الفروع الغضة تحتوي علي نسبة عالية من المادة الجافة 98.97% والالياف 43.42% بينما يرتفع نسبة الرماد في الثمار 18,79%, والبذور تحوي نسبة مرتفعة من المستخلص الخالي من النيتروجين 46,08%.

وقد كان إنتاج الغاز معمليا بعد مرور 48 ساعة من التحضين يتراوح ما بين 7.5مل/200جم مادة جافة في الاوراق و 19.5مل/200جم مادة جافة في الثمار والتي ترتفع عندها نسبة الغاز المنتج في الاجزاء سريعة التحلل عنه في الفروع الغضة والبذور . وان الفروع الغضة أعلى بشكل ملحوظ ($P < 0.05$) إنتاج الغاز من جزء قابل للذوبان السريع (أ) (4.15)، من البذور (0.03). وكشفت النتائج ايضا أن الاختلافات واسعة في معدل التكسر في الكرش موجودة بشكل كبير ($P < 0.05$) بين أجزاء الشجرة المختلفة. وقد أظهرت أعلى معدل تكسر في الثمار في كل اوقت الحضانة كما لوحظ ان أدنى معدل تكسر كان في البذور، من خلال جميع فترات الحضانة.

وقد كانت المادة الجافة فعالة في مختلف اجزاء النبات وتختلف بشكل كبير في معدل بين جميع الاجزاء .الاوراق والثمار اظهرت اعلي نسبة تحلل ($P < 0.05$) التحلل محتمل وتختلف بشكل ملحوظ عن البذور . وان معدل التكسر القابل للذوبان (أ) و(ج) قد تتفاوت بشكل ملحوظ بين جميع اجزاء النبات . وايضا تباينت نسبة التكسر في الكرش وغير القابلة للذوبان (ب) الي حد كبير بين جميع اجزاء نبات القضم . كما ان فعالية التحلل في معدلات التدفق المختلفة (0,02 . 0,05 . 0,08) تختلف اختلافا كبيرا بين الاجزاء المختلفة وكانت اعلي فعالية تحلل في الثمار بينما ادني نسبة سجلت في البذور.

نسبة المادة العضوية المهضومة وجدت انها تتراوح ما بين 43.57%- 54.39% . والطاقة الايضية ما بين 4.89 – 5.95 ميغاجول/كجم مادة جافة .

في هذه الدراسة وجد انه عند اضافة مستويات مختلفة من ثمار القضم كمصدر للبروتين لم يظهر تأثير معنوي او فسيولوجي علي بيئة الكرش.