

DOCUMENTING NORMAL MICROFLORA IN THRYNOMYNS SWINDERANUS MOHAMMED YARO¹, PHYLLIS ADDO², ANNA REYNOLDS BARNES³ ¹Biotechnology and Nuclear Agriculture Research Institute, ²Noguchi Memorial Institute for Medical Research, ³Department of Animal Science, University of Ghana

The Problem

ABSTRACT

•Grasscutter meat widely is recognized as a source of animal protein in Ghana.

 High mortality(of variable causes) seems to be the bane of grasscutter domestication.

 This work sought to document the normal microflora of the grasscutter GIT.

faecal •Fresh samples collected anaerobically from 36 healthy grasscutters over a six month period.

INTRODUCTION

OBJECTIVES OF STUDY

RESULTS AND DISCUSSIONS

)	Grasscutter is one of the giant rodents of	•To characterize the cultivable normal microflora of the	COMPARATIVE MICROFLORAL COMPOSITIONS OF THE 4 AGE CATEGORIES OF GRASSCUTTER				
		gastrointestinal tract of the grasscutter.		neonates	weanlings	subadults	adults
r	•Scientifically called <i>Thrynomys</i>	•To study the influence of sex on the normal microflora	<u>AEROBES</u>	E. coli	E. coli	E. coli	E. coli
	swinderianus.	of the gastrointestinal tract of grasscutter.	Kleb. spp	Kleb. spp	Kleb. spp	Kleb. spp	
e	Polonge to mommolion order Podentia	•To study the influence of age on the normal microflora of the GIT of the grasscutter		B. spp	B. spp	B. spp	B. spp
r	Belongs to manimalian order Addentia.			B. cereus	B. cereus	B. cereus	B. cereus
	• It is a relative of the guinea pig and the	ea pig and the		Staph. spp	Staph. Spp	Staph. Spp	Staph. spp
ł	porcupine but looks like a giant guinea pig	• Ultimately, this study sought to delineate the		ND	Ente. Spp	Ente. Spp	Ente. spp
1	with a tail (Adu <i>etal.</i> ,2000).	cultivable GIT normal microflora of neonate, weanling,		Calhicans			

•The normal GIT microflora isolated in the grasscutters within one month old were similar in composition.

• Unexpectedly, Candida albicans grew profusely on both aerobic and anaerobic cultures throughout the one month life of the neonates.

• For the weanlings, subadults and adults, GIT microflora had similar composition as that of the neonates but also had in addition, *Enterobacter* species from the aerobic cultures and Corynebacteria and species Clostridium perfringens from the anaerobic cultures.

significantly (p 0.01) • Age < influenced the populations of all aerobic GIT cultivable normal identified microflora except Staphylococcus species.

•A herbivorous rodent that occurs only in Africa.

•As an emerging herbivorous meat animal, the knowledge of intestinal microflora may provide clues •Inhabits the grasslands and wooded for the formulation and use of the appropriate savannas throughout the humid and the probiotics and prebiotics to enhance feed conversion sub-humid areas south of the Sahara, efficiency, thereby, increasing productivity of the especially from Senegal in the north-west, animals. stretching down to parts of Cape Province in South Africa (Adu *et al.*, 2000).

 Domesticated as mini livestock for meat production with its meat sold either as fresh (whole undressed) carcasses, or dressed and smoked (Barnes, 1994).

• A large market for the meat in the West African sub region (Asibey, 1974).

•The advocacy for domestication of grasscutter becomes stronger as accepts indoor housing with about 90% of animals acclimatizing to domestic housing within three months (Asibey & Addo (2000).

MATERIALS AND METHODS

•36 healthy grasscutters from farmers within the Coastal Savannah vegetation zone of Ghana were sampled.

•All grasscutters divided into four age categories.

•1-4week olds •2-3 month olds •4-5 month olds •6-12 month olds

subadult, and adult grasscutters.

C. albicans ND ND ND

ANAEROBES

Pep. Spp	Pep. Spp	Pep. Spp	Pep. spp
C. Albicans	C. Albicans	C. Albicans	C. albicans
Bact. Spp	Bact. Spp	Bact. Spp	Bact. spp
ND	Cl. Spp	Cl. Spp	Cl. spp
ND	Coryne.	Coryne.	Coryne.

Figure 2: The GIT microflora pop for 3 age categories (normal logs)

•Bacillus cereus isolation particularly of significance as it is a documented causative organism of food poisoning in humans and has not been reported in any normal microflora study reviewed.

 In captivity, 89% conception, 88% deliveries and 90% weaning rate reported (Addo et al., 1999).

• Wide acceptability of the meat among Ghanaians, regardless of their religious faith and social status further underscores the importance of domesticating this animal.

 Local meat production in Ghana falls short of demand.

•Due to the insatiable demand for the grasscutter meat, some people have resorted to using poisons as baits to catch wild grasscutters and this poses a serious health threat.

•The GIT was chosen because it is the most heavily colonized region of the animal.

•GIT normal microflora constitute 50% of faeces by dry weight.

•GIT normal microflora provides a general

• Study conducted at the Animal Experimentation Dept of Noguchi Memorial Institute for Medical Research.

•The room temperature throughout experimental period range from 24°C to 25°C, humidity range of between 52% and 60%, and 12 hours of alternate light and darkness. Standard feed and water were provided ad libitum.

•Faecal sampling of the grasscutters was done in the Non-infectious Experimentation Laboratory.

•All microbiological analyses were performed in the Infectious Experimentation Laboratory, a Biosafety level 2 Facility.

• Panicum maximum, cassava tubers, sugar cane and palm fruit.

• All feed were provided in fresh form ad libitum.

•A Range of specific dehydrated microbiological media and broths of good microbiological quality were used in microbial culturing.

•The media and broths were first reconstituted and sterilized according to their respective manufacturer's instructions.







non-specific defence against infections.

• In Ghana portions of the unpelleted faeces in the grasscutter GIT considered a delicacy (Adu & Wallace, 2004).

Conclusion and Inference

• The age of grasscutter unlike it's sex significantly influence quality and quantity of GIT microflora.

• Bacillus cereus! presence calls for cooking of meat properly before consumption.

• Given the vast diversity and complexity of the GIT normal microflora molecular biotechnology be use as well in future studies.

• These findings provides valuable research inputs: microbial diseases, use of probiotics and prebiotics.

for the Grasscutter farming *Neccesary (Micro Livestock) to bring about the desired impact.



Figure 1: Improvised anaerobic glove box using a vinyl isolator