

Bill Buttemer

# ANZSCP 2004

## PROCEEDINGS

*Australian & New Zealand Society for Comparative Physiology & Biochemistry  
21st Annual Meeting Dec 9-12 University of Wollongong*

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**ANZSCPb Proceedings**

**21st Annual Meeting, December 1-12, 2004**

**University of Wollongong, Wollongong NSW 2522**

**organised by W.A. Buttemer, P.L. Else, A.J. Hulbert, S.C. Faulks, N. Turner**

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# Program

## Thursday 9th December

5.00-7.00pm registration foyer of Building 67 (McKinnon Building)

## Friday 10th December

9.00 am	chair	registration and coffee/tea	Talks (in lecture theatre 67.104)
10.30	Paul Else	<b>Welcome and Introduction</b>	
10.40		<u>Alexander Kabat</u> and R. Swain	The metabolic costs of pregnancy in <i>Niveoscincus microlepidotus</i>
11.00		John E. Nelson and <u>Robert T. Gemmell</u>	The temperature gradient from the urogenital sinus to the pouch in the pregnant marsupial quoll, <i>Dayurus hallucatus</i>
11.20		<u>Roger Lentle</u>	Reactor theory meets rheometry: a test of chemical reactor based models of digestion using gastric and small intestinal digesta from two marsupial
11.40		<u>Stuart M Linton</u> , Peter Greenaway and David Towle	Endogenous production of cellulases by the Gecarcinid land crabs <i>Gecarcoldea natalis</i> and <i>Discoplax hirtipes</i>
12.00		LUNCH	
1.20	Sam Richardson	<u>Ferry O'Dwyer</u> , W.A. Buttemer and D.M. Priddel	Relationships between parental body condition and prolactin during breeding in Gould's petrels, <i>Pterodroma leucoptera</i>
1.40		<u>Harry Battam</u> , C. Robertson and W.A. Buttemer	Dimensions and scaling of locomotor muscles of the petrels ( <i>Procellariiformes</i> )
2.00		<u>Kea N. Webster</u> and T.J. Dawson	Organ sizes and metabolic performance of marsupials
2.20		<u>Yvonne Ingen-Housz</u>	The effect of incubation temperature on hatching attributes of the freshwater turtle <i>Elseya</i> sp. from the Burnett River
2.40		<u>Elektra Sinclair</u>	Thermal acclimation in the limpet <i>Cellana tremoserica</i>
3.00		COFFEE/TEA	
3.40	Nigel Turner	A. Barber and <u>Philip Withers</u>	Ocular water loss in skinks and geckos
4.00		<u>Christine Cooper</u> , F. Geiser and B. McAllan	The effect of daily torpor on the water economy of an arid-zone marsupial, the stripe-faced dunnart
4.20		<u>Nereda Christian</u> and Fritz Geiser	Is frequency of torpor in sugar gliders ( <i>Petaurus breviceps</i> ) due to winter food shortages or restrictions to foraging?
4.40		<u>Terence J. Dawson</u> and Cyntina E. Blaney	The effects of dehydration on the thermal biology of kangaroos - differences between lab and field responses.
5.00		POSTERS	
		<u>Rachel C. Aland</u> and Sophie Baron	Histology and ultrastructure of the prostate gland of <i>Antechinus subtropicus</i>
		<u>Niels A. Andersen</u> , Christina Vedel-Smith and Stewart Nicol	Circadian and circannual patterns of body temperature and activity in the Tasmanian echidna ( <i>Tachyglossus aculeatus</i> )
		<u>Jessica Gregg</u>	Are small and large dogs different in body and membrane composition?
		Susan M. Jones, <u>Ashley Edwards</u> and Joan Whittier	Effects of environmental stress on alpine skinks in Tasmania - an Earthwatch-funded project
		<u>Susan M. Jones</u> and Ashley Edwards	Which endocrine factors influence reproductive decisions in the multiannually breeding viviparous lizard, <i>Tiliqua nigrolutea</i>
		<u>Bronwyn McAllan</u> , Steven Hobbs & David O. Norris	Presence of neurofibrillary alterations and beta-amyloid immunoreactivity in the brain of a marsupial, <i>Antechinus stuartii</i>
		<u>Michael Usher</u>	Diet, lipids and lifespan of the blowfly ( <i>Calliphora stygia</i> )
		Lisa M. Walter, Peter A.W. Rogers, and <u>Jane E. Girling</u>	Progesterone is angiogenic and oestrogen is anti-angiogenic in mouse endometrium
		Jill C. Weakley and <u>Susan L. Edwards</u>	Molecular and Immunohistochemical identification of a putative sodium proton exchanger isoform in the gills of euryhaline barramundi ( <i>Lates calcarifer</i> )
		<u>Kerry W Withers</u> and J. Billingsley	Application of machine vision to determine the density of dingo teeth
6.15		SIZZLING SOCIAL held in sports lounge in Sports & Recreation Centre (bldg 13)	

chair	Program	Saturday 11th December
9.00 Terry Dawson	<u>Carly Woodd</u> and WJ Sturrock	Reproductive indicators and fecal steroid analysis in the captive squirrel glider ( <i>Petaurus norfolcensis</i> )
9.20	<u>Christopher Turbill</u> , Gerhard Kortner, Fritz Geiser	Daily temperature cycles affect energy expenditure and arousal from torpor in a small, tree-roosting bat ( <i>Nyctophilus geoffroyi</i> )
9.40	<u>Beth L. Symonds</u> , Nicholas J. Hudson and Craig E. Franklin	Effect of aestivation on muscle fibre morphology in the Green-striped burrowing frog ( <i>Cyclorana alboguttata</i> )
10.00	<u>Rebecca L. Cramp</u> and Craig E. Franklin	The effect of aestivation on digestive efficiency of emergent Green-striped burrowing frogs
10.20	COFFEE/TEA	
11.00 Bronwyn McAllan	<u>Natalie Mathie</u> , Craig Franklin, Colin Limpus	The influence of body size on the diving behaviour and physiology of the bimodally respiring turtle <i>Elseya</i> sp. Nov.
11.20	<u>Lesley A. Alton</u>	Effects of aerial oxygen content and barometric pressure on biomodal gas exchange and air breathing behaviour in <i>Trichogaster leeri</i>
11.40	<u>Philip Matthews</u>	Compressible gas gills: Comparing theory with empirical data
12.00	<u>Roger S. Seymour</u> and Craig R. White	Models for embryonic respiration
12.20	LUNCH	
2.00 Sue Jones	<u>Samantha Richardson</u> , J.A. Monk, C.A. Sheperdley, L.O.E. Ebbesson, F. Sin, D.M. Power, P.B. Frappell, J. Kohrle & M. B.	Developmentally regulated thyroid hormone distributor proteins in marsupials, a reptile and fishes
2.20	<u>Sarah Hennebury</u> , H.M. Wright and S.J. Richardson	The transthyretin-like proteins of non-vertebrates
2.40	<u>Geoff Carey</u> and Craig E. Franklin	The effect of early temperature on muscle growth and development in barramundi ( <i>Lates calcarifer</i> )
3.00	<u>David T. Booth</u> , Kirsty Kiddell	The effect of temperature on the energetics of development in House crickets
3.20	COFFEE/TEA	
4.00 Bill Buttemer	<u>Nigel Turner</u> , T. Starke-Peterkovic, P.L. Else and R.J.	Electric field strength of membrane lipids from vertebrate species: Relationship with membrane lipid composition and Na <sup>+</sup> ,K <sup>+</sup> -ATPase molecular activity
4.20	<u>Paul L. Else</u> , T. W. Mitchell, N. Turner, S. Faulks and A. J. Hulbert	Membrane lipids – "regulators" or "conformers" to dietary lipid profile?
4.40	general meeting	
6.20	<u>Peter Frappell</u>	Russ Baudinette in memoriam buses leave University & International House for conference dinner at Austinmer Surf Club
<b>Sunday 12th December</b>		
9.00 Fritz Geiser	<u>Timothy Clark</u> , Peter B. Frappell and Patrick J. Butler	The effect of temperature during periods of increased metabolism in a varanid lizard
9.20	<u>Catriona Condon</u> and Robbie Wilson	The influence of thermal acclimation on the reproductive behaviour and swimming performance of female eastern mosquitofish ( <i>Gambusia</i> )
9.40	<u>Amanda C Niehaus</u> , Robbie S Wilson, Craig E Franklin	Thermal instability and the development and metamorphic condition of striped marsh frogs ( <i>Limnodynastes peronii</i> )
10.00	<u>Kris Rogers</u> , Mike Thompson, Frank Seebacher	Biochemical acclimation of metabolism in <i>Limnodynastes peronii</i>
10.20	COFFEE/TEA	
11.00 Tony Hulbert	<u>Frank Seebacher</u> , Cara Lowe, Bill Davison and Craig Franklin	A falsification of the thermal specialization paradigm: compensation for elevated temperatures in Antarctic fish, I. Swimming performance
11.20	<u>Craig Franklin</u> , Bill Davison, Frank Seebacher	A falsification of the thermal specialisation paradigm: compensation to elevated temperatures in Antarctic fish II. Cardiac function
11.40	<u>Robbie R. Wilson</u> and Ian A. Johnston	Testing the benefits of thermal acclimation to the sneaky-mating performance of male eastern mosquitofish
12.00	<u>Craig K. R. Willis</u> and R. Mark Brigham	Thermal physiology as a means to assess habitat preferences in free-ranging, North American microbats
12.20	Awarding of Prizes and Closing of Conference	
	LUNCH	

## **Application of machine vision to determine the density of Dingo teeth**

Kerry. W. Withers<sup>1\*</sup> and J. Billingsley<sup>2</sup>

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To devise effective management strategies for animals in the wild and to examine their ecology, it is often useful to determine their age. For determining of the age of dingoes, methods are usually associated with measurements of the diameter of tooth pulp cavity. However, this approach is complicated in animals older than two years by closure of this cavity. Tooth density has recently been examined as a means of aging dingoes (Ellerton et al: in prep). To avoid the need for immersion of the porous tooth to use the Archimedes method, we present a method to determine tooth density through the application of machine vision technology.

A canine tooth removed from a dingo skull of known age was mounted on a rotating vertical shaft, driven by a stepper motor controlled by a computer. Using a web camera, the computer can capture images of the tooth against a black background as the tooth rotates about the vertical axis. Active-X software was developed for analyzing images using some principles common to those used in tomography. Analysis using the green component of the image data resulted in a clear black and white silhouette of the tooth. Fifty images were captured per rotation of the tooth. These were used to compute volumes of 320 notional slices to calculate tooth volume in cubic pixels. Calibration of the system with a marble of known diameter enabled tooth volume to be expressed in mm<sup>3</sup>. Tooth density was calculated by dividing tooth mass by tooth volume.