Daniel **Moreira**

Researcher

Faculty of Medicine, University of Brasilia

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I am a researcher and data scientist in the life sciences with 10+ years experience in redox biology.

Education

PhD in Biochemistry and Molecular Biology

Brasilia, Brazil

Department of Cell Biology, Institute of Biological Sciences, University of Brasilia

Mar, 2014 - Nov, 2017

- Academic degree recognized by the Portuguese Directorate General for Higher Education (DGES)

MSc in Biochemistry and Molecular Biology

Brasilia, Brazil

Department of Cell Biology, Institute of Biological Sciences,University of Brasilia

Mar, 2012 - Feb, 2014

- Academic degree recognized by the Portuguese Directorate General for Higher Education (DGES)

BSc in Biological Sciences

Brasilia, Brazil

Institute of Biological Sciences, University of Brasilia

Mar, 2008 - Dec, 2011

Research Experience and Appointments

Molecular and Analytical Medicine Laboratory, Department of Biomedicine, Faculty of Medicine (FMUP), University of Porto

Porto, Portugal

Visiting Postdoctoral Fellow - Biosensing technologies for advanced and quantitative molecular profiling

Feb, 2023 - Feb, 2024

- Developed an R workflow to automatically extract and analyze data from screen-printed electrodes used as biosensors.
- Developed and employed biosensor-based immunoassays for different sample types (e.g., serum, cerebrospinal fluid) from patients.
- Conducted conventional immunoassays (e.g., ELISA) with clinical samples.

Glial Cell Biology Group, Institute for Research & Innovation in Health (i3S), University of Porto

Porto, Portugal

Postdoc Researcher with external funding - PEP-GLIA - Characterization of the mechanism of action of an antioxidant peptide with neuroprotective potential from the Brazilian biodiversity

Feb, 2023 - Feb, 2024

- FRET-based imaging and live-cell imaging.
- Operated motorized inverted epifluorescence microscope (Leica DMI6000 FFW).

Cancer Cell Biology Research Group, Department of Pathology and Experimental Therapeutics, University of Barcelona

Barcelona, Spain

Visiting Researcher - Development of new technologies to reduce the incidence of global diseases

Mar, 2020 - Apr, 2020

- Assessed the cytotoxicity of synthetic peptides towards several cancer cell lines using cell viability assays.

Department of Cell Biology, Institute of Biological Sciences, University of Brasilia

Brasilia, Brazil

PhD Student - Redox Metabolism Adaptations to Extreme Environments: Mechanism, Distribution and Occurrence of the "Preparation for Oxidative Stress" Phenomenon

Mar, 2014 - Nov, 2017

- Worked directly in the redefinition of the theory of Preparation for Oxidative Stress.
- Established criteria and mapped (for the first time) the occurrence of Preparation for Oxidative Stress in the animal kingdom.
- Implemented and optimized a method to assess protein glutathionylation.
- Coordinated field expeditions to collect frogs in the Brazilian semi-arid region.

Department of Cell Biology, Institute of Biological Sciences, University of Brasilia

Brasilia, Brazil

MSc Student - Free Radical Metabolism during Diapause in the Sunflower Caterpillar (Chlosyne lacinia)

Mar, 2012 - Feb, 2014

- Used molecular biology techniques to obtain partial sequences of genes coding antioxidant proteins from a species with no genomic data.
- Insect colony care and maintenance.
- Coordinated field expeditions to collect insects.

Institute of Biological Sciences, University of Brasilia

Brasilia, Brazil

BS Undergrad - Antioxidant responses to anoxia and reoxygenation in gastropods and to blood-feeding in vampire bats.

Mar, 2008 - Dec, 2011

- Applied pharmacological strategies to inhibit antioxidants and investigate their roles in vivo.
- Animal care and maintenance (snails and bats).

Professional Experience

Faculty of Medicine, University of Brasilia

Brasilia, Brazil

Researcher in Biology

Nov, 2016 - Present

- Designed, executed and supervised a variety of scientific experiments.
- Implemented, optimized and validated HPLC protocols for the analysis of small molecules.
- Responsible for the operation and maintenance of HPLC instruments.
- Delivered training to graduate students in the Medical Sciences Graduate Program.
- Secured grant funding for research and outreach activities.
- Mentored students in undergraduate research projects and co-supervised graduate students.
- Authored +30 peer-reviewed research articles in indexed international scientific journals.
- Invented the RGBradford, a method to measure protein concentrations from pictures taken with a smartphone.
- Member of the organizing/scientific committee of three editions of international scientific meetings on Health Innovation.

Self Employed

Remote

Freelance Editor and Writer in the Life Sciences

Feb, 2020 - Feb, 2021

- Created visually appealing and technically accurate data visualization elements (figures and tables).
- Wrote passages to ensure clarity and flow in research papers and technical documents.
- Reduced the number of words without loss of content to adhere to guidelines.
- Corrected any error in spelling, grammar and word choice in manuscripts.
- Perfect rating (5 stars out of 5) from clients in the Peerwith platform.

Cactus Communications

Remote

Editor in the Life Sciences (Remote Contractor Position)

Dec, 2018 - Jan, 2020

- Strictly adhered to non-disclosure and confidentiality guidelines on confidential information.
- Interacted with clients/authors to ensure that their intended meaning was maintained after editing.
- Edited research manuscripts (60,000 words per month) such that the final text was in standard scientific English, free of unclear or unidiomatic sentences.
- Collaborated with other editors to give and receive feedback on editing jobs.

Selected Presentations

The Fifth International Congress of Serbian Society for Mitochondrial and Free Radical Physiology

Belgrade, Serbia

Preparation for oxidative stress: History, recent advances and future directions

2024

- Keynote speaker.

How Global South Research Can Shape the Future of Comparative Physiology Workshop

Kruger National Park, South Africa

Galleria mellonella as a Model for Comparative Biochemistry and Physiology

2024

- Oral presentation.

10th International Congress of Comparative Physiology and Biochemistry (ICCPB)

Ottawa, Canada

Is there "Preparation for Oxidative Stress" in estivating frogs under natural field conditions of the Brazilian semi-arid Caatinga?

2019

- Oral presentation.

9th International Congress of Comparative Physiology and Biochemistry (ICCPB)

Kraków, Poland

Redox balance, endogenous antioxidants and metabolic adjustments during Tropical diapause in the sunflower caterpillar Chlosyne lacinia (Lepidoptera: Nymphalidae)

2015

- Oral presentation.

Awards and Honors

Inspiration and Resilience Award — *The Biochemical Society, UK*

Awardee: Daniel Moreira — *2025*

Honorable Mention at the 29º Congresso de Iniciação Científica da UnB e 20º Congresso de Iniciação Científica do Distrito Federal — *University of Brasilia, Brazil*

Awardee: Maria Beatriz Nascimento | Supervisor: Daniel Moreira — *2023*

- Undergrad Research Project Congress

Best Poster Presentation at the II International Meeting on Innovation in Health — *II INOVATEC, Brazil*

Presenter: Ariane Nogueira | Co-author: Daniel Moreira — *2020*

Best PhD Thesis Great Award in Life Sciences — *University of Brasilia, Brazil*

Awardee: Daniel Moreira — *2018*

Best PhD Thesis Award in Biological Sciences — *University of Brasilia, Brazil*

Awardee: Daniel Moreira — *2018*

Honorable Mention for Poster Presentation at the XXVI Reunião Anual da Federação de Sociedades de Biologia Experimental — *FeSBE Annual Meeting, Brazil*

Presenter: Daniel Moreira — *2011*

- Experimental Biology National Meeting

Honorable Mention for Poster Presentation at the at the XVI Congresso de Iniciação Científica da UnB e 7º Congresso de Iniciação Científica do Distrito Federal — *University of Brasilia, Brazil*

Presenter: Daniel Moreira — *2010*

- Undergrad Research Project Congress

Best Work in Cell Biology at the XV Congresso de Iniciação Científica da UnB e 6º Congresso de Iniciação Científica do Distrito Federal — *University of Brasilia, Brazil*

Presenter: Daniel Moreira — *2009*

- Undergrad Research Project Congress

Supervision

Teaching

Certification, Licenses, and Memberships

The Biochemical Society

Member and International Ambassador — *Mar, 2024 - Present*

The Society for Experimental Biology (SEB)

Member — *Oct, 2023 - Present*

Society for Redox Biology and Medicine (SfRBM)

Member — *Jul, 2016 - Present*

European Peptide Society (EPS)

Member — *Jun, 2023 - Present*

The International Association for Biological Oceanography (IABO)

Member — *Oct, 2022 - Present*

Board of Editors in the Life Sciences (BELS)

Certified Editor in the Life Sciences — *Nov, 2020*

Board of Editors in the Life Sciences (BELS)

Member — *Nov, 2020 - Feb, 2023*

Regional Council of Biologists (CRBIO, Brazil)

Registered Biologist — *May, 2018 - Present*

Funding

Editorial and Peer Review Experience

Editorial Board

PeerJ – Life and Environment

Academic Editor — *May, 2022 - Present*

Reviewer Board

Frontiers in Physiology and Frontiers in Marine Science

Review Editor in Aquatic Physiology — *Apr, 2018 - Present*

Frontiers in Physiology

Review Editor in Redox Physiology — *Mar, 2018 - Dec, 2021*

Molecules

Reviewer Board Member — *Dec, 2020 - Present*

Special Issues

Environmental Influence in Physiological, Endocrine, and Oxidative Stress Responses of Aquatic Invertebrates

Guest Editor — *2024*

Redox Metabolism in Ecophysiology and Evolution, 2nd edition

Guest Editor — *2024*

Redox Metabolism in Ecophysiology and Evolution

Guest Editor — *2022*

The defense responses of aquatic animals to the environment

Guest Associate Editor — *2021*

Rising Stars in Aquatic Physiology: 2022

Guest Associate Editor — *2022*

Redox Metabolism in Environmental and Ecological Physiology of Animals

Guest Associate Editor — *2022*

Peer Review

I have been an active peer reviewer since 2012, building a verified record of >150 reviews for 40 different international indexed journals in the fields of redox biology, biochemistry, biotechnology, molecular biology and comparative physiology. Full peer review record in my Web of Science profile.

Organizing and Scientific Committees

Adhoc Consultancy for Funding Agencies

Examination Committee and Academic Degree Jury

References

Relevant Research Skills

Software

Wet Lab Techniques

Research Projects

Ongoing

Finalized

Science Popularization, Dissemination and Outreach Activities

Full Publication List

Book Chapters

Refereed Journal Papers

Presentations

Oral Presentations

The Fifth International Congress of Serbian Society for Mitochondrial and Free Radical Physiology — *Belgrade, Serbia*

Preparation for oxidative stress: History, recent advances and future directions — *2024*

How Global South Research Can Shape the Future of Comparative Physiology Workshop — *Kruger National Park, South Africa*

Galleria mellonella as a Model for Comparative Biochemistry and Physiology — *2024*

4th Latin American Biotechnology Symposium — *Parnaíba, Brazil*

Redox Biology and COVID-19 — *2022*

10th International Congress of Comparative Physiology and Biochemistry (ICCPB) — *Ottawa, Canada*

Is there "Preparation for Oxidative Stress" in estivating frogs under natural field conditions of the Brazilian semi-arid Caatinga? — *2019*

9th International Congress of Comparative Physiology and Biochemistry (ICCPB) — *Kraków, Poland*

Redox balance, endogenous antioxidants and metabolic adjustments during Tropical diapause in the sunflower caterpillar Chlosyne lacinia (Lepidoptera: Nymphalidae) — *2015*

14th International Hibernation Symposium — *Semmering, Austria*

Redox metabolism during tropical diapause in a Lepidoptera larva — *2012*

XXVII Annual Meeting of the Brazilian Federation of Experimental Biology Societies (FeSBE) — *Águas de Lindóia, Brazil*

Oxidative stress markers and antioxidant defenses during insect diapause — *2012*

Poster Presentations

38th World Congress of The International Union of Physiological Sciences (IUPS) — *Rio de Janeiro, Brazil*

Modulation of antioxidants and central metabolism during months-long estivation of a frog in a semi-arid environment — *2017*

VII Simpósio do Programa de Pós-Graduação em Ciências Biológicas (Biologia Molecular) — *Brasilia, Brazil*

Adaptações do Metabolismo Redox aos Extremos Ambientais: Mecanismo, Distribuição e Ocorrência do Fenômeno de Preparo para o Estresse Oxidativo — *2017*

VI Simpósio do Programa de Pós-Graduação em Ciências Biológicas (Biologia Molecular) — *Brasilia, Brazil*

Modulação de antioxidantes e do metabolismo central durante meses de estivação do anuro Proceratophrys cristiceps em um ambiente semi- árido — *2016*

V Simpósio do Programa de Pós-Graduação em Ciências Biológicas (Biologia Molecular) — *Brasilia, Brazil*

Preparo para o Estresse Oxidativo no Reino Animal — *2015*

IV Simpósio do Programa de Pós-Graduação em Ciências Biológicas (Biologia Molecular) — *Brasilia, Brazil*

Papel de Antioxidantes Endógenos como Parte do Sistema Adaptativo de um Anfíbio para Sobrevivência nas Secas da Caatinga — *2014*

III Simpósio do Programa de Pós-Graduação em Ciências Biológicas (Biologia Molecular) — *Brasilia, Brazil*

Aspectos bioquímicos da diapausa da lagarta do girassol (Chlosyne lacinia) — *2013*

First International Congress on Oxidative Stress in Aquatic Ecosystems — *Los Cabos, Mexico*

Animal responses to wild fluctuations in oxygen availability - revisiting the concept of 'preparation for oxidative stress' — *2012*

XL Annual Meeting of the Brazilian Society for Biochemistry and Molecular Biology (SBBq) — *Foz do Iguaçu, Brazil*

Free radical metabolism during diapause in a lepidopteran species — *2011*

16º Congresso de Iniciação Científica da Universidade de Brasília e 7º Congresso de Iniciação Científica do Distrito Federal *Brasilia, Brazil*

Estudo do sistema antioxidante durante a diapausa *2010*

15º Congresso de Iniciação Científica da Universidade de Brasília e 6º Congresso de Iniciação Científica do Distrito Federal *Brasilia, Brazil*

O papel da catalase na defesa antioxidante de um gastrópode durante um ciclo de anóxia e reoxigenação *2009*

XXXVIII Annual Meeting of the Brazilian Society for Biochemistry and Molecular Biology (SBBq) *Águas de Lindóia, Brazil*

The role of catalase during anoxia and reoxygenation in gastropods *2009*

Conference Abstracts

Research Visibility

Appendix A

PhD Project Abstract

Redox metabolism adaptations to extreme environments: mechanism, distribution and occurrence of the "Preparation for Oxidative Stress" phenomenon. *University of Brasilia, Brazil*

Moreira, D.C. *when*

- Evolution has selected a set of biochemical and physiological adaptations in animals that tolerate wide variations of environmental parameters. Due to its roles in energy metabolism and in reactive oxygen species (ROS) generation, fluctuations in O2 availability are potentially deleterious to animals. Extreme environments in which oxygen availability and consumption are strongly affected include events of hypoxia, anoxia, freezing, severe dehydration, aerial exposure of aquatic organisms, and estivation. The increase in endogenous antioxidants levels is a common strategy of animals submitted to such situations. This strategy was coined "Preparation for Oxidative Stress" (POS). The aim of this study was: (i) to propose a detailed molecular mechanism for the activation of POS under low oxygen stresses; (ii) to design classification criteria and classify species, determining the prevalence of POS in animals; and (iii) to verify the occurrence of POS in two anurans from the Caatinga during estivation in their natural environment. Published data indicates that POS could be activated by a surge in ROS production during hypoxia. According to this model, the rise in ROS generation would activate redox-sensitive transcription factors (Nrf2, FoxO, HIF-1 e NF-κB), leading to enhanced antioxidant defenses. The proportion of POS- positive species in the animal kingdom depends on the nature of the low oxygen stress. The prevalence of POS-positive species was 54-77%, 64-77% and 75-86% for aerial exposure, anoxia and freezing respectively. In the case of estivation and dehydration the prevalence was higher, reaching 91-100%. For hypoxia, the prevalence of POS-positive animals was 37.5-53%, depending on the criteria. The high prevalence of POS-positive species highlights the important role of antioxidant modulation during low oxygen stresses. Considering that results from field-collected animals might be more ecologically relevant than those from laboratory experiments, we investigated the modulation of antioxidants in the muscle of two anuran species from the Caatinga, Pleurodema diplolistris and Proceratophrys cristiceps, during estivation without experimental intervention. To do so, we measured the activities of metabolic and antioxidant enzymes, as well as the concentration of reduced and disulfide glutathione. In both species, the activity of citrate synthase decreased by 36% in the muscle of estivating animals collected in the dry season compared to active animals collected in the rainy season. The activities of catalase, glutathione peroxidase (total) and glutathione peroxidase (H2O2) increased in both species during estivation. In P. diplolistris, they increased by 74%, 74% and 73% respectively. While they increased by 48%, 57% and 78% respectively in P. cristiceps. Such enhanced antioxidant capacity in both species is the first report of POS occurrence in animals estivating under natural conditions.
- Keywords: antioxidant; ecophysiology; reactive oxygen species; estivation; hypoxia.

MSc Project Abstract

Free Radical Metabolism during Diapause in the Sunflower Caterpillar (Chlosyne lacinia)

University of Brasilia, Brazil

Moreira, D.C. *when*

- Animals challenged with adverse environmental conditions rely on metabolic depression is as an important adaptive response. Endogenous antioxidant defenses play important roles in different metabolic depression processes (e.g. hypoxia tolerance, freezing, hibernation, estivation and diapause). Among the situations of metabolic depression in which the redox metabolism have been addressed, diapause is one of the least studied, especially in tropical insects. The aim of this work was to identify adaptations of the redox metabolism associated to tropical diapause employing as an animal model the bordered patch Chlosyne lacinia caterpillars. The determination of antioxidant and intermediary metabolism enzymes activity and of glutathione and oxidative stress markers concentrations were conducted in whole body homogenates. Animals were collected in three different months, January and March (2010), and June (2011). Experimental groups were active animals (control), diapausing animals for 0-24 hours, 20, 40, 60 and 120 days, and post-diapause active animals. Citrate synthase (CS) activity decreased (70%) at the diapause beginning and returned to control levels at the end of diapause. The activities of the antioxidant enzymes ascorbate peroxidase, catalase and glutathione peroxidase (selenium independent) also decreased by 64%, 51% and 43% respectively at the diapause beginning and returned to control levels at the end of diapause. The activities of glutathione reductase and selenium dependent glutathione peroxidase were not detected in C. lacinia. There were significant correlations between antioxidant activities and CS activity. Glucose 6-phosphate dehydrogenase and pyruvate kinase activity remained unchanged is response to diapause. Isocitrate dehydrogenase (NADP+) activity increased at diapause beginning and remained higher than control until the 40th day of diapause. Glutathione transferase (GST) activity increased in response to diapause. In the first 24 hours of diapause GST activity increased by 370%. The concentrations of glutathione equivalents (GSH-eq), reduced glutathione (GSH) and oxidized glutathione (GSSG) decreased significantly during diapause and returned to control levels after diapause. Thus, the GSSG/GSH-eq ratio was unaltered. The levels of oxidative stress markers (TBARS and protein carbonyls) either decreased or remained constant during diapause. The results indicate decreased mitochondrial density and reduced aerobic metabolism those were already related during diapause in other species. Potentially diminished production of reactive oxygen species together with mechanisms of reduced energetic demand justify the reduction of endogenous antioxidants. Diapause beginning is accompanied by an increased potential production of NADPH, which could be used by the antioxidant system, by fatty acid synthesis and by polyol synthesis – as dehydration resistance mechanism. Increased GST activity, also observed in other diapausing insects, could play roles other than xenobiotics detoxication, including the binding and transport of biomolecules. The biological function of GST during diapause must be further investigated. The lack of evidences showing oxidative stress or redox imbalance indicates that C. lacinia presents efficient biochemical adaptation to survive the metabolic transitions occurring in the tropical diapause under low humidity.
- Keywords: reactive oxygen species; oxidative stress; antioxidants; glutathione; glutathione transferase; metabolic depression; hibernation.

Undergraduate Research Project Abstracts

The Role of Catalase during Anoxia and Reoxygenation in Gastropods

University of Brasilia, Brazil

Welker, A.F.; Moreira, D.C.; Hermes-Lima, M. *when*

- The importance of each individual antioxidant enzyme for the adaptation of hypoxic tolerant animals to cycles of anoxia and reoxygenation is not well understood. The aim of this work was to assess the role of catalase in land snails Helixaspersa during post-anoxic reoxygenation by the suppression of its activity with aminotriazole (ATZ) injection. Catalase activity in foot muscle fell 60% after ATZ administration. ATZ alone resulted in no alterations in the activity of antioxidant enzymes, GSH levels, and oxidative stress markers (OSM): TBARS, carbonyl protein and GSSG:GSH ratio. Anoxia induced a rise in foot Se-GPX activity in saline- and ATZ-injected animals (1.8-2.0 fold). This elevated Se-GPX activity rapidly returned to normal levels at the onset of reoxygenation, whereas this return to normal activity happened 60 min later in ATZ-injected animals. Reoxygenation caused no changes in OSM in foot of saline- or ATZ-injected snails. In hepatopancreas, most parameters remained unchanged in response to ATZ (which suppressed 69% of catalase activity), anoxia or reoxygenation. Anoxia caused a tendency for the increase in Se-GPX activity in both groups ($p=0.06$ for saline and $p=0.10$ for ATZ) and only punctual and small increases in carbonyl protein during reoxygenation in ATZ-injected animals. These data show that Helixaspersa present an efficient antioxidant system, since oxidative stress was not observed during reoxygenation – even in tissues with catalase suppression. This suggests that activation of Se-GPX activity during anoxia (a process unaffected by ATZ) played a key adaptive role in reoxygenation. The activation of Se-GPX is also encountered in other mollusks during hypoxia/anoxia exposure, which is associated with minor oxidative stress.
- Keywords: antioxidant; metabolism; peroxidation.

Role of Glutathione during Anoxia and Reoxygenation Stress in Terrestrial Gastropods

University of Brasilia, Brazil

Ferreira-Cravo, M.; Sabino, M.A.C.T.; Moreira, D.C.; Hermes-Lima, M. *when*

- Previous studies have shown that endogenous antioxidant defenses are relevant for the control of oxidative damage induced by anoxia-plus-reoxygenation stress in terrestrial gastropods (Welker, 2009). One of these defense mechanisms include GSH metabolism. Thus, we decided to investigate oxidative stress in Helix aspersa snails during anoxia-plus-reoxygenation after GSH depletion by means of buthionine sulfoximine (BSO) injection – an inhibitor of GSH biosynthesis. Total-GSH (GSH-eq) levels in digestive glands were reduced by 61% in BSO-injected animals. GSSG levels increased by 2-fold in BSO-injected snails during anoxia relative to normoxic snails. GSSG levels were sustained in BSO-injected snails during reoxygenation (15 min to 2 h) despite the partial depletion in GSH-eq. GSSG:GSH-eq ratio also increased (by 2-fold) in anoxia and 15 min-reoxygenation in BSO-injected animals, indicative of a more oxidized state. TBARS and carbonylated proteins were unchanged. Small changes were observed in the activities of antioxidant enzymes (catalase, GST, glutathione reductase and glutathione peroxidase) during anoxia plus reoxygenation in saline- and BSO-injected snails. These activity changes might be related to readjustments of redox metabolism under anoxia/reoxygenation. Thus, partial loss of GSH induces a condition of mild oxidative stress during the phases of oxygen depletion (prior to full anoxia) and reoxygenation. This indicates a relevant role for GSH in the gastropod resistance to anoxia-plus-reoxygenation stress.
- Keywords: anoxia; glutathione; oxidative stress.

Antioxidant Modulation in Response to Blood-feeding in Vampire Bats *University of Brasilia, Brazil*

Andrade Jr., R.; Oliveira, P.L.; Moreira, D.C.; Hermes-Lima, M. *when*

- Unique among mammals, the common vampire bat Desmodus rotundus is an obligatory blood feeder and, therefore must handle daily large quantities of ingested hemoglobin-iron. Previous data from our lab indicated that despite its potentially oxidative diet, the vampire bat presents few differences in oxidative status in liver and muscle when compared with rats and mice. In the present work we determinate the effect of a blood meal in the levels of liver and muscle TBARS and carbonyl protein (CP) as well as activities of antioxidant enzyme (Catalase, GST, GR and G6PDH) in vampire bat. We observed an increase in hepatic GST and G6PDH activities after 24h of blood ingestion. A tendency towards an increase in CP levels and towards a mild decrease in TBARS levels was observed in muscle. No changes (over 24h) were found in catalase, GR, CP and TBARS in liver, as well as GST and G6PDH activities in muscle. These results suggest an important role of liver GST and G6PDH to maintain redox status during blood digestion. Biological significance of CP and TBARS levels data in muscle remain unclear. Conceivably, fine regulation of iron metabolism may enable vampire bat to deal with an iron-enriched diet avoiding its availability for oxidative stress induction. Further studies on proteins involved in iron metabolism in gut (where iron intake is controlled) are now under way to confirm this hypothesis.
- Keywords: free radicals; common vampire bat; iron overload.