

Leon Philip Antonius Maria CLAESSENS

- Appointments:** Associate Professor of Biology, College of the Holy Cross (2011-)
Curatorial Affiliate, Peabody Museum, Yale University (2006-)
- Address:** Department of Biology
College of the Holy Cross
1 College Street
Worcester, MA 01610, U.S.A.
Telephone: (508) 793 2594
Facsimile: (508) 793 2696
lclaessee@holycross.edu
- Degrees:** B.Sc., Utrecht University, Netherlands, Geology, 1992
M.Sc., Utrecht University, Netherlands, Geology, 1996
A.M., Harvard University, U.S.A., Biology, 2002
Ph.D., Harvard University, U.S.A., Biology, June 2005
- Teaching:** ***College of the Holy Cross***
2005-
Biological Principles: Mesozoic Life (Bio 114)
Comparative Vertebrate Morphology (Bio 213)
General Biology II (Organismal Biology, Bio 121)
Vertebrate History (Bio 255)
- 1997-2005 ***Harvard University***
Teaching Fellow:
Dinosaurs and Their Relatives (2004)
History of Life (1999)
Integrative Biology of Organisms (1999)
Evolution of the Vertebrates (1998; 2000, 2002-2005)
Structure and Physiology of the Vertebrates (1997)
Instructor: The Biology and Evolution of the Dinosauria (1999-2000)
- 1993-1995 ***Utrecht University***
Teaching Assistant:
Paleontology, Sedimentology and Mineralogy
- Previous Employment:**
2005-2011 Assistant Professor of Biology, College of the Holy Cross
2000-2002 Curatorial Research Assistant, Department of Ornithology,
Museum of Comparative Zoology
1996-1997 Scientific Staff, Geology Department, Museon Science Museum,
The Hague, Netherlands

Research Grants and Awards:

- 2008- 2012 NSF DBI 0743327 (PI: Claessens; co-PI: Edwards). Aves 3D: An Online Database of Three-Dimensional Avian Skeletal Morphology (RUI). **US\$ 497,735** (entire budget to Claessens)
- 2010 College of the Holy Cross research travel grant **US\$2,500**
- 2007 Ardizzone Junior Faculty Research Grant **US\$ 2,960**
- 2007 Yale Peabody Museum Funding for Triassic Fieldwork **US\$ 5,000**
- 2006, 2007 College of the Holy Cross Summer Research Grants **US\$ 7,000**
- 2004 Welles Fund Grant, UC Berkeley **US\$ 950**
- 2002- 2004 National Science Foundation Doctoral Dissertation Improvement Grant (NSF-DDIG) **US\$ 9,986**
- 2000, 2002 Graduate Student Research Grant, Department of Organismic and Evolutionary Biology, Harvard University **US\$ 3,000**
- 1998 Harvard Graduate Student Council Conference Grant **US\$ 200**
- 1995- 1996 Canadian Graduate Student Research Award (NSERC; Royal Bank of Canada Scholarship) **CAN\$ 8,000**
- 1995- 1996 Molengraaff Fund Grant **DFL 3,000**

Honors:

- 2006 Curatorial Affiliate Position in the Division of Vertebrate Paleontology, Peabody Museum of Natural History, Yale University
- 2005 Premio Internacional de Investigacion en Paleontologia, Fundacion Conjunto Paleontologico Teruel Dinopolis (for best 2004 technical paper in paleontology, *J. Vert. Paleo.* **24**: 89-106)
- 2002, 2004 Certificates of Distinction in Teaching, Harvard University

Professional Service

- Academic Editor**, *PLoS ONE (Public Library of Science)* (2010-)
- Guest Editor**, *Journal of Experimental Zoology*, 311A Respiratory Evolution in Sauropsids Special Issue, pp. 549 – 646 (2008-2009)
- Reviewer** for the National Science Foundation (ABI, IOS) 2008, 2009; NSF Panelist (CDI), Arlington, VA, February 2008
- Reviewer** for the Biotechnology and Biological Sciences Research Council (BBSRC), UK, 2010; Deutsche Forschungsgemeinschaft (DFG), 2010; the National Research Foundation of South Africa, 2007
- Reviewer** for: *Nature*; *Journal of Vertebrate Paleontology*; *Paleobiology* (2); *Palaeontology*; *Anatomical Record*; *Journal of Morphology*; *Journal of Avian Biology*; *Acta Zoologica Sinica*; *Journal of Comparative Physiology B*; *Journal of Experimental Zoology Part A* (4); *Physiological and Biochemical Zoology*, *Naturwissenschaften* and two edited books (*The Sauropods*, U of California Press 2005, and *Biology of the Sauropod Dinosaurs*, U of Indiana Press 2010).
- Symposium organizer** (with P. O'Connor): *Respiratory Evolution in Sauropsids*. International Congress of Vertebrate Morphology 8, Paris 2007
- Jury Member**, A.S. Romer Prize Committee, Society of Vertebrate Paleontology (2009-)

Professional Service (continued) **Invited jury panel member**, Premio Internacional de Investigacion en Paleontologia, Fundacion Conjunto Paleontologico Teruel, Spain, 2006

Invited Discussion Leader: Ostrom Symposium on the Origin of Birds, Yale University, 1998

Member, Institutional Animal Care and Use Committee (IACUC)
College of the Holy Cross (2008-)

Professional Society Memberships:

1996-present Society of Vertebrate Paleontology (SVP)
2002-present Society for Integrative and Comparative Biology (SICB)
2003-present The Palaeontological Association
2004-present International Society of Vertebrate Morphologists

Selected Invited Seminars and Lectures:

Utrecht University (1997, 2002); Rheinische Friedrich-Wilhelms Universität, Bonn (1997); A. Watson Armour III Symposium, Field Museum, Chicago (2001); Free University of Amsterdam (2002); 6th Netherlands Earth Science Conference, Veldhoven (2002; keynote); Museum für Naturkunde, Humboldt Universität, Berlin (2003); Worcester State College (2005), Stony Brook University (2007), Institute for Vertebrate Paleontology and Paleoanthropology, Beijing (2008), Boston University (2009).

Selected Research Media Coverage:

Television: BBC Horizon, Evolve (History Channel), New England Cable News; *Radio*: Radio 1 (Netherlands), WTAG (USA)
Print: Science, Nature News, Science Now, Science News, Science Direct, CNN, BBC Discovery Magazine, National Geographic, ABC Australia, Boston Globe, Discovery, Iranian News Service, and others.

Selected Lay Audience Lectures:

Museon Science Museum, The Hague (1997, 2005); Elementary Schools in Alamogordo, Middelburg, Boston (1993-2002); Harvard Museums of Natural History Adult Education Lecture Series.

Education:

1997-2005 Harvard University, Department of Organismic and Evolutionary Biology. Thesis: The Evolution of Breathing Mechanisms in the Archosauria. Principal Advisor: Farish A. Jenkins, Jr.

1995-1996 Royal Tyrrell Museum of Palaeontology, Drumheller, AB, Canada
Thesis: Dinosaur Gastralia: Morphology and Function
Principal Advisor: Philip J. Currie

1990-1996 Utrecht University, Department of Earth Sciences
Thesis: Miocene Reptilian and Amphibian Faunas of Anatolia
Principal Advisor: Albert J. van der Meulen

Medical and Anatomical Training and Credentials:

- 2001 Vertebrate Surgery, Harvard Medical School
Professor A.L. Lage and Dr. L. Trudell
- 1998 Human Functional Anatomy, Harvard Medical School
Professors F.A. Jenkins, Jr. and L. Gehrke
- 1994-1995 Veterinary Anatomy, Utrecht University School of Veterinary
Medicine. Professor W. Hartman and Dr. J. Hasselaar

Field Experience:

- 2011 Mare aux Songes, Mauritius (paleontological fieldwork)
- 2009, 2010 Petrified Forest National Park, Chinle Fm, Arizona, and Ghost Ranch,
Chinle Fm, New Mexico (paleontological excavation)
- 2007 Chinle Formation, Southern Utah (paleontological excavation)
- 2006 Kaiparowits and Wahweap Fm., Utah (paleontological excavation)
- 2000 North Horn Fm., Utah (paleontological excavation)
- 1998 Triassic, Greenland (paleontological excavation)
- 1998 Kayenta Fm., Navajo Fm., Arizona (paleontological excavation)
- 1996, 1997 Dinosaur Provincial Park, Alberta, Canada (paleontological excavation)
Quarry Supervisor, Royal Tyrrell Museum Field Program
- 1994 Crete, Greece (geological mapping)
- 1992 Pyrenean Mountains, France, Spain (geological mapping)
- 1991 Northern Apenninian Mountains, Italy (geological mapping)
- 1991 Normandy, France (geological mapping)
- 1990 Ardenne Mountains, Belgium (geological mapping)

Principal Graduate Advisors:

Farish. A. Jenkins, Jr. (Harvard); Philip J. Currie (Canada); Albert J.
van der Meulen (Utrecht)

PhD committee members:

Farish A. Jenkins, Jr., Alfred W. Crompton, Andrew A. Biewener

Language Skills:

Dutch (fluent), English (fluent), German, French
limited proficiency in written Spanish, Latin, Greek

ANNOTATED LIST OF PUBLICATIONS

Leon P.A.M. Claessens

Student authors from the Claessens Laboratory at the College of the Holy Cross are indicated with an asterisk (*). Only student presentations where professor Claessens is a co-author are included in this list.

A. Peer reviewed articles in journals with international distribution:

1. **Claessens, L.P.A.M.** 2004. Dinosaur gastralia; origin, morphology, and function. *Journal of Vertebrate Paleontology* **24** (1): 89-106. ISI Impact factor (2008): 1.548
2. **Claessens, L.P.A.M.** 2004. Archosaurian respiration and the pelvic girdle aspiration breathing of crocodyliforms. *Proceedings of the Royal Society of London B: Biological Sciences* **271** (1547): 1461-1465. ISI Impact factor (2008): 4.248
3. O'Connor, P.M., and **L.P.A.M. Claessens**, 2005. Evidence for basic avian pulmonary design and flow-through ventilation in nonavian theropod dinosaurs. *Nature* **436**: 253-256. ISI Impact factor (2005): 32.2
4. O'Connor, P.M., and **L.P.A.M. Claessens**, 2009. Respiratory evolution in sauropsids: progress and new approaches. *Journal of Experimental Zoology*, **311A**: 549-550. ISI Impact factor (2008): 1.549
5. **Claessens, L.P.A.M.** 2009. A cineradiographic study of lung ventilation in *Alligator mississippiensis*. *Journal of Experimental Zoology*, **311A**: 563-585. ISI Impact factor (2008): 1.549
6. **Claessens, L.P.A.M.** 2009. The skeletal kinematics of lung ventilation in three basal bird taxa (emu, tinamou and guinea fowl). *Journal of Experimental Zoology*, **311A**: 586-599. ISI Impact factor (2008): 1.549
7. **Claessens, L.P.A.M.**, P.M. O'Connor, and D.M. Unwin, 2009. Respiratory evolution facilitated the origin of pterosaur flight and aerial gigantism. *PLoS ONE* 4(2): e4497. doi:10.1371/journal.pone.0004497. ISI impact factor (2010): 4.4

B. Book chapters:

1. **Claessens, L.P.A.M.** 1997. Gastralia. In: *Encyclopedia of Dinosaurs*. Currie, P.J., and Padian, K. (Eds.), Academic Press, San Diego, pp. 269-270.
2. *In Review*: Zanno, L., M. Loewen, A. Farke, G-S Kim, **L. Claessens** and C. McGarrity. Late Cretaceous theropod dinosaurs of southern Utah. In: *The Late Cretaceous of Southern Utah: Critical window into end Mesozoic Ecosystems*. Edited by A. Titus. Indiana University Press. *Expected publication date: 2011.*

C. Publications in journals with a primarily national distribution:

1. **Claessens, L.P.A.M.** 2006. Los huesos gastrales de los terópodos: insuflando vida a los dinosaurios [Theropod gastralia: breathing life into dinosaurs]. *Fundamental* **9**: 1-72.

[Popular rendition in Spanish and English of the award winning technical paper **Claessens, L.P.A.M.** 2004, *Dinosaur gastralia; origin, morphology, and function*, *Journal of Vertebrate Paleontology* **24** (1): 89-106, for the Premio Internacional de Investigacion en Paleontologia Award, 2005.]

D. Other publications:

1. Aves 3D (<http://Aves3D.org>), an online digital three-dimensional database of extant and extinct avian skeletal anatomy, funded by the National Science Foundation (NSF DBI 0743327) **US\$ 497,735**, Principal Investigator and Project Director: Leon Claessens, co-PI Scott Edwards, Harvard University.

[The Aves 3D database receives approximately 500 unique visitors per month from over 80 countries; source: Google Analytics Account for Aves 3D and the National Science Foundation Aves 3D Annual Report for 2010; the Aves 3D database has been reported upon in amongst others the journal *Science* (Vol. 327, page 765, Random Samples, February 12, 2010)].

E. Published Conference Proceedings:

1) Invited International Conference and Symposia Presentations:

1. **Claessens, L.P.A.M.** 2001. The function of the gastralia in theropod lung ventilation. *A. Watson Armour III Symposium, Abstracts, Field Museum, Chicago*. Convenors: Chris Brochu and Matthew Carrano. Oral Presentation.
2. **Claessens, L.P.A.M.** 2007. The relationship between skeletal constraint and pulmonary complexity in archosaurs. *ICVM 8 Abstracts, Journal of Morphology*, **268**. International Congress of Vertebrate Morphology 8. Paris, France. Convenors: Patrick O'Connor and Leon Claessens. Oral Presentation.
3. **Claessens, L.P.A.M.** 2010. Potential and limitations of the reconstruction of respiratory kinematics in extinct sauropsids. Invited contribution to the *Limitations of Computational Reconstructions in Functional Studies of Musculoskeletal Evolution Symposium* at the *9th International Conference of Vertebrate Morphology, Uruguay*, Abstracts: 23. Oral Presentation.
4. **Claessens, L.P.A.M.** and T. Hirasawa. 2010. Ribcage anatomy, skeletal constraint and kinematics in extant and extinct archosaurs. Invited contribution to *Joint Biology in the Fossil Record Symposium. Journal of Vertebrate Paleontology*, **30** (Suppl. to 3): 73A. Oral Presentation.

2) International Conference and Symposia Presentations:

1. **Claessens, L.P.A.M.** 1996. Dinosaur gastralia and their function in respiration. *Journal of Vertebrate Paleontology*, **16** (Suppl. to 3): 28A. 56th Annual Meeting of the Society of Vertebrate Paleontology. American Museum of Natural History, New York. Oral Presentation, Romer Prize Session.
2. **Claessens, L.P.A.M.** 1997. On the herpetofauna of some Neogene Eastern Mediterranean localities, and the occurrence of *Palaeobatrachus* and *Bufo* (Amphibia, Anura) in the Lower Miocene of Turkey. *Journal of Vertebrate Paleontology*, **17** (Suppl. to 3): 39A. 57th Annual Meeting of the Society of Vertebrate Paleontology. Field Museum, Chicago. Poster Presentation.
3. **Claessens, L.P.A.M.**, S.F. Perry and P.J. Currie. 1998. Using Comparative Anatomy to Reconstruct Theropod Respiration. *Journal of Vertebrate Paleontology*, **18** (Suppl. to 3): 34A. 57th Annual Meeting of the Society of Vertebrate Paleontology. Salt Lake City, Utah. Oral Presentation.
4. **Claessens, L.P.A.M.** 2002. Kinematic analysis of lung ventilation in crocodylians. *Journal of Vertebrate Paleontology*, **22** (Suppl. to 3): 44A. 62nd Annual Meeting of the Society of Vertebrate Paleontology. University of Oklahoma, Norman, Oklahoma. Oral Presentation.
5. **Claessens, L.P.A.M.** 2002. Analysis of the kinematics of lung ventilation in crocodylians. *Integrative and Comparative Biology*, **42** (6): 1208. (Also in: Society for Integrative and Comparative Biology Annual Meeting 2003, Abstracts: 136). Society for Integrative and Comparative Biology, Toronto, Canada. Oral Presentation.
6. **Claessens, L.P.A.M.** 2003. The skeletal kinematics of lung ventilation in birds. *Journal of Vertebrate Paleontology*, **23** (Suppl. to 3): 41A. 63rd Annual Meeting of the Society of Vertebrate Paleontology. Science Museum of Minnesota, St. Paul, Minnesota. Oral Presentation.
7. **Claessens, L.P.A.M.** 2004. Kinematics of crocodylian and avian lung ventilation: Investigating the evolution of breathing in extant and extinct Archosauria. *Journal of Morphology*, **260** (3): 283. International Congress of Vertebrate Morphology 7. Boca Raton, Florida. Oral Presentation.
8. **Claessens, L.P.A.M.** 2004. The identity and function of the pterosaur prepubis. *Journal of Vertebrate Paleontology*, **24** (Suppl. to 3): 46A. 64th Annual Meeting of the Society of Vertebrate Paleontology. Denver, Colorado. Poster Presentation.
9. **Claessens, L.P.A.M.** 2005. The skeletal respiratory pump and archosaurian pulmonary evolution. *Journal of Vertebrate Paleontology*, **25** (Suppl. to 3): 45A-46A. 65th Annual Meeting of the Society of Vertebrate Paleontology. Mesa, Arizona. Oral Presentation, Romer Prize Session.
10. **Claessens, L.P.A.M.**, P.M. O'Connor, and D.M. Unwin 2006. Evolution of the respiratory apparatus and breathing mechanisms in Pterosauria. *Journal of Vertebrate Paleontology*, **26** (Suppl. to 3): 50A. 66th Annual Meeting of the Society of Vertebrate Paleontology. Ottawa, Canada. Oral Presentation, one of five preselected for the meeting's official press release.

11. Wings, O., **L.P.A.M. Claessens**, and C.S. Sullivan, 2007. Crocodylian gastroliths past and present: their distribution and function. *5th Meeting of the European Association of Vertebrate Palaeontologists, Abstracts*: 68. Poster Presentation by O. Wings.
12. Neabore*, S. Loewen, M., Zanno, L., Getty, M. and **L. Claessens**, 2007. Three-dimensional scanning and analysis of the first diagnostic ornithomimid forelimb material from the Late Cretaceous Kaiparowits Formation. *Journal of Vertebrate Paleontology*, **27** (Suppl. to 3): 123A. 67th Annual Meeting of the Society of Vertebrate Paleontology. Austin, Texas. Poster Presentation, by student S. Neabore, under supervision.
13. **Claessens, L.P.A.M.**, P.M. O'Connor, and D.M. Unwin 2007. Lung ventilation in pterosaurs. Wellnhofer Flugsaurier meeting, abstracts. First Wellnhofer Flugsaurier meeting, Munich, Germany. Oral Presentation.
14. **Claessens, L.P.A.M.** and M. Vickaryous 2008. A reevaluation of prepubic skeletal elements in archosaurs. *Journal of Vertebrate Paleontology*, **28** (Suppl. to 3): 64A. 68th Annual Meeting of the Society of Vertebrate Paleontology. Cleveland, Ohio. Oral Presentation.
15. **Claessens, L.P.A.M.**, S.V. Edwards, R. Martinez*, M. Krzyzak*, M. Eckardt*, G. Leslie*, M. Marcucci*, S. Neabore*, I. Vrcek*, S. Moss*, and K. Grassi*, 2009. Aves 3D: A new online resource for avian skeletal anatomy. *Society for Integrative and Comparative Biology, Abstracts, 2009 Annual Meeting*. Society for Integrative Biology, Boston. Poster Presentation, with 9 students.
16. Zanno, L., M. Loewen, **L. Claessens**, and S. Sampson 2009. Late Cretaceous theropod dinosaurs of Southern Utah: progress and perspectives. *Advances in Western Interior Late Cretaceous Paleontology and Geology, Abstracts*: 50. St George, Utah. (Oral Presentation by L. Zanno, collaborator).
17. Hutchison, J.H., R. Irmis, J. Sertich, S. Nesbitt, A. Titus and **L. Claessens**, 2009. Late Cretaceous crocodyliforms from Grand Staircase Escalante National Monument, Utah. *Advances in Western Interior Late Cretaceous Paleontology and Geology, Abstracts*: 27. St. George, Utah. (Oral Presentation by R. Irmis, collaborator).
18. Drake, A.G., M. Krzyzak*, H. Ehlers, R. Martinez*, and **L. Claessens**, 2009. A preliminary geometric morphometric analysis of the ecomorphology of the avian sternum. *First Iberian Symposium on Geometric Morphometrics*. Barcelona, Spain. Oral Presentation by A. Drake (Claessens Lab Research Technician).
19. **Claessens, L.P.A.M.**, S. Edwards, A. Drake, R. Martinez*, M. Eckardt*, M. Krzyzak*, and M. Marcucci*, 2009. Aves 3D: A new online resource for digital avian skeletal anatomy. *First Iberian Symposium on Geometric Morphometrics*. Barcelona, Spain. Poster Presentation by A. Drake (Claessens Lab Research Technician).
20. **Claessens, L.P.A.M.**, S. Edwards, A. Drake, R. Martinez*, and M. Krzyzak*, 2009. Aves 3D: a new online resource for the skeletal anatomy of extant and extinct birds. *Journal of Vertebrate Paleontology*, **29** (Suppl. to 3): 79A. Poster Presentation.

21. Blumhagen*, E., M. Cooper*, M. Dmytriw*, M. Eckardt*, H. Ehlers, S. John*, Z. Lavender*, R. Martinez*, A. Drake, S. Edwards, **L. Claessens**, 2010. Aves 3D: A new online resource for the three-dimensional skeletal anatomy of extant and extinct birds. *9th International Conference of Vertebrate Morphology, Uruguay*: 241.
22. Lavender*, Z., A. Drake, M. Loewen, L. Zanno and **L. Claessens**, 2010. Three-dimensional geometric morphometric analysis and univariant measurement analysis on an undescribed *Ornithomimus* manus. *Journal of Vertebrate Paleontology*, **30** (Suppl. to 3): 120A.
23. Blumhagen*, E., A. Drake, F. Zhang, X. Xu, and **L. Claessens**, 2010. Three-dimensional digital reconstruction of fossil birds and non-avian theropods preserved in slab and counterslab using laser surface scanning. *Journal of Vertebrate Paleontology*, **30** (Suppl. to 3): 60A.
24. Lavender*, Z., Loewen, M. and **L. Claessens**, 2011. New ornithomimid forelimb material from the Late Cretaceous Kaiparowits Formation. *Abstract submitted for the 2011 Society for Integrative and Comparative Biology Meeting, Salt Lake City, Utah. Student Zach Lavender presenting.*

3) Invited National Conference and Symposia Presentations:

1. **Claessens, L.P.A.M.** 2002. Gastralial aspiration in the Theropoda (Dinosauria), and the evolution of the avian lung. *6th Netherlands Earth Science Conference, Veldhoven, Netherlands, Abstracts*, 5.1 (keynote address).

Student authors from the Claessens Laboratory at the College of the Holy Cross are indicated with an asterisk (*). Only student presentations where professor Claessens is a co-author are included in this list.