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Museum of Comparative Zoology
Department of Organismic and Evolutionary Biology
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CURRENT POSITION

Harvard University
Postdoctoral Fellow

Cambridge, MA
October 2012 – Present

EDUCATION

Complutense University Madrid, Spain
PhD, Biology of Conservation 2011
Dissertation: Insights into the evolutionary biology of a cosmopolitan earthworm:
phylogeography, phylogeny and reproductive biology in *Aporrectodea trapezoides* (Oligochaeta:
Lumbricidae).

MSc, Biology. 2009

BS, Biology. 2006

FELLOWSHIPS, GRANTS AND AWARDS

NSF grant (with Prof. Gonzalo Giribet and Prof. Gustavo Hormiga) 2015-2017
Assembling the spider tree of life through phylogenomics

Star Family Postdoctoral Fellow 2014
Harvard University

Putnam Expedition Grant 2014, 2013
Museum of Comparative Zoology, Harvard University (\$ 12,354 in 2014)(\$10,385 in 2013)

Postdoctoral Award for Professional Development 2014
Harvard University (\$ 1,000)

NSF grant #1144417 (with Prof. Gonzalo Giribet) 2012-2013
ARTS: Taxonomy and systematics of selected Neotropical clades of arachnids

Postdoctoral Award	2012
Ramón Areces Foundation (€ 67,200)	
Postdoctoral Award	2012
Caja Madrid Foundation (€ 36,000)	
Predoctoral Award for Professional Development	2009, 2010
Complutense University (€ 5,100 in 2009) (€ 5,000 in 2010)	
Honorary Research Fellow	2007-2011
Complutense University, Department of Zoology and Physical Anthropology	
Predoctoral Fellowship	2007
Complutense University / Ministry of Education, Spain	
Departmental Collaboration Grant	2006
Ministry of Education, Spain (€ 3,000)	

RESEARCH EXPERIENCE

Harvard University	Cambridge, MA
Postdoctoral Fellow; Advisor: Prof. Gonzalo Giribet	2012-Present
Evolutionary biology in invertebrates:	
<ul style="list-style-type: none"> - Phylogenomic resolution of the tree of life in different invertebrate groups (arachnids, myriapods and oligochaetes). - Biodiversity assessment and species delimitation in arachnids. - Phylogeny and phylogeography of different invertebrate groups (arachnids, myriapods, oligochaetes and moluscs). - Optimization of new imaging techniques for the visualization of fresh and museum specimens. - Differential gene expression in coral settlement and tardigrades under extreme conditions (ongoing). - Comparative genomics in arthropods, tardigrades and rotifers (ongoing). 	
Complutense University	Madrid, Spain
Research Fellow; Advisor: Prof. Darío J. Díaz Cosín	2011-2012
Phylogenetic insights into several cosmopolitan earthworms	
<ul style="list-style-type: none"> - Comparative phylogeography, population dynamics and cladogenesis in cosmopolitan earthworms. - Ecological interactions of plants and soil fauna. 	
Graduate Researcher; Advisor: Darío J. Díaz Cosín	2007-2011
Evolutionary biology in a cosmopolitan earthworm species	
<ul style="list-style-type: none"> - Life cycle and reproductive biology. 	

- Phylogeography and distribution patterns.
- Phylogeny of a complex of species.

Eberhard-Karls Universität

Tübingen, Germany

2010

Visiting Research Fellow; Advisor: Dr. Michael Heethoff

Ultrastructural analysis of reproductive structures in sexual and parthenogenetic forms in a cosmopolitan earthworm.

Visiting Research Fellow; Advisor: Dr. Michael Heethoff

2009

Hybridization processes in a complex of species in cosmopolitan earthworms through single-copy genes.

TEACHING EXPERIENCE

Harvard University

Cambridge, MA

2013-2015

Undergraduate Advisor

Graduate students training in RNAseq techniques

2013-2014

Complutense University

Madrid, Spain

Fall 2010

Teaching Assistant, Experimental Biology

Spring/Fall 2011

Spring 2012

Guest Lecturer, Molecular Phylogenetics (Master program)

Fall 2011, Fall 2012

Undergraduate Advisor

2009-2012

Senior thesis Advisor

2010-2011

Graduate Advisor

2011- Present

RELATED PROFESSIONAL EXPERIENCE

Life Sciences Education Office, Harvard University

Cambridge, MA

2014 - 2015

Graduate and Undergraduate Mentor Certification

Harvard Grad Women in Science and Engineering

Cambridge, MA

Graduate and Undergraduate Mentor

2014 - Present

Association of Spanish Scientists in USA (ECUSA)

Cambridge, MA

International Mentoring Program, Mentor

2014 - Present

Pre- and Post-Doctoral Fellows Association, Department of Zoology and Physical Anthropology, Complutense University of Madrid
Official Representative

Madrid, Spain
2011-2012

Reviewer for the following journals and agencies

- | | |
|---|----------------|
| - Soil Biology and Biochemistry | 2011 - present |
| - Pedobiologia | 2011 - present |
| - Molecular Phylogenetics and Evolution | 2012 - present |
| - Biological Journal of the Linnean Society | 2012 - present |
| - Heredity | 2013 - present |
| - PLoS ONE | 2013 - present |
| - Marine Ecology | 2013 - present |
| - Biology Letters | 2014 – present |
| - Molecular Ecology | 2014 – present |

X International Symposium on Earthworm Ecology

June 2014. Athens, GA

Session chair; symposium organizer

Barcelona University

Molecular Phylogeny course. Participant.

Barcelona, Spain
Summer 2008

National Genotyping Center

Introduction to the study of SNPs applied to genetic epidemiology. Participant.

Madrid, Spain
Summer 2008

ONGOING COLLABORATIONS WITH ACADEMIC INSTITUTIONS

Harvard University

Department of Organismic and Evolutionary Biology

Cambridge, MA

Prof. Gonzalo Giribet (postdoctoral advisor)

Dr. Ana Tourinho

Dr. Sarah Lemer

Dr. David Combosch

Dr. Christopher Laumer

Dr. Dennis Persson

Department of Molecular and Cell Biology

Prof. Matthew Meselson

Dr. Dominic Mao

Dr. Hanan Dahche

Department of Environmental Health, Harvard School of Public Health

Dr. Bernardo Lemos

The George Washington University

Prof. Gustavo Hormiga

Washington D.C.

The Natural Museum of Natural History	London, UK
Dr. Gregory D. Edgecombe	
Smithsonian Marine Station	Fort Pierce, FL
Dr. Valerie Paul	
American Museum of Natural History	New York, NY
Dr. Prashant Sharma	
Auckland University	Auckland, New Zealand
Dr. Thomas Buckley	
Universitat de Barcelona	Barcelona, Spain
Dr. Ana Riesgo	
Cardiff University	Cardiff, U.K
Dr. Marta Novo	
Royal Ontario Museum	Toronto, Canada
Dr. Sebastian Kvist	
Universidad Autónoma del Estado de Hidalgo	Hidalgo, Mexico
Dr. Julián Bueno-Villegas	
Universidad Complutense de Madrid	Madrid, Spain
Prof. Darío Díaz Cosín	
Dr. Dolores Trigo	
Dr. Mónica Gutiérrez	
Daniel Fernández Marchán, Ms.B.	
Universidad Autónoma de Madrid	Madrid, Spain
Patricia Álvarez-Campos, Ms.B.	

PEER-REVIEWED PUBLICATIONS

PUBLISHED / IN PRESS

32. **Fernández, R.**, Giribet, G. in press. Unnoticed in the tropics: phylogenomic resolution of the poorly-known arachnid order Ricinulei (Arachnida). Royal Society Open Science.

31. Sharma, P., **Fernández, R.**, González Santillán, E., Monod, L. 2015. Phylogenomic resolution of scorpions reveals multilevel discordance with morphological phylogenetic signal. Proceedings of the Royal Society B: Biological Sciences 282: 20142953.
30. Marchán, D.F., Refoyo, P., Novo, M., **Fernández, R.**, Trigo, D., Díaz Cosín, D.J. 2015. Predicting soil micro-variables and the distribution of an endogeic earthworm species through a model based on large-scale variables. Soil Biology and Biochemistry 81: 124-127.
29. **Fernández, R.**, Vélez, S., Giribet, G. 2014. Linking genetic diversity and morphological disparity: biodiversity assessment of a highly unexplored family of harvestmen (Arachnida: Opiliones: Neopilionidae) in New Zealand. Invertebrate Systematics 28: 590-604.
28. Vélez, S., **Fernández, R.**, Giribet, G. 2014. A molecular phylogenetic approach to the New Zealand species of Enantiobuninae (Opiliones : Eupnoi : Neopilionidae). Invertebrate Systematics 28: 565-589.
27. Novo, M., **Fernández, R.**, Marchán, D.F., Trigo, D., Díaz Cosín, D.J., Giribet, G. 2014. Unearthing the historical biogeography of Mediterranean earthworms (Annelida: Hormogastridae). Journal of Biogeography (doi: 10.1111/jbi.12447).
26. **Fernández, R.**, Giribet, G. 2014 Phylogeography and species delimitation in the New Zealand endemic hypervariable harvestman species *Aoraki denticulata* (Arachnida, Opiliones, Cyphophthalmi). Invertebrate Systematics 28: 401-414.
25. **Fernández, R.**, Hormiga, G., Giribet, G. 2014. Phylogenomic analysis of spiders reveals non-monophyly of orb-weavers. Current Biology 24, 1772-1777. Highlighted in *Nature News* (<http://www.nature.com/news/spider-gene-study-reveals-tangled-evolution-1.15578>)
24. Giribet, G., **Fernández, R.**, Boyer, S.L., 2014. On four poorly known harvestmen from New Zealand (Arachnida, Opiliones: Cyphophthalmi, Eupnoi, Dyspnoi, Laniatores). New Zealand Journal of Zoology, <http://dx.doi.org/10.1080/03014223.2014.930054>.
23. Marchán, D.F., **Fernández, R.**, Novo, M., Díaz Cosín, D.J. 2014. New light into the hormogastrid riddle: morphological and molecular description of *Hormogaster joseantonioi* sp. n. (Annelida, Clitellata, Hormogastridae). ZooKeys 414: 1-17.
22. **Fernández, R.**, Vahtera, V., Laumer, C.E., Libro, S., Kaluziak, S., Sharma, P.P., Pérez-Porro, A., Edgecombe, G.D., Giribet, G., 2014. Evaluating topological conflict in centipede phylogeny using transcriptomic data sets. Molecular Biology and Evolution, 31(6): 1500-1513.
21. **Fernández, R.**, Kvist, S., Lenihan, J., Giribet, G., Ziegler, A., 2014. Sine systemate chaos? A versatile tool for earthworm taxonomy: non-destructive imaging of freshly fixed and museum specimens using micro-computed tomography. PLoS ONE. DOI: 10.1371/journal.pone.0096617

20. Lenihan, J., Kvist, S., **Fernández, R.**, Giribet, G., Ziegler, A., 2014. A dataset comprising four micro-computed tomography scans of freshly fixed and museum earthworm specimens. *GigaScience* 3:6 <http://dx.doi.org/10.1186/2047-217X-3-6>
19. **Fernández, R.**, Lemer, S., McIntyre, E., Giribet, G. 2014. Comparative phylogeography and population genetic structure of three widespread mollusc species in the Western Mediterranean and near Atlantic. *Marine Ecology*. DOI: 10.1111/maec.12178
18. Díaz Cosín, D.J., Novo, M., **Fernández, R.**, Marchán, D.F., Gutiérrez, M., 2014. A new species within a controversial genus: *Eiseniona gerardo* sp. n. (Annelida, Lumbricidae)-description of a new species of earthworm from Spain based on morphological and molecular data. *Zootaxa* 399, 71-87.
17. Gutiérrez, M., Ranera, E., **Fernández, R.**, Novo, M., Trigo, D., 2014. Does the invasion of the exotic tree *Ailanthus altissima* affect the soil arthropod community? The case of a riparian forest of the Henares River (Madrid). *Plant and Soil* 62, 39-48.
16. Novo, M., **Fernández, R.**, Granado-Yela, C., Gutiérrez, M., Fernández-Marchán, D., Díaz Cosín, D.J. 2013. Does the order of copulation matter? Experimental paternity analyses in the earthworm *Hormogaster elisae* (Annelida: Hormogastridae). *Pedobiologia* 56, 97-104.
15. **Fernández, R.**, Almodóvar, A., Novo, M., Gutiérrez, M., Díaz Cosín, D.J., 2013. Earthworms, good indicators for palaeogeographic studies? Testing the genetic structure and demographic history in the peregrine earthworm *Aporrectodea trapezoides* (Dugès, 1828) in southern Europe. *Soil Biology and Biochemistry* 58, 127-135.
14. Novo, M., **Fernández, R.**, Fernández-Marchán D, Gutiérrez M, Díaz Cosín D., 2012. Compilation of morphological and molecular data, a necessity for taxonomy: The case of *Hormogaster abbatissae* sp. n. (Annelida, Clitellata, Hormogastridae). *Zookeys* 242, 1-16.
13. Novo, M., Almodóvar, A., **Fernández, R.**, Trigo, D., Díaz Cosín, D.J., Giribet, G., 2012. Appearances can be deceptive: different diversification patterns within a group of Mediterranean earthworms (Oligochaeta, Hormogastridae). *Molecular Ecology* 21, 3776-3793.
12. **Fernández, R.**, Almodóvar, A., Novo, M., Díaz Cosín, D.J., 2012. Adding complexity to the complex: phylogeny and origin of parthenogenesis in the *Aporrectodea caliginosa* species complex (Oligochaeta, Lumbricidae). *Molecular Phylogenetics and Evolution* 64, 368-379.
11. Díaz Cosín, D., Novo, M., **Fernández, R.**, 2011. Reproduction of Earthworms: Sexual Selection and Parthenogenesis. In: Karaca, A. (ed.), *Biology of Earthworms, Soil Biology*, Volume 24, 69-86, ISBN 978-3-642-14635-0.
10. **Fernández, R.**, Bergman, P., Almodóvar, A., Díaz Cosín, D.J., Heethoff, M. 2011. Ultrastructural and molecular insights into three populations of *Aporrectodea trapezoides* (Dugès, 1828) (Oligochaeta, Lumbricidae) with different reproductive modes. *Pedobiologia* 54, 281-290.

9. Novo, M., Almodóvar, A., **Fernández, R.**, Giribet, G., Díaz Cosín, D.J. 2011. Understanding the biogeography of a group of earthworms in the Mediterranean basin—The phylogenetic puzzle of Hormogastridae (Clitellata: Oligochaeta). *Molecular Phylogenetics and Evolution* 61, 125-135.
8. **Fernández, R.**, Almodóvar, A., Novo, M., D., Gutiérrez, M., Díaz Cosín, D.J. 2011. A vagrant clone in a peregrine species: Phylogeography, high clonal diversity and geographical distribution in the earthworm *Aporrectodea trapezoides* (Dugès, 1828). *Soil Biology and Biochemistry* 43, 2085-2093.
7. Gutiérrez, M., Jesús, J.B., Trigo, D., **Fernández, R.**, Novo, M., Díaz Cosín, D.J. 2010. Relationships among spatial distribution of soil microarthropods, earthworm species and soil properties. *Pedobiologia* 53, 381-389.
6. Novo, M., Almodóvar, A., **Fernández, R.**, Gutiérrez, M., Díaz Cosín, D.J. 2010. Mate choice of an endogeic earthworm revealed by microsatellite markers. *Pedobiologia* 53, 375-379.
5. **Fernández, R.**, Novo, M., Almodóvar, A., D., Díaz Cosín, D.J. 2010. Life cycle and reproductive traits in *Aporrectodea trapezoides* (Dugès, 1828) (Oligochaeta, Lumbricidae) in laboratory cultures. *Pedobiologia* 53, 295-299.
4. Novo, M., Almodóvar, A., **Fernández, R.**, Trigo, D., Díaz Cosín, D.J. 2010. Cryptic speciation of hormogastrid earthworms revealed by mitochondrial and nuclear data. *Molecular Phylogenetics and Evolution* 56, 507-512.
3. Díaz Cosín, D.J., Hernández, P., Trigo, D., **Fernández, R.**, Novo, M. 2009. Algunos aspectos del ciclo biológico del endemismo ibérico *Hormogaster elisae* Álvarez, 1977 (Oligochaeta, Hormogastridae) en cultivos de laboratorio. *Boletín de la Real Sociedad Española de Historia Natural (Sección Biológica)* 103, 49-57.
2. Gutiérrez, M., Jesús, J.B., Trigo, D., **Fernández, R.**, Díaz Cosín, D.J. 2009. The influence of *Hormogaster elisae* (Oligochaeta, Hormogastridae) on the colonisation of defaunated soil by microarthropods in laboratory cultures. *Pedobiologia* 52, 163-170.
1. Hernández, P., **Fernández, R.**, Novo, M., Trigo, D., Díaz Cosín, D.J. 2007. Geostatistical and multivariate analysis of the horizontal distribution of an earthworm community in El Molar (Madrid, Spain). *Pedobiologia* 51, 13-21.

SUBMITTED

35. Novo, M., **Fernández, R.**, Andrade, S., Marchán, D.F., Cunha, L., Díaz Cosín, D.J. Phylogenomic analyses of a Mediterranean earthworm family (Annelida: Hormogastridae). *Molecular Phylogenetics and Evolution*.
34. **Fernández, R.**, Novo, M., Marchán, D.F., Giribet, G., Díaz Cosín, D.J. Insights into the origin of parthenogenesis in oligochaetes: strong genetic structure in a cosmopolitan earthworm is not related to reproductive mode. *Journal of Evolutionary Biology*.

33. **Fernández, R.**, Novo, M., Marchán, D.F., Díaz Cosín, D.J. under review. Similar diversification patterns in cosmopolitan earthworms. Molecular Phylogenetics and Evolution.

INVITED TALKS

Museum of Comparative Zoology, Harvard University

Title: Phylogenomic insights into evolution of arachnids and myriapods.

Cambridge, MA

September 2015 (scheduled)

Postdoc Science Club, Harvard University and MIT

Title: The arthropod tree of life: reconciling genes, isoforms, fossils, morphology and biogeography.

Cambridge, MA

May 2015

The Broad Institute of Harvard/MIT (Annual retreat)

Title: Unraveling the tree of life through phylogenomics in non-model organisms.

Cambridge, MA

September 2014

Eberhard-Karls Universität

Title: Ecological and molecular insights into reproductive traits in cosmopolitan earthworms.

Tübingen, Germany

May 2010

Complutense University

Title: Molecular phylogeny in earthworms: a practical case.

Madrid, Spain

March 2009

CONFERENCE PRESENTATIONS

Evolution

June 2015. Guarajá, Brazil (scheduled)

- **Fernández, R.**, Edgecombe, G.E., Hormiga, Giribet, G., The arthropod tree of life: reconciling genes, isoforms, fossils, morphology and biogeography. Oral presentation.

Evolution

June 2014. Raleigh, NC

- Ballesteros, J., **Fernández, R.**, Sharma, P., Giribet, G., Hormiga, G. Comparative transcriptomics reveals orthologous loci for spider phylogenetics. Poster presentation.

X International Symposium on Earthworm Ecology

June 2014. Athens, GA

- **Fernández, R.**, Kvist, S., Lenihan, J., Giribet, G., Ziegler, A. Sine systemate chaos? A versatile tool for earthworm taxonomy: non-destructive imaging of freshly fixed and museum specimens using micro-computed tomography. Oral presentation.
- **Fernández, R.**, Novo, M., Marchán, D.F., Díaz Cosín, D.J. Similar spatial radiation in cosmopolitan earthworms. Poster presentation.

- Marchán, D.F., Novo, M., **Fernández, R.**, Díaz Cosín, D.J. Getting closer: study at a micro geographical scale of the cryptic speciation in *Hormogaster elisae* (Oligochaeta, Hormogastridae). Poster presentation.
- Novo, M., **Fernández, R.**, Marchán, D.F., Trigo, D., Díaz Cosín, D.J. Unearthing the historical biogeography of Mediterranean earthworms (Annelida: Hormogastridae). Oral presentation.

XVI International Colloquium on Soil Zoology August 2012. Coimbra, Portugal

- Novo, M., **Fernández, R.**, Gutiérrez, M., Trigo, D., Díaz Cosín, D.J. Morphological versus molecular evolution: different patterns within Hormogastridae earthworms. Poster presentation.

I Iberian Congress on Animal Systematics January 2012. Madrid, Spain

- Novo, M., **Fernández, R.**, Almodóvar, A., Díaz Cosín, D.J., Giribet, G. La historia de una familia de lombrices de tierra en el Mediterráneo (Oligochaeta: Hormogastridae) contada por marcadores moleculares. Oral presentation.
- **Fernández, R.**, Novo, M., Gutiérrez, M., Almodóvar, A., Díaz Cosín, D.J. Genetic variability and population genetics in *Aporrectodea trapezoides* (Dugès, 1828) (Oligochaeta, Lumbricidae). Oral presentation. **1st prize, best oral presentation.**

IX International Symposium on Earthworm Ecology September 2010. Xalapa, Mexico

- **Fernández, R.**, Novo, M., Gutiérrez, M., Almodóvar, A., Díaz Cosín, D.J. The neverending story of the *Aporrectodea caliginosa* species complex: new insights into its phylogeny. Oral Communication.
- Novo, M., **Fernández, R.**, Gutiérrez, M., Almodóvar, A., Díaz Cosín, D.J. The taxonomic puzzle of Hormogastrid earthworms: molecular insights. Oral Communication.
- **Fernández, R.**, Novo, M., Simancas, B., Fernández-Marchán, D., Díaz Cosín, D.J. Parthenogenesis in *Aporrectodea trapezoides* (Dugès, 1828): reproductive traits in field-collected and laboratory-reared earthworms. Poster presentation.
- **Fernández, R.**, Novo, M., Almodóvar, A., Díaz Cosín, D.J. Genetic variability and population genetics in *Aporrectodea trapezoides* (Dugès, 1828) (Oligochaeta, Lumbricidae). Poster presentation.
- Gutiérrez, M., Salmon, S., **Fernández, R.**, Trigo, D. Importance of ammonium content in the attraction or repulsion of Collembola to the excreta of earthworms. Poster presentation.
- Novo, M., **Fernández, R.**, Almodóvar, A., Díaz Cosín, D.J. Cryptic speciation within *Hormogaster elisae* revealed by molecular data. Poster presentation.

- Novo, M., **Fernández, R.**, Jesús, J.B., Almodóvar, A., Díaz Cosín, D.J. The tale of a lazy worm: Reproductive behaviour of *Hormogaster elisae* revealed by microsatellite markers. Poster presentation.
- **Fernández, R.**, Novo, M., Jesús, J.B., Trigo, D., Díaz Cosín, D.J. *Aporrectodea trapezoides* (Dugès, 1828): life cycle in singletons and twins. Poster presentation.

XII Congress of the European Society for Evolutionary Biology August 2009. Torino, Italy

- **Fernández, R.**, Novo, M., Jesús, J.B., Almodóvar, A., Díaz Cosín, D.J. High genetic variability in the parthenogenetic earthworm *Aporrectodea trapezoides* (Oligochaeta,Lumbricidae). Poster presentation.
- Novo, M., **Fernández, R.**, Trigo, D., Almodóvar, A., Díaz Cosín, D.J. Cryptic speciation of hormogastrid earthworms in Central Iberian Peninsula is not related to soil properties but to biogeography. Poster presentation.

XV International Colloquium on Soil Zoology August 2008. Curitiba, Brasil

- Novo, M., **Fernández, R.**, Almodóvar, A.; Díaz Cosín, D.J. High genetic divergence among *Hormogaster* populations in Central Iberian Peninsula revealed by COI gene. Poster presentation.
- Gutiérrez, M., Salmone, S., Díaz Cosín, D.J., **Fernández, R.** The impact of the earthworm *Aporrectodea giardi* on the behaviour of the collembola *Heteromurus nitidus*. Poster presentation.
- Gutiérrez, M., Salmone, S., Trigo Aza, D., **Fernández, R.** The effect of the earthworm *Hormogaster elisae* on the abundance of the collembola *Heteromurus nitidus* in soil from El Molar (Madrid). Poster presentation.

SOCIETY MEMBERSHIPS

European Society for Evolutionary Biology; Society for Molecular Biology and Evolution; Spanish Society for Evolutionary Biology; ECUSA (Association of Spaniard Scientists in USA)

REFERENCES

Gonzalo Giribet, Ph.D.

Alexander Agassiz Professor of Zoology in the Museum of Comparative Zoology
 Professor of Organismic and Evolutionary Biology
 Curator of Invertebrates, Museum of Comparative Zoology
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Earth Sciences Department, Invertebrates and Plants Division
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