PAOLO PIRAS

Curriculum Vitae

Roma,
14-05-2021

Part I – General Information

Full Name	PAOLO PIRAS
Spoken Languages	Italian, French, English, Spanish

Part II – Education

Type	Year	Institution	Notes
University graduation	2002	University Degree in Natural Sciences at the University "Sapienza" University of Rome. Degree Thesis : "Studio di un gavialide del Miocene inferiore del Pakistan sud-orientale" (A gavialid from Lower Miocene of south-eastern Pakistan), tutors: Prof. Daniela Esu and Prof. Anastassios Kotsakis.	Evaluation: 110/110 con Lode
Pre-doctorate training	2003-2004	"Corsi di perfezionamento all'estero" , "Sapienza"; one year Project: Revision of the Oligocene alligatoroid *Hispanochampsa muelleri*.	"Università Autonoma de Madrid"; supervisor: Prof. Angela Buscalioni.
PhD	2003-2007	Ph.D in Geodynamics obtained at former Geological Sciences Department of Roma Tre University, Rome, Italy: Thesis title: Theoretical morphology of fossil and recent crocodiles skull by means of 3- and 2-dimensional geometric morphometrics. Tutor: Prof. Anastassios Kotsakis.	"Esito positivo"
Licensure ASN	13-5-2019	"Abilitazione Scientifica Nazionale" prof II fascia area 04/A2, SSD GEO/01	Habilitated from 13-05-2019 to 13-05-2025

Part III – Appointments

IIIA – Academic Appointments

Start	End	Institution	Position
1-01-2008	31/12/2008	Pierre et Marie Curie University, Paris VI.	**Post-doc** fellowship at Pierre et Marie Curie University (Paris VI)-Laboratory for adaptive mechanisms from organisms to communities on a project about Geometric Morphometrics of *Arvicola terrestris* at European level. Both extinct and extant taxa of the genus *Arvicola* were studied
1-6-2010	31-5-2011	Former Geological Sciences Department (now Sciences Department), Roma Tre University	**Post-doc** fellowship at former Geological Sciences Department (now Sciences Department), Roma Tre University in the context of **PRIN 2008** project "Paleobiogeografia e processi evolutivi negli ecosistemi plio-quaternari insulari del Mediterraneo occidentale.".Title "Studio di Ctenodactylidae e Muridae fossili della Sardegna: relazioni filogenetiche e tendenze evolutive". **Legge 23/12/97 n. 449**
1-6-2011	31-5-2012	Former Geological Sciences Department (now Sciences Department), Roma Tre University	**Post-doc** fellowship at former Geological Sciences Department (now Sciences Department), Roma Tre University in the context of **PRIN 2008** project "Paleobiogeografia e processi evolutivi negli ecosistemi plio-quaternari insulari del Mediterraneo occidentale.".Title "Studio di Ctenodactylidae e Muridae fossili della Sardegna: relazioni filogenetiche e tendenze evolutive". **Legge 23/12/97 n. 449**
1-10-2013	30-9-2014	"Sapienza", University of Rome, former Department of Cardiovascular Sciences.	**Post-doc** fellowship at "Sapienza", University of Rome, Department of Cardiovascular Sciences. "Studio delle traiettorie morfologiche in soggetti sani e portatori di cardiopatia attraverso le immagini ecocardiografiche raccolte con metodica tridimensionale mediante tecniche di morfometria geometrica". **Legge 30/12/2010 n. 240.**

1-10-2014	30-9-2015	"Sapienza", University of Rome, Department of Structural Engineering and Geotechnics.	**Post-doc** fellowship at "Sapienza", University of Rome, Department of Structural Engineering and Geotechnics. "Ricostruzione della dinamica ventricolare cardiaca per mezzo della Meccanica del Continuo e della Morfometria Geometrica". **Legge 30/12/2010 n. 240.**
1-3-2016	28-2-2017	"Sapienza", University of Rome, Department of Structural Engineering and Geotechnics.	**Post-doc** fellowship at "Sapienza", University of Rome, Department of Structural Engineering and Geotechnics. "La meccanica come mezzo clinico per l'individuazione di patologie cardiache nell'uomo". **Legge 30/12/2010 n. 240.**
1-3-2017	28-2-2018	"Sapienza", University of Rome, former Department of Cardiovascular Sciences.	**Post-doc** fellowship at "Sapienza", University of Rome, Department of Cardiovascular Sciences. "Validation and preparation of the trial protocol and patient recruitment for personal health system backend platform design and implementation in reference to Task 6.1 and Deliverable 6.2 of the HEARTMAN Project". **Legge 30/12/2010 n. 240**
1-3-2018	28-2-2019	"Sapienza", University of Rome, former Department of Cardiovascular Sciences.	**Post-doc** fellowship at "Sapienza", University of Rome, Department of Cardiovascular Sciences. "Validation and preparation of the trial protocol and patient recruitment for personal health system backend platform design and implementation in reference to Task 6.1 and Deliverable 6.2 of the HEARTMAN Project". **Legge 30/12/2010 n. 240**

IIIB – Other Appointments

Start	End	Institution	Position
23-12-2008	23-3-2009	Roma Tre University, former Geological Sciences Department (now Sciences Department).	Fellowship: "Contratto di collaborazione per la Realizzazione di un data-set bibliografico e iconografico per analisi di morfometria geometrica su micro mammiferi fossili e recenti".
25-9-	25-11-	Roma Tre University, former	Fellowship: "Contratto di

2009	2009	Geological Sciences Department (now Sciences Department).	collaborazione per la Ristrutturazione ed aggiornamento scientifico del sito web del Laboratorio di Paleontologia dei Vertebrati e predisposizione del materiale scientifico per la realizzazione del sito web del Centro di Ecologia Evolutiva" at former Geological Sciences Department (now Science Department), Roma Tre University
25-1-2010	24-2-2010	Former Geological Sciences Department (now Science Department), Roma Tre University	Fellowship: "Contratto di collaborazione per l' attività di supporto e consulenza scientifica per l'organizzazione del workshop Geometric Morphometrics Laboratory for Systematics and Evolutionary Ecology 2010".
7-4-2010	7-5-2010	Dipartimento di Biologia Animale e dell'Uomo dell'Università degli Studi di Roma "La Sapienza"	Fellowship: "Contratto di collaborazione per la realizzazione di pannelli espositivi relativi alla biologia evolutiva dei micromammiferi, con particolare riferimento alle metodologie di morfometria geometrica a favore del Dipartimento di Biologia Animale e dell'Uomo dell'Università degli Studi di Roma "La Sapienza". Progetto: L'Origine della specie: dall'Anatomia Comparata alle nuove frontiere della Biologia Evolutiva. Responsabile: prof.ssa Luciana Sola."
10-4-2013	10-5-2013	Sciences Department, Roma Tre University.	Fellowship: "Analisi craniometriche di micromammiferi (Chiroptera) attraverso raccolta ed elaborazione di dati tridimensionali".
15-09-2000	15-09-2002	Parco della Caffarella, Roma	Naturalistic and archeologic guide of Natural Park "La Caffarella" in the context of regional Park "Appia Antica".
30-4-2002	30-4-2004	Former Geological Sciences Department, Roma Tre University.	Research collaborator in a project for the analysis of climatic changes in the last 250000 years proposed at the University and Technology Research Ministry by palaeontologists of Ferrara, Messina, Pisa, Roma " La Sapienza ", Roma Tre and Torino University under coordination of Prof. A. Kotsakis.

1-01-2009	22-03-2016	Former Geological Sciences Department, Roma Tre University.	Research Collaborator at Science Department, Roma Tre University.

Part IV – Teaching experience

Year	Institution	Lecture/Course
2001-2003	"Diaz" and "Augusto" High School, Rome	Complementary modules of Botany and Geology as official guide of Natural Park "La Caffarella" at the "Diaz" and "Augusto" High School, Rome
2009-2010	Former Geological Sciences Department, Roma Tre University	Lecturer on Evolutionary Theory in the context of Paleontology course at former Geological Sciences Department, Roma Tre University.
2010-2011	Former Geological Sciences Department, Roma Tre University	Lecturer on Evolutionary Theory in the context of Paleontology course at former Geological Sciences Department, Roma Tre University.
2011-2012	Former Geological Sciences Department, Roma Tre University	Lecturer on Evolutionary Theory in the context of Paleontology course at former Geological Sciences Department, Roma Tre University.
25-27/2/2013	Sciences Department, Roma Tre University.	"Corso base di R per scienze biologiche ed ambientali". Sciences Department, Roma Tre University.
7-17/4/2014	Sciences Department, Roma Tre University.	"Corso base di R per scienze biologiche ed ambientali". Sciences Department, Roma Tre University.
22-27/02/2015	Perugia University	Introduction to Biostatistics". Scuola di Palantropologia 2015. 22/02/2015 - 27/02/2015, Perugia.
4-8/5/2015	Dipartimento di Matematica e Fisica, Università Roma Tre, Rome, Italy.	"R-The free software for Statistical Computing". LAMS course hosted by Dipartimento di Matematica e Fisica, Università Roma Tre, Rome, Italy.
6-27/2/2018	Sciences Department, Roma Tre University, Rome, Italy.	"Corso base di R per scienze biologiche ed ambientali". Sciences Department, Roma Tre University, Rome, Italy.
5-14/3/2018	Dipartimento di Scienze della Terra dell'Ambiente e delle Risorse, Università Federico II, Napoli, Italy.	"Geostatistical Analysis in R". Dipartimento di Scienze della Terra dell'Ambiente e delle Risorse, Università Federico II, Napoli, Italy.

Part V - Society memberberships, Awards and Honors

Year	Title
27-2-2005/12-3-2005:	SYNTHESYS GRANT WINNER for visiting the London Museum of Natural History.
21-3-2005/1-4-2005	SYNTHESYS GRANT WINNER for visiting the Institut Royal des Sciences Naturelles, Bruxelles.
25-4-2005/6-5-2005	SYNTHESYS GRANT WINNER for visiting the Museum National d'Histoire Naturelle, Paris

Part VI – Research Activities

I

Keywords	Brief Description
Systematics Evolutionary Paleobiology Biomechanics Biochronology Shape theory	**1) Paleontology**
	- *Systematics:* my main group is represented by Crocodylia. I faced systematics problems using both cladistics and Geometric Morphometrics. I obtained my Ph.D. on geometric morphometrics of recent and fossil crocodiles. Ever since I published several papers about systematics and biogeography of both eusuchian and non-eusuchian taxa from Mesozoic and Cenozoic. More recently I expanded my interests to other groups given that the same methods (cladistics and Geometric Morphometrics) can be applied to a wide range of taxa. In particular, I worked on systematics of Dinosauria, Talpoidea and Rhinocerotidae.
	- *Paleobiogeography:* phylogenetic systematics results for Crocodylia have been used for paleobiogeographic inference of Italian Cenozoic crocodilians and for Tomistominae. More recently a full re-assessment of Monteviale fauna (Veneto, Italy) has been published with more details about vertebrate species present in this lignite-bearing deposits.
	- *Evolutionary Paleobiology:* I explored macroevolutionary dynamics in various groups of Vertebrates: Crocodylia, Artiodactyla and in recent years dinosaurs, micro-mammals and other macro-mammals. I deepened the debate about speciation theories and the connections between evolutionary theories and ecological approaches (i.e. punctuated equilibria [Eldredge & Gould] such as effect and pulse hypotheses). Recently, I explored the relationships between shape, function and phylogeny by applying new comparative methods and the relationships between modularity, adaptation and ontogeny by using Geometric Morphometrics.
	- *Biomechanics:* I applied the well-known method of Finite Element Analysis and other mechanical approaches in order to unveil the relationships between shape and biomechanical performance of biological structures. This is achieved by proper handling of biomedical images for surfaces and volumes reconstructions. This has been applied to crocodiles, Talpidae and to the extinct enigmatic fossorial Proscalopidae Mesoscalops

montanensis. I combined these approaches with appropriate phylogenetic comparative methods able to discover patterns of convergence/parallelism/divergence among different clades.
- *Biochronology:* tempo and mode of phenotypic evolution are often used, when dealing with fossil vertebrates, in order to evaluate the evolution of specific faunas and of their environments. I applied modern statistical approaches (i.e. bootstrapped cluster analysis) in order to explore the biochronological relationships among both Italian and European faunas of macro-mammals aiming at building ecologically-based paleo-communities.
- *Riemannian connections and metrics:* Together with other colleagues I expanded some aspects of the mathematics behind the technique of Geometric Morphometrics by proposing new connections in the Riemannian manifold for landmark based shape analysis. This is particular useful for "transporting deformations" toward a "mannequin" shape in presence of multi-group transformation series such as multiple ontogenetic trajectories.
2) Translation to Medicine, especially Cardiology
- *Cardiac mechanics:* Starting from 2013 the quantitative techniques I used for paleobiological investigations have been also successfully applied to clinics, in particular Cardiology, in order to explore the mechanics of human heart by comparing healthy subjects with specific pathological conditions. This is pursued by using three-dimensional Speckle Tracking Echocardiography (STE). This allows handling 3D geometries of beating human heart thus moving in time. Coupling the concept of anatomical homology with that of temporal-electromechanical homology it has been possible shaping the motion of human heart and finding new potential indicators of incumbent pathology.
- *Epidemiology:* many epidemiological studies look for risks of occurrences of specific (often fatal) events. This aim is often pursued by using classical Cox-models and Kaplan-Meyer curves. However, a fatal event can occur as a consequence of another cause that is in competition with the primary cause. A proper application of competing risk regression has been successfully applied to Coronary Heart Disease in a 50 years follow-up as well as a more specific pairwise comparison with other competing causes of death.
3) Center of Evolutionary Ecology
I am the founder of the Center of Evolutionary Ecology that comprising the former Geological Sciences Department at Roma Tre University and STAT Department at University of Molise. This structure aimed at studying the evolutionary process from a multidisciplinary point of view: from Paleobiology to zoology, from botany to molecular biology. Only an integrated study of evolutionary phenomena can unveil their underlying mechanisms that of course result from the interplay of phylogeny, form, function and molecular evolution.

II

ACADEMIC EDITOR

PlosOne: 3/6/2017-Present

Symmetry: 13/1/2021-Present

REVIEWER ACTIVITY

Journal of Vertebrate Paleontology

Evolution

BMC Evolutionary Biology

Zoological Journal of the Linnean Society

Journal of Morphology

Biological Journal of the Linnean Society

Comptes Rendus Biologie

Atti della Società Paleontologica Italiana

Mammalian Biology

Scientific Report

Evolutionary Ecology Research

American Journal of Physical Anthropology

Geological Magazine

PlosOne

Anatomical Record

Journal of Archaeological Science

Rivista Italiana di Paleontologia e Stratigrafia

III
CO-TUTOR MASTER DEGREE THESIS

Academic year 2005/2006. LUCCI Federico. “La morfometria geometrica in 2d applicata alla mandibola di Grandi Felidi attuali e del Plio-Pleistocene europeo”, former Dipartimento di Scienze Geologiche (now Dpartimento di Scienze), Università Roma Tre.

Academic year 2007/2008. MAIORINO Leonardo. "Geometric Morphometrics Analysis in 2-dimensions applied to Skulls and Mandibles of Plio-Pleistocene Rhinoceroses of Europe", former Dipartimento di Scienze Geologiche (now DIipartimento di Scienze), Università Roma Tre.

Academic year 2015/2016. SPANI Federica. “Heterochely in Brachiyurans: a Geometric Morphometrics approach”, Dipartimento di Scienze, Università Roma Tre.

CO-TUTOR Ph.D THESIS

MAIORINO Leonardo (2014) XXVI ciclo – "Macroevolutionary pattern of Ceratopsia (Dinosauria, Ornithischia) and biomechanics: an integrated approach by means of Geometric Morphometrics and Finite Element Analysis", former Dipartimento di Scienze Geologiche (now Dipartimento di Scienze), Università Roma Tre.

SANSALONE Gabriele (2015) XXVII ciclo – "Systematics and evolutionary dynamics within Talpidae (Mammalia): phylogeny and functional morphology", former Dipartimento di Scienze Geologiche (now Dipartimento di Scienze), Università Roma Tre.

PANDOLFI Luca (2015) XXVII ciclo – "Systematics and evolution of Rhinocerotini", former Dipartimento di Scienze Geologiche (now Dipartimento di Scienze), Università Roma Tre.

ORGANIZED WORKSHOPS

- I have been the **organizer** of the Geometric Morphometrics Laboratory for Systematics and Evolutionary Researches hosted by STAT Dept., Molise University, Isernia, 1-5/2/2010.

ATTENDED WORKSHOPS

- I Workshop on geometric morphometrics at Museu de Ciencias Naturales Facultad de Ciencias Unversidade de Lisboa; 6,7,10-5-2004.

- Mechanics in Biology Workshop @ GSSI - Gran Sasso Science Institute May, 6~9, 2014 L'Aquila, Italy.

- Biomat 2014. Stefan Banach International Mathematical Center/Institute of Mathematics/Polish Academy of Sciences, Bedlewo, near Poznan, Poland, November, 02 - 08, 2014.

- Scuola di Paleoantropologia 2015. 22/02/2015 -27/02/2015 Perugia.

CONGRESS

VI European Workshop on Vertebrate Paleontology, 19-22/09/2001, Florence-Montevarchi.

IV Italian Congress of Herpetology, 18–21/06/2002. Organised by Societas Herpetologica Italica (S.H.I.).

VI Congresso della Societas Herpetologica Italica, 27/09-01/10/2006

MICCAI 2015. October 2015; Shape Classification challenge: Myocardial Infarction Recognition. Munich, Germany.

VipImage2017: **Organizer of the thematic session** "Shape analysis in medical imaging: from math to clinics". 18-20/10/2017.

INVITED CONFERENCES

1. I coccodrilli italiani. 3-4-2003. Museo Civico di Zoologia, Roma.
2. I grandi mammiferi del plio-pleistocene italiano: un approccio macroevolutivo. 17-2-2005 - Museo Civico di Zoologia, Roma.
3. La paleobiologia evolutiva: casi studio. 12-2-2009 - Museo Civico di Zoologia, Roma.

4. Shaping the shape changes: statistical motion analysis for soft matter. Mechanics in Biology Workshop @ GSSI - Gran Sasso Science Institute May, 6~9/5/ 2014 L'Aquila, Italy.
5. La meccanica cardiaca e lo studio della forma: Special Session: "Dalla paleontologia alla medicina". Annual Meeting Istituto Italiano di Antropologia 11-13/12/2014.
6. 4D Cardiac mechanics and shape analysis: from basic research to clinics. Ambulatorio di Cardiologia, Padiglione San Luca Vecchio, Ospedale Careggi, 22/11/2017.
7. Moderni metodi di analisi delle traiettorie ontogenetiche in Antropologia. "Darwin day 2018: Il posto dell'Uomo nella Scienza Moderna". Società dei Naturalisti, Napoli, 5-3-2018.

COMPUTER KNOWLEDGE

Operating systems:

Mac Os 8x, 9x;

Software: knowledge of principal applications for cladistic: PAUP (licensed), Maclade, Autodecay, Treeview, Treemap; knowledge of principal applications of video-editing spread-shift and database (Microsoft Office); pdf conversion.

Windows 9x, Windows NT, Windows 2000

Software: knowledge of principal applications of video-editing spread-shift and database (Microsoft Office); knowledge of principal applications for cladistic for Windows platform: Hennig 86, TreeGardener, Winclada, Peewee, Nona; pdf conversion. Very good knowledge of statistical packages SPSS, STATISTICA, NTSYS and *R*.

Biostatistics with R

I evaluate in R any data analysis needed for my work.

From official website: "R is a language and environment for statistical computing and graphics. It is a GNU project which is similar to the S language and environment which was developed at Bell Laboratories (formerly AT&T, now Lucent Technologies) by John Chambers and colleagues. R can be considered as a different implementation of S. There are some important differences, but much code written for S runs unaltered under R. R provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering, ...) and graphical techniques, and is highly extensible. The S language is often the vehicle of choice for research in statistical methodology, and R provides an Open Source route to participation in that activity.One of R's strengths is the ease with which well-designed publication-quality plots can be produced, including mathematical symbols and formulae where needed. Great care has been taken over the defaults for the minor design choices in graphics, but the user retains full control." Good R programming mainly for multiple-multivariate linear model based inferences: GLS, GLM and basic likelihood methods. Multivariate data analysis: Exploratory: PCA, MDS, Principal Coordinates, Discriminant Analysis. Inferential: ANOVA, MANOVA. Non parametric ANOVA and MANOVA based on permutations. Distance-matrices based non parametric regression. Methods for handling data non independence: spatial, temporal and phylogenetic non independence: GLS, Variation Partitioning. Temporal series: testing directional trend or random walk in time ordered measured traits. Geometric morphometrics tools for handling two- and three-dimensional data. Comparative methods for analysing phylogenetically structured data. Classification problems and classification performance evaluation applied to clinics.

Three-Dimensional Data Analysis

Good knowledge of main commercial and non-commercial software for handling biomedical images (i.e. DICOM files) in order to manage and build surface and volumes to be analyzed for Finite Element Modelling.

Part VII – Summary of Scientific Achievements

Product type	Number	Data Base	Start	End
Total products indexed in ***Scopus***	81	***Scopus***	July-2004	Feb 2021
Papers [indexed and with Impact Factor]	76	***Scopus***	July-2004	Feb 2021
Contribution in Books or Special Volumes [indexed in ***Scopus***]	5	***Scopus***	July-2004	Feb 2021
Papers [not indexed and without Impact Factor]	5	***Not applicable***	July-2004	Feb 2021

Academic seniority: 16.58 years. It was calculated as the time span (in months) between the first record in Scopus (July-2004) and the current Date (February 2021) [thus **not** the last record in Scopus] divided by 12.

Impact Factors are reported according to **InCites Journal Citation Reports**

Total Impact factor	229.509
Impact factor Range	0.394 - 11.541
Impact factor mean	3.02
Impact factor median	2.38
Total Citations	1286
Average Citations per Product	15.88
Total number of citing documents	877
Hirsch (H) index	23
Hirsch (H) index excluding self-citations	20
Normalized H index*	1.39

*H index divided by the academic seniority.

Part VIII– Selected Publications

List of the **12** publications selected for the evaluation. For each publication report title, authors, reference data, journal IF (if applicable), citations, press/media release (if any). Impact factors are taken from InCites Journal Citation Reports; Citations are taken from *Scopus* database.

1) Raia P., **Piras P.** & Kotsakis T. (2006) - Detection of Plio-Quaternary large mammal communities of Italy: integration to biochronology. *Quaternary Science Reviews*, 25: 846-854. IF: 4.113. Citations: 24.

2) **Piras P.**, Marcolini F., Raia P., Curcio M.T. & Kotsakis T. (2009) - Testing evolutionary stasis and trends in first lower molar shape of extinct Italian populations of *Terricola savii* (Arvicolidae, Rodentia) by means of geometric morphometrics. *Journal of Evolutionary Biology*, 22: 179-191. IF: 3.816. Citations: 23.

3) Raia P., Carotenuto F., Meloro C., **Piras P**. & Pushkina D. (2010) - The shape of contention. Adaptation, history, and contingency in ungulate mandibles. *Evolution*, 64: 1489–1503. IF: 5.659. Citations: 66.

4) Buscalioni A.D., **Piras P**., Signore M., Vullo, R. & Barbera C. (2011) - Early Eusuchia Crocodylomorpha from the vertebrate-rich plattenkalk of Pietraroia (lower Albian, Southern Apennines, Italy). *Zoological Journal of the Linnean Society*, 163: S199–S227. IF: 2.433. Citations: 45.

5) **Piras P.,** Sansalone G., Teresi L., Kotsakis T., Colangelo P. & Loy A. (2012) - Testing convergent and parallel adaptations of talpids humerus mechanical performance by means of Geometric Morphometrics and Finite Element Analysis. *Journal of Morphology*, 273: 696-711. IF: 1.602. Citations: 37.

6) **Piras P.**, Maiorino L., Teresi L., Meloro C., Raia P., Lucci F. & Kotsakis T. (2013) - Bite of the Cats: Relationships between functional integration and mechanical performance as revealed by mandible geometry. *Systematic Biology*, 62:878–900. IF: 11.532. Citations: 52.

7) **Piras P.,** Sansalone G., Teresi L., Moscato M., Profico A., Eng R., Cox T. C., Loy A., Colangelo P. & Kotsakis T. (2015) - Digging adaptation in insectivorous subterranean eutherians. The enigma of *Mesoscalops montanensis* unveiled by geometric morphometrics and finite element analysis. *Journal of Morphology*, 276: 1157–1171. IF: 1.521. Citations: 22.

8) Pandolfi L., Carnevale G., Costeur L., Del Favero L., Fornsaiero L., Ghezzo E., Maiorino L., Mietto P., **Piras P.**, Rook L., Sansalone G. & Kotsakis T. (2017). Reassessing the earliest Oligocene vertebrate assemblage of Monteviale (Vicenza, Italy). *Journal of Systematic Palaeontology*, 15:83-127. doi:http://dx.doi.org/10.1080/14772019.2016.1147170. IF: 2.326. Citations: 11.

9) Sansalone G., Kotsakis T., Schwermann A.H., Van den Hoek Ostende L.W., **Piras P.** (2018). When moles became diggers. *Tegulariscaptor* gen. nov. and the evolution of talpid fossoriality. *Journal of Systematic Palaeontology*, 16, 8, 645–657 doi: 10.1080/14772019.2017.1329235. IF: 2.315. Citations: 3.

10) **Piras P**., Silvestro D., Carotenuto, F., Castiglione S., Kotsakis T., Maiorino L., Melchionna M., Mondanaro A., Sansalone G., Serio C., Vero V.A., Raia P. (2018). Evolution of the sabertooth mandible: a deadly ecomorphological specialization. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 496: 166-174. https://doi.org/10.1016/j.palaeo.2018.01.034 IF: 2.616. Citations: 10.

11) Silvestro D., Castiglione S., Mondanaro A., Serio C., Melchionna M., **Piras, P.**, Di Febbraro M., Carotenuto, F., Rook, L. and Raia, P. (2020).A 450 million years long latitudinal gradient in age-dependent extinction. *Ecology Letters*, 23: 439-446. doi:10.1111/ele.13441 IF: 8.665. Citations: 4.

12) **Piras P.**, Profico A., Pandolfi L., Raia P., Di Vincenzo F., Mondanaro A., Castiglione S., Varano V. (2020). Current options for visualization of local deformation in modern shape analysis applied to paleobiological case studies. *Frontiers in Earth Science*, 8:66. doi: 10.3389/feart.2020.00066 IF: 2.689. Citations: 2.

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