VIII Jornades de BioRecerca
Facultat de Biociències
13-16 juny 2023

Facultat Biociències UAB

13 de Juny **Bioquímica i Biologia Molecular**

Conferència d'Inauguració BioJornades
12:00 Sala d'Actes

14 de Juny **Genètica i Microbiologia**

15 de Juny **Biologia Cel·lular, Fisiologia i Immunologia**

16 de Juny **Biologia Animal, Biologia Vegetal i Ecologia**

Conferència de Cloenda BioJornades
12:00 Sala d'Actes

UAB
Universitat Autònoma de Barcelona

16 de Juny de 2023

VIII JORNADA CIENTÍFICA DEL DEPARTAMENT DE BIOLOGIA ANIMAL, BIOLOGIA VEGETAL i ECOLOGIA

9.15	**Inauguració i presentació**	**Dr. Isidre Gibert** - Degà de la Facultat de Biociències **Dr. Benet Gunsé** – Director del Departament
9:30	**Primera sessió d'exposicions orals**	Moderació: Dra. Anna Soler
9:30	**Analysis of Ballistic Trauma in Human Long Bones**	**Nathalie Corinne Schwab** *Doctorat de Biodiversitat*
9:45	**Repeatedly Northwards and Upwards: Southern African Grasslands Fuel the Colonization of the African Sky Islands in *Helichrysum* (Compositae)**	**Carme Blanco Gavaldà** *Doctorat de Biologia i Biotecnologia Vegetal*
10:00	**Revolutionizing Long-term Wildlife Monitoring: Automated nest Surveillance using Continuous Recording and Deep-Learning**	**Marçal Pou Rossell** *Doctorat d'Ecologia Terrestre*
10:15	**Estudio de aislados silvestres del género *Pleurotus* y sus potenciales en sistemas de cultivos cíclicos**	**Luis Antonio Riofrío Riofrío** *Doctorat de Biologia i Biotecnologia Vegetal*
10:30	**Interacción de los nematodos entomopatógenos con compuestos bioactivos de extractos vegetales**	**Marina Seco de Herrera García-Plaza** *Màster d'Ecologia Terrestre i Gestió de la Biodiversitat*
10:45	**Presentació ràpida de pòsters**	Moderació: Dra. Anna Soler
11:15	**Sessió de pòsters**	**Coffee-break**
12.00	**Conferència Clausura VIII Biojornades UABio**	**Dr. Assumció Malgosa** -Vicerrectora de Recerca **Dr. Isidre Gibert** -Degà Facultat de Biociències **Dr. Bent Gunsé** - Director del Departament Presentació del conferenciant: Dr. Jordi Martínez Vilalta Sala d'Actes Facultat de Biociències
	Leveraging plant physiology and ecology to understand the impacts of climate change on Earth's forests	**Prof. William R. L. Anderegg** *University of Utah*
13:00	**Segona sessió d'exposicions orals**	Moderació: Dra. Cristina Roquet
13:00	**Anàlisi de la complexitat d'un mostreig per a l'estudi de la mobilitat humana: Els isòtops d'estronci a Ullastret i Puig Castellar**	**Rubén de la Fuente Seoane** *Doctorat de Biodiversitat*
13:15	**Cardos de montaña africanos: problemas de delimitación genérica analizados con NGS**	**Lucía Daniela Moreyra Coluccio** *Doctorat de Biologia i Biotecnologia Vegetal*
13.30	**Fi sessió matinal**	
15.00	**Tercera sessió d'exposicions orals**	Moderació: Dra. Silvia Busoms
15.00	**Las contribuciones de la naturaleza de la Tierra a las personas (NCP) y la biodiversidad en la conservación de los bosques peruanos**	**Maricel Jadith Móstiga Rodriguez** *Doctorat d'Ecologia Terrestre*
15.15	**Neutral and alkaline-salinity stress management through autochthonous PGPB from rhizosphere microbiome of *Brassica fruticulosa* : Metabolic screening and plant interaction study on *Sinapis alba* L.**	**Glòria Escolà Oliva** *Doctorat de Biologia i Biotecnologia Vegetal*
15.30	**Manipulació per part materna del destí de castes en la formiga erràtica *Tapinoma darioi***	**Daniel Altair Saureu Velasco** *Màster d'Ecologia Terrestre i Gestió de la Biodiversitat*
15.45	**Reconstructing inflammatory phenotypes using osteological markers in medieval populations from Barcelona, Spain**	**Laura Pallarés Viña** *Màster d'Antropologia Biològica*
16:00	**Descans**	
16.15	**Beyond plant awareness disparity: intangible knowledge as a way of fostering our connection with nature**	**Joaquim Querol Mercadé** *Màster d'Estudis interdisc. en sostenibilitat Econ., Global i Social*
16.30	**Integrated study on the natural variation in *Arabidopsis thaliana* responses to alkaline salinity**	**Maria Almira Casellas** *Doctorat de Biologia i Biotecnologia Vegetal*
16.45	**Diving into fish pathology: The case of *Merluccius merluccius* from the Catalan coast (NW Mediterranean Sea).**	**Laura Muns Pujadas** *Doctorat d'Aqüicultura*
17.00	**Coffee-break**	
17.30	**Acte de cloenda**	**Dra. Virgina Luzón** - Vicerectora de Comunicació i Cultura **Dr. Isidre Gibert** - Degà de la Facultat de Biociències **Dr. Benet Gunsé** - Director del Departament
	Entrega de Premis a les millors participacions a la Jornada Científica **Entrega de Premis del concurs de fotografia ExpoNatura UAB 2023**	

PATROCINADORS

VIII Jornades Departament de Biologia Animal, Biologia Vegetal i Ecologia

transmitting science

SARSTEDT

FOXEN Systems, S.L.

NRDmultimedia

grupCIF
Central Industrial del Fred CIF s.l.

tower tba
www.towertba.com

Aisamar

grup
SUMINISTRO INTEGRAL PARA LA OFICINA

EXPOSICIONS ORALS

The definition of cortical fracture patterns in ballistic long bone trauma

Nathalie Schwab (1), Xavier Jordana (1,2), Ignasi Galtés (1,2,3)

(1) Departament de Biologia Animal, Biologia Vegetal i Ecologia (BABVE), Universitat Autònoma de Barcelona (UAB)

(2) Research Group of Biological Anthropology (GREAB), Biological Anthropology Unit, BABVE Department, Universitat Autònoma de Barcelona (UAB)

(3) Forensic Anthropology Unit, Catalonian Institute of Legal Medicine and Forensic Science (IMLCFC)

When dealing with badly preserved cadavers or skeletal human remains, the assessment of death circumstances remains a major challenge. In case forensic evidence cannot be taken from the skin and soft tissue, the information may only be deduced from more resistant elements such as bone. Whereas cranial gunshot injuries have been well studied, reliable data on fracture patterns in ballistic long bone trauma remains scarce. The aim of this experimental study is to define the ballistic fracture characteristics in human long bones. 10 femurs and 10 humeri from body donors were dissected down to the periosteum, embedded in ballistic gelatine and fixed upright. Fractures were produced by a 9 mm Luger full metal jacket bullet with an impact velocity of 360 m/s. At a distance of 2 m, the bullet was fired perpendicularly to the middle of the anterior aspect of the shaft. The fractures were reconstructed and examined macroscopically. All samples presented comminuted fracture with a stellate or spiderweb-like pattern at the impact side. The cortical characteristics could be divided into entrance, exit and general traits. The results provide guidelines for the identification and reconstruction of gunshot trauma in long bones. They may be of great value for forensic medical examinations and forensic humanitarian actions such as the examination of war graves.

Repeatedly Northwards and Upwards: Southern African Grasslands Fuel the Colonization of the African Sky Islands in *Helichrysum* (Compositae)

Carme Blanco-Gavaldà (1), Mercè Galbany-Casals (1), Alfonso Susanna (2), Santiago Andrés-Sánchez (3), Randall J. Bayer (4), Christian Brochmann (5), Glynis V. Cron (6), Nicola G. Bergh (7), Núria Garcia-Jacas (2,†), Abel Gizaw (5,8), Martha Kandziora (9), Filip Kolár (9,10), Javier López-Alvarado (1), Frederik Leliaert (11), Rokiman Letsara (12), Lucía D. Moreyra (2), Sylvain G. Razafimandimbison (13), Roswitha Schmickl (9,10) Cristina Roquet (1).

(1) Systematics and Evolution of Vascular Plants—Associated Unit to CSIC by IBB, Department of Animal Biology, Plant Biology and Ecology, Faculty of Biosciences, Autonomous University of Barcelona, ES-08193 Bellaterra, Spain.

(2) Botanic Institute of Barcelona (IBB), CSIC-Ajuntament de Barcelona, Pg. Migdia s/n, ES-08038 Barcelona, Spain.

(3) Department of Botany and Plant Physiology and Plant DNA Biobank, DNA National Bank, University of Salamanca, Edificio I+D+i, Espejo St., ES-37007 Salamanca, Spain.

(4) Department of Biological Sciences, Center for Biodiversity, University of Memphis, Memphis, TN 38152, USA.

(5) Natural History Museum, University of Oslo, P.O. Box 1172, NO-0318 Oslo, Norway

(6) School of Animal, Plant and Environmental Sciences, University of the Witwatersrand, Private Bag 3, Johannesburg 2050, South Africa.

(7) Foundational Biodiversity Science, Kirstenbosch Research Centre, South African National Biodiversity Institute, Private Bag X7, Newlands, Cape Town 7735, South Africa.

(8) Department of Plant Biology and Biodiversity Management, Addis Ababa University,

Addis Ababa P.O. Box 3434, Ethiopia.

(9) Department of Botany, Faculty of Science, Charles University in Prague, Benátská 2, CZ-12801 Prague, Czech Republic.

(10) Institute of Botany, Academy of Sciences of the Czech Republic, CZ-25243 Pruhonice, Czech Republic.

(11) Meise Botanic Garden, Nieuwelaan 38, BE-1860 Meise, Belgium.

(12) Herbarium of the Parc Botanique et Zoologique of Tsimbazaza (PBZT), Antananarivo 3G9G+V6C, Madagascar.

(13) Department of Botany, Swedish Museum of Natural History, P.O. Box 50007, SE-104 05 Stockholm, Sweden.

The Afromontane and Afroalpine areas constitute some of the main biodiversity hotspots of Africa. They are particularly rich in plant endemics, but the biogeographic origins and evolutionary processes leading to this outstanding diversity are poorly understood. We

performed phylogenomic and biogeographic analyses of one of the most species-rich plant genera in these mountains, *Helichrysum* (Compositae-Gnaphalieae). Most previous studies have focused on Afroalpine elements of Eurasian origin, and the southern African origin of Helichrysum provides an interesting counterexample. We obtained a comprehensive nuclear dataset from 304 species (50% of the genus) using target-enrichment with the Compositae1061 probe set. Summary-coalescent and concatenation approaches combined with paralog recovery yielded congruent, well-resolved phylogenies. Ancestral range estimations revealed that Helichrysum originated in arid southern Africa, whereas the southern African grasslands were the source of most lineages that dispersed within and outside Africa. Colonization of the tropical Afromontane and Afroalpine areas occurred repeatedly throughout the Miocene–Pliocene. This timing coincides with mountain uplift and the onset of glacial cycles, which together may have facilitated both speciation and intermountain gene flow, contributing to the evolution of the Afroalpine flora.

Revolutionizing Long-term Wildlife Monitoring: Automated nest Surveillance using Continuous Recording and Deep-Learning

Marçal Pou (1), Jolle W Jolles (1, 2)

(1) Centre de Recerca Ecològica i Aplicacions Forestals (CREAF)

(2) Centre d'Estudis Avançats de Blanes (CEAB-CSIC)

Measuring parental care and social behaviour in the wild is crucial but challenging, often requiring direct observations that can be invasive and prone to error. However, recent technological advancements in automated image-based tracking methods now offer unprecedented opportunities to quantify these behaviours more efficiently and accurately. Here, we present an automated camera-based monitoring system that uses Raspberry Pi micro-computers to collect high-quality information on parental care and social behaviour of animals breeding in nest-boxes or natural cavities. By using solar power, we are able to gather video and temperature data at a frequency of 1Hz for 24h/day during 6 months, allowing remote connectivity through internet and error logging at any time. Combining this fully automated recording system with novel deep-learning approaches such as YOLO-v8 model makes it possible to extract large amounts of data in an efficient and automated way from a wide range of parental care behaviours, including the timing of reproductive stages, sex-specific parental roles, pair coordination, nestbuilding efficiency, nocturnal activity and chick behaviour. In colonies, the system can also provide insights into the fitness benefits of social connections. We will present results regarding the precise daily timing and investment of parental behaviour across the breeding season for 14 pairs of jackdaws (*Coloeus monedula*) and its link to reproductive success. Our results suggest that the automated camera-based monitoring system can measure parental care with high accuracy and enhance our understanding of its connection to fitness. We encourage researchers to adopt similar systems for their long-term studies.

Estudio de aislados silvestres del género *Pleurotus* y sus potenciales en sistemas de cultivos cíclicos.

Luis Antonio Riofrio (1), Soledad Martos (2), Eliana Bianucci (2)

(1) Programa de Doctorado de Biología y Biotecnología Vegetal, UAB
(2) Unidad de Fisiología Vegetal. UAB

Los hongos del género *Pleurotus* son saprófitos del orden de los Agaricales, cultivados a nivel mundial.

Objetivo general: Evaluar un modelo de economía circular cultivando *Pleurotus* sobre subproductos del cultivo de maíz.

Se recolectaron individuos silvestres de *Pleurotus*. Dos de las muestras colectadas en campo ("PQ" y "PCd") se cultivaron con éxito. La identificación de los aislados se realizó en base a caracteres morfológicos y mediante marcadores moleculares (ITS, EF1α y RPB2). Esto nos permitió identificar a ambos como *Pleurotus djamor*. A partir de esporas de PQ y PCd así como cepas comerciales obtuvimos cultivos monospóricos para la obtención de híbridos. Se midió la velocidad de crecimiento micelial, in vitro y en grano de maíz, de los aislados silvestres, aislados comerciales y los híbridos que obtuvimos. Seleccionamos al aislado PQ para estudiar su compatibilidad con bacterias PGPB y tolerancia a arsénico (As). Se evidenció compatibilidad hongo/bacteria; y de alta tolerancia a As

Interacción de nematodos entomopatógenos con compuestos bioactivos de extractos vegetales

Marina Seco de Herrera, Fernando García del Pino.

Departament de Biologia Animal, Biologia Vegetal i Ecologia (BABVE), Universitat Autònoma de Barcelona (UAB).

Con diversos experimentos se pretende observar el efecto de algunos compuestos naturales bioactivos (aceites esenciales de *Mentha*, *Allium* y *Satureja* y una quitinasa) sobre la supervivencia e infectividad de tres especies de nematodos entomopatógenos. Observando los efectos letal, fumigante y subletal de estos compuestos sobre los NEPs podrá servir para una futura investigación de nuevos métodos de control de plagas más sostenibles para el medio ambiente.

Anàlisi de la complexitat d'un mostreig per a l'estudi de la mobilitat humana: Els isòtops d'estronci a Ullastret i Puig Castellar

Rubén de la Fuente-Seoane, M. Eulàlia Subirà

Unitat d'Antropologia Biològica, Departament BABVE, Facultat de Biociències, Universitat Autònoma de Barcelona, 08193 Bellaterra, España. Ruben-delafuente@uab.cat; Eulalia.subira@uab.cat

L'estronci conté diferents isòtops estables (^{84}Sr, ^{86}Sr, ^{87}Sr) dels quals un, el ^{87}Sr, es genera en diferents abundàncies depenent de l'edat de la roca i de la seva composició. Això es tradueix en que cada localització tindrà una "petjada" isotòpica diferent. Atès que l'estronci biodisponible es transfereix des del sòl a la vegetació i als animals a través de la cadena tròfica, aquesta metodologia ens permet establir patrons de mobilitat geogràfica en poblacions antigues. En el cas que desenvolupem aquí, busquem aplicar aquestes anàlisis als caps enclavats ibers trobats als jaciments ibèrics de Puig Castellar (Barcelona) i Ullastret (Ullastret). En aquesta comunicació pretenem explicar com s'han establert les bases metodològiques i de planificació dels sondejos, així com presentar les 40 mostres de sediment i vegetació que es van recollir a fi de poder establir la ràtio isotòpica local de les zones objecte d'anàlisi.

Cardos de montaña africanos: problemas de delimitación genérica analizados con NGS

Lucía D. Moreyra (1), Núria Garcia-Jacas (1)†, Cristina Roquet (2), Jennifer R. Ackerfield (3), Turan Arabacı (4), Carme Blanco-Gavaldà (2), Christian Brochmann (5), Juan Antonio Calleja (6), Tuncay Dirmenci (7), Kazumi Fujikawa (8), Mercè Galbany-Casals (2), Tiangang Gao (9), Abel Gizaw (5, 10), Javier López-Alvarado (2), Iraj Mehregan (11), Roser Vilatersana (1), Bayram Yıldız (12), Frederik Leliaert (13), Alexey P. Seregin (14), Alfonso Susanna (1)

(1) Botanic Institute of Barcelona (IBB), CSIC-Ajuntament de Barcelona, Pg. Migdia, s.n., 08038 Barcelona, Spain

(2) Autonomous University of Barcelona, Systematics and Evolution of Vascular Plants (UAB) – Associated Unit to CSIC by IBB – Cerdanyola del Vallès, Spain.

(3) Department of Biology, Colorado State University, Fort Collins, Colorado 80523-1878, U.S.A.

(4) Department of Pharmaceutical Botany, Faculty of Pharmacy, Inönü University, Malatya, Türkiye

(5) Natural History Museum, University of Oslo, PO Box 1172 Blindern, NO-0318 Oslo, Norway

(6) Department of Biology, Autonomous University of Madrid, Madrid, Spain.

(7) Department of Biology, Faculty of Necatibey Education, Balıkesir University, 10145 Balıkesir, Türkiye

(8) Kochi Prefectural Makino Botanical Garden, 4200-6, Godaisan, Kochi 781-8125, Japan

(9) State Key Laboratory of Systematic and Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences, 100093, Beijing

(10) Department of Plant Biology and Biodiversity Management, Addis Ababa University, P. O. Box 3434 Addis Ababa, Ethiopia

(11) Department of Biology, Science and Research Branch, Islamic Azad University, Tehran, Iran

(12) Yenikale District, I_smail Cem Street, No. 35, Narlidere, Izmir, Türkiye

(13) Meise Botanic Garden, Nieuwelaan 38, 1860 Meise, Belgium

(14) Faculty of Biology, M. V. Lomonosov Moscow State University, Moscow, 119991, Russia

La subtribu Carduinae, que forma parte de la tribu Cardueae, contiene unas 600 especies que se encuentran principalmente en el hemisferio norte. El grupo *Carduus-Cirsium*, uno de los más grandes de la subtribu con unos 550 taxones, ha sido un grupo difícil de clasificar debido a las incoherencias morfológicas y a la falta de resolución molecular. En este estudio, secuenciamos 198 muestras representativas de todos los géneros de Carduinae utilizando un enfoque de enriquecimiento y captura, y analizamos más de mil loci ortólogos conservados utilizando un enfoque concatenado y de coalescencia. Los resultados mostraron que Carduinae es monofilético e identificamos varios géneros naturales dentro del grupo *Carduus-Cirsium*. Sin embargo, *Carduus* y *Cirsium* sólo eran monofiléticos si se excluían las especies africanas. Por lo tanto, proponemos una nueva clasificación que incluye tres géneros endémicos de las montañas de África Tropical del Este, *Afrocarduus*, *Afrocirsium* y *Nuriaea*.

Neutral and alkaline-salinity stress management through autochthonous PGPB from rhizosphere microbiome of *Brassica fruticulosa*: Metabolic screening and plant interaction study on *Sinapis alba* L.

Glòria Escolà, Ginevra Bellegrandi, Eliana Bianucci, Sílvia Busoms, Charlotte Poschenrieder

Plant Physiology Laboratory, Bioscience Faculty, Universitat Autònoma de Barcelona, C/de la Vall Moronta s/n, E-08193, Bellaterra, Spain

Brassica fruticulosa is a wild Brassica species of the Mediterranean coasts. We found inland and coastal populations with contrasting phenotypes in salinity and alkalinity tolerance.

From the isolation of rhizosphere microbiome of the salt-tolerant *B. fruticulosa*, the plant growth promoting mechanisms of 5 strains were analized (phosphate solubilization ability, siderophores production, indolacetic acid like molecules production and ACC deaminase activity, etc.), all exposed to neutral-salinity (salt) and alkaline-salinity (alksalt) stress. A plant-PGPB interaction assay were performed to determine the effects of their individual inoculation in *Sinapis alba* plants submitted to salt and alk-salt stress. Although the results showed some differences among the bacteria and the conditions, all of them were able to perform the mechanisms and promote the plant growth under both stresses. These findings provide knowledge of PGPBs useful for salt-sensitive species of high economic interest.

Manipulació per part materna del destí de castes en la formiga *Tapinoma darioi*

Daniel Altair Saureu Velasco, Ricardo Caliari Oliveira

Departament de Biologia Animal, Biologia Vegetal i Ecologia (BABVE), Universitat Autònoma de Barcelona (UAB)

En aquest treball he estudiat un dels nombrosos conflictes que apareixen en les societats d'insectes: el control que exerceixen les reines de la formiga *Tapinoma darioi* en el destí de castes de la seva descendència. En la gran majoria d'espècies, aquest conflicte es resol gràcies al requeriment de rebre una alimentació diferencial. Tot i així, en el cas d'aquesta formiga, aquest destí pot ser influenciat per part materna mitjançant un increment en la quantitat d'hormona juvenil que es transmet als ous. Per avaluar-ho, s'han inoculat diverses reines amb una molècula isòmera de l'hormona juvenil, i altres amb una molècula antagonista. Els resultats que s'esperen obtenir són que les reines tractades amb l'isòmer d'hormona juvenil produeixin una descendència majoritàriament destinada a ser reines, i que les reines tractades amb la molècula antagònica generin una descendència majoritàriament obrera, evidenciant així el control matern en el destí de castes de la descendència en aquesta espècie.

Reconstructing inflammatory phenotypes using osteological markers in medieval populations from Barcelona, Catalunya, Spain

Laura Pallarés Viña (1), Laura Castells Navarro (2), Laura Canales Bartra (1), Fabian Crespo (3), Núria Armentano Oller (1)

(1) Departament de Biologia Animal, Biologia Vegetal i Ecologia (BABVE), Universitat Autònoma de Barcelona (UAB)

(2) Department of Archaeology, University of York, UK

(3) Department of Anthropology and Center for Archaeology and Cultural Heritage, University of Louisville, US

Recent research has shown that chronic infections and stressors can produce systemic inflammation which can contribute to the development and severity of local inflammatory processes. This phenomenon, influenced by context and the individual's immunological phenotype, can be studied in deceased individuals or past populations, through skeletal lesions such as periodontitis (PD) and periosteal lesions (PL). The aim of this study is to evaluate the severity and potential association of PD - using the cemento-enamel-alveolar crest distance (CEJ-AP) and Kerr index - and PL as inflammatory markers that can be used to reconstruct chronic skeletal inflammatory phenotypes. Biological sex, age, burial type (individual, double and multiple graves), and burial location as a proxy for social status, are analyzed to help reconstruct skeletal inflammatory phenotypes in adult individuals (n=59) from two medieval populations from Barcelona, Spain: Santa Maria de Besora (n=29; females=14, males=15; 11th-18th centuries); and Cal Pa i Figues (n=30; females=18, males=12; 14th century).

Results show, as expected, that CEJ-AC distances increased with age in both populations. Interestingly, in the population from Santa Maria de Besora, CEJ-AC distances were significantly larger in males than in females (p=0.040), and in individuals buried inside the church than in the cemetery (p=0.030). In contrast, the severity of PL was not significantly different between the groups studied. While no association was found between PD and PL in the analyzed population from Santa Maria de Besora (p=0.624), the medieval population from Cal Pa i Figues showed a significant association (p=0.020) between the severity of PD and the severity of PL. This data show that similar PD severities in different populations could be linked to different outcomes in systemic inflammation. This thesis briefly explores how different comorbidities, social, and environmental factors could have influenced the immune competence of ancient populations.

Beyond plant awareness disparity: intangible knowledge as a way of fostering our connection with nature

Joaquim Querol (2), Álvaro Fernández-Llamazares (1,2), Sandrine Gallois (2)

(1) Departament de Biologia Animal, Biologia Vegetal i Ecologia

(2) Institut de Ciència i Tecnología Ambiental (ICTA)

Our rigorous scientific investigation delves into the intricate phenomenon of plant awareness disparity (PAD. By integrating disciplines such as ecology, anthropology, education, and psychology, our cross-disciplinary study explores the multifaceted dimensions of PAD and its interplay with intangible knowledge systems. Situated in the captivating Valley of Camprodon, we meticulously assess PAD levels using the PAD-I Index, aiming to uncover potential interactions between people and their environment through exploring potential variables that go beyond formal knowledge. Through interviews, we delve into the intangible relationships between rural inhabitants and their natural environment, shedding light on the cultural practices, emotional connections, and traditional knowledge systems that shape human perceptions of plants. Our research holds promise for informing conservation strategies and fostering resilience amidst biodiversity and climate crises.

Integrated study on the natural variation in Arabidopsis thaliana responses to alkaline salinity

Maria José Almira-Casellas, Mercè Llugany Ollé, Charlotte Poschenrieder

Universitat Autònoma de Barcelona, Animal and Plant Ecology Department, Plant Physiology Unit. Mariajose.almira@uab.cat

More than 20 % of world's cultivated area is affected by alkaline salinity stress, but 98% of plants are glycophytes – unable to successfully grow under salinity. Here, the natural variation existing in the responses of of *Arabidopsis thaliana* to salinity on siliceous and calcareous soils was assessed. First, genomic divergence between early and late flowering individuals was addressed by a landscape genomics approach, which revealed evidence of different potential selective patterns within the collection. Moreover, candidates for enhanced tolerance to alkaline salinity, involved in the regulation of the plant K^+ status and the acidification of intracellular compartments, were identified. Next, transcriptomic analyses allowed for the description of the convergent and divergent response pathways between neutral and alkaline salinity. Finally, the genomic regions involved in alkaline salinity responses were assessed in a broader *Arabidopsis thaliana* natural diversity panel by means of Genome-Wide Association Studies (GWAS). Overall, the present study provided key targets for breeding in alkaline saline soils by means of integrating genomics, transcriptomics, physiological measurements, and association analyses.

Diving into fish pathology: the case of *Merluccius merluccius* from the Catalan coast (NW Mediterranean Sea)

Laura Muns-Pujadas, Maria Constenla, Sara Dallarés, Francesc Padrós

Departament de Biologia Animal, de Biologia Vegetal i d'Ecologia, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, 08193, Barcelona, Spain

Pathology and histopathology are diagnostic techniques to detect diseases, parasites and alterations that can occur in important commercial fish species such as *Merluccius merluccius*. A description of the alterations identified in juvenile specimens of *M. merluccius* from the Catalan coast is provided from 108 individuals collected in 2007 and 2019. Organs from the fixed fish were inspected macroscopically for alterations and parasites and processed by routine paraffin histology for histopathological assessment. No macroscopic alterations were found but several parasites were detected. The most common alterations were detected in gills (i.e. foci of inflammation and hyperplasia (67.7%), cysts of unknown aetiology (46.7%)). Coelozoic myxosporean parasites were detected within the renal tubules (63%). Alterations found in gills and internal organs were usually related to the presence of ecto and endoparasites. However, the intensity and extension of the lesions found were limited.

PÒSTERS

Plant growth improvement by microbial inoculation of *Sinapis alba* plants exposed to salinity

Ginevra Bellegrandi (1), Glòria Escolà (2), Silvia Busoms (2), Eliana Bianucci (2)

(1) Master's student in Terrestrial Ecology and Biodiversity Management, Bioscience Faculty, Universitat Autonoma de Barcelona

(2) Plant Physiology Laboratory, Bioscience Faculty, Universitat Autonoma de Barcelona

Salinity is a menace for agriculture, which causes significant yield losses worldwide. Plant microbiome interactions are essential to counteract abiotic stresses. Here, microbial inoculums were retrieved from the rhizosphere of a salt tolerant wild Brassicaceae. Five PGPB were selected to determine the effects of individual inoculation in *S. alba* plants under salt stress conditions. Plants were cultivated in a sterile sand semi-hydroponic system, inoculated with a 10^8 cfu/ml bacterial suspension after a week, and subjected to increasing salinity stress for 3 weeks. Our results corroborate that *S. alba* inoculated with any of the coastal bacteria were able to bear 150 mM NaCl, increasing plant growth compared to non-inoculated plants under the same conditions. Moreover, each strain modulated plant stress response in a specific way. More studies will be conducted to test the efficiency of microbial consortium to evaluate its impact in comparison with individual inoculation.

The study of microcracking pattern in fractured bones: Is this a proper method for distinguishing between blunt force trauma and gunshot trauma fractures?

Anna Casas (1), Ignasi Galtés (1, 2, 3), Núria Armentano (1,3,4), Xavier Jordana (1)

(1) Biological Anthropology Unit, Department of Animal Biology, Plant Biology and Ecology, Faculty of Biosciences, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, 08193 Barcelona, Catalonia, Spain

(2) Forensic Anthropology Unit, Catalonian Institute of Legal Medicine and Forensic Science (IMLCFC), Ciutat de la Justícia, Gran Via de les Corts Catalanes, 111 Edifci G, 08075 Sabadell, Barcelona, Spain

(3) Research Group of Biological Anthropology (GREAB), Biological Anthropology Unit, Department of Animal Biology, Plant Biology and Ecology, Faculty of Biosciences, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, 08193 Barcelona, Catalonia, Spain

(4) ANTROPOLEG.LAB, Rossend Arús, 46 baixos 1a 08014 Barcelona, Catalonia, Spain

Timing and determining the type of trauma that has caused a fracture is one of the most challenging but important tasks of a forensic anthropologist. Because of that, many studies have been done in this field, however, most of them are based on macroscopic methods. Although since the moment the histological study of the fractures was used as a complementary technique, in the last few years some research have proven that the histological study of the microcrack (MCK) pattern is a proper method to establish the differential diagnosis between peri and postmortem bone fractures and to determine the vitality of fresh bone fractures. Since now, all the investigations have been focused on timing but none on the type of trauma, so this study aims to determine if the MCK pattern differs in cases of gunshot trauma (GST) and blunt force trauma (BFT). To this purpose, we are histologically comparing the number, length, proportion, and structural distribution of MCK in long bones, ones with gunshot trauma from a common grave of the Spanish Civil War and others with blunt force trauma from autopsy cases. In summary, we expect to find a different MCK pattern in both types of traumas as the weapon, implied area, and the force and velocity of the shock are different, so the deformation of the bone may be different too. Our preliminary results show that the MCK pattern is different in the two types of injuries. We generally have observed that in GST the proportion of MCK is lower and they used to be longer, we find them in the interstitial area following the cement line. So, the study of MCK pattern probably can be used as a tool to distinguish between both types of trauma.

Small-scale variability of the small-spotted catshark *(Scyliorhinus canicula)* parasite community: a case study along the Catalan coast (NW Mediterranean)

Andrea Higueruelo, Maria Constenla, Anna Soler-Membrives, Sara Dallarés

Departament de Biologia Animal, Biologia Vegetal i Ecologia (BABVE), Universitat Autònoma de Barcelona (UAB)

The small-spotted catshark *(Scyliorhinus canicula)* is a bottom-dwelling elasmobranch with an Atlantic and Mediterranean distribution that represents the most discarded catch in terms of biomass in the Catalan coast. Parasite assemblages are an important tool for host stock discrimination and provide information on trophic interactions and host biology and ecology. The present work aims to characterize the parasite community of *S. canicula* in relation to condition indices and local variability in the NW Mediterranean Sea.

The parasite community of *S. canicula* was characterized by low richness and diversity in all areas. A total of 12 parasite taxa were found of which five were considered common. All sharks were infected by at least one parasite and showed a total mean abundance of 55.2 parasites/shark. Multivariate analyses revealed significant differences among localities for the composition and structure of parasite communities. Bray-Curtis similarity index ranged between 41% and 77% among zones and between 69% and 81% within zones, with the most contributing parasites being the nematode *Proleptus obtusus* and the cestode *Grillotia adenoplusia*. No significant correlations were found between sharks' condition indices and parasitological descriptors, except for total abundance in Ebro Delta, which was correlated with total length ($p < 0.005$, $r_p=0.63$).

Lessons learned from commercially important fish and crustaceans: what do THEY eat and what do WE eat?

E. Carreras-Colom, O. Rodríguez-Romeu, L. Muns-Pujadas, **A. Higueruelo**, S. Dallarés, M. Constenla, F. Padrós, M. Carrassón, A. Soler-Membrives

Departament de Biologia Animal, Biologia Vegetal i Ecologia (BABVE), Universitat Autònoma de Barcelona (UAB)

The increasing presence of marine debris in the sea poses a threat to their inhabitants. Many studies have described the ingestion of macro- and microlitter in a variety of organisms, from small planktonic species to big mammals and including commercial species as well. As a result, public opinion has built up, tagging seafood as a significant route of exposure to plastics for humans.

The goal of the multidisciplinary research project PLASMAR was to evaluate the levels of anthropogenic items (AIs, including plastics and cellulosic fibres) in key species of the NW Mediterranean Sea. Moreover, the presence and characteristics of AIs in their surrounding environment (water and sediment) and the potential relationship between the abundance, shape, size and composition of ingested debris and the species' habitat and feeding behaviour was studied.

AIs were observed in all species with varied values of prevalence and abundance, and different characteristics. Cellulosic fibres were the most predominant items found in fish and synthetic fibres in crustaceans. Feeding behaviour and the morphology of the digestive system may play a key role in species showing the highest levels of AIs ingestion (crustaceans and catsharks).

Regarding human health, keeping in mind the amounts of AIs found (mostly <3 per individual) and the fact that digestive tracts (and so AIs) of fish and partially of crustaceans are not consumed, it should be stressed out how eating marine organisms might not be a significant route of exposure to AIs.

Microdistribució a la línia neonatal de dents decídues a partir de SXRF

Ani Martirosyan (1), Judit Molera (2), Assumpció Malgosa (1), Xavier Jordana (1)

(1) Unitat d'Antropolgoia Biológica, BABVE Department, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, Barcelona, Spain

(2) MECAMAT, Universitat de Vic, Universitat Central de Catalunya, Campus Torre dels Frares, Vic, Espanya

La identificació d'un naixement viu i un naixement mort és un desafiament important a l'antropologia física i la bioarqueologia. L'estudi de la línia neonatal (LNN) es considerat el mètode més òptim per distingir entre ells, ja que és una línia pronunciada de l'esmalt que es forma a les dents durant la mineralització a l'úter i es deu als canvis fisiològics que es produeixen al moment del naixement.

Tot i això, la detecció de la LNN en dents decídues pot ser difícil a causa de la presència de múltiples línies d'estrès. Amb l'objectiu d'identificar la LNN en aquestes mostres que no es pot detectar de manera fiable per microscòpia òptica, hem utilitzat la tècnica analítica no destructiva de SXRF per estudiar la microdistribució dels Zn i Ca.

Els resultats han demostrat una clara demarcació entre l'esmalt i la dentina a totes les mostres analitzades. A més, a la LNN s'ha pogut observar una menor concentració de Ca i major de Zn i Cu.

El nostre estudi demostra la utilitat de la tècnica SXRF per identificar la LNN en dents decídues tenint sempre en compte la posició en què es fa l'anàlisi de la microdistribució.

Lessons learned from a multidisciplinary project (PLASMAR): quantification of micro-litter in marine organisms and impact on their health status

Ester Carreras-Colom, Oriol Rodríguez-Romeu, **Laura Muns-Pujadas**, Andrea Higueruelo, Sara Dallarés, Maria Constenla, Francesc Padrós, Maite Carrassón, Anna Soler-Membrives

Departament de Biologia Animal, de Biologia Vegetal i d'Ecologia, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, 08193, Barcelona, Spain

Marine litter, including plastics, has been pointed out as one of the greatest threats for the environment. The PLASMAR project aimed to study the impact of micro-litter ingestion on marine organisms in the NW Mediterranean Sea, considered one of the most polluted areas. To this end, a multidisciplinary approach was used, combining different endpoints (i.e. histopathology, study of parasite load and communities, condition indices and enzymatic biomarkers), to assess the health status of key commercial fish and crustacean species from different environments. Overall, and despite the relevant concentrations of synthetic fibres found in some crustacean species, as well as generalised spatial trends in the levels of microlitter ingestion among locations, no significant health impact related to microlitter ingestion could be identified. However, caution should be kept in extrapolating these results to different sized organisms as AIs may affect them differently.

Evaluación de la metodología msGBS en la identificación y cuantificación de diatomeas

Daniel Munzón (1), Miquel Àngel Senar (1), Josep Piñol (2, 3)

(1) Departament d'Arquitectura d'Ordinadors i Sistemes Operatius (CAOS), Universitat Autònoma de Barcelona (UAB)

(2) Departament de Biologia Animal, Biologia Vegetal i Ecologia (BABVE), Universitat Autònoma de Barcelona (UAB)

(3) Centre de Recerca Ecològica i Aplicacions Forestals (CREAF)

¿Cómo se puede identificar y cuantificar la biodiversidad en una mezcla natural de ADN de distintas especies? El método más común actualmente, el metabarcoding, es capaz de identificar las especies, pero no proporciona su abundancia relativa. Por este motivo, existe una necesidad de crear nuevas metodologías para conseguir este objetivo. Una posible alternativa es multispecies genotyping by sequencing o msGBS (Wagemaker et al., 2020). Aquí tratamos de comprobar la efectividad del msGBS para identificar y cuantificar especies de diatomeas en mezclas artificiales in silico. Para crear las referencias, se utilizan genomas enteros y se cortan utilizando distintas enzimas de restricción tomadas individualmente y por parejas. Las mezclas se generan tomando muestras aleatorias de los distintos genomas y mezclándolas; durante el proceso, se introducen pequeñas variaciones en las secuencias para simular posibles errores de secuenciación reales.

Effect of a computed tomography radiation dose in cells with diferent radiosensitivity

Palma-Rojo, Elia (1,2), González, Juan Ramón (2,3), Barquinero, Joan-Francesc (1), Armengol, Gemma (1)

(1) Unitat d'Antropologia Biològica, Departament de Biologia Animal, Biologia Vegetal i Ecologia, Universitat Autònoma de Barcelona, E-08193, Bellaterra, Catalonia, Spain.

(2) Barcelona Institut for Global Health, ISGlobal, Dr Aiguader 88, 08003 Barcelona, Spain

(3) CIBER Epidemiología y Salud Pública (CIBERESP), Barcelona, Spain

The use of computed tomography (CT-scan) has increased drastically in recent years. Despite its value as a diagnostic tool, concerns have been raised given the relatively high doses of ionizing radiation employed in such technique in comparison to other diagnostic procedures. In fact, an association between the CT-scan radiation dose and the risk of leukaemia or brain tumors in children has been already observed.

It is known that there are interindividual differences in the response to high or medium radiation doses. To predict the differences, several biomarkers have been evaluated at medium or high doses, but there is a lack of studies performed at low doses such as the ones administrated in a CT-scan. To study the differences at such low doses, two cell lines with different radiosensitivity (one radiosensitive and one radioresistant) were irradiated at 20 mGy (approximately the dose of a CT-scan) and 500 mGy. Differences between cell lines were observed in gene expression, DNA damage induction and repair, proliferation, and cell mortality. The radiosensitive cell line presented higher DNA damage and worst DNA-repair capacity, more proliferative cells, and higher mortality, whereas the radioresistant presented a downregulation of genes involved in the innate immune response.

Causes of death in Cal Pa i Figues XIV century necropolis: a paleogenomic approach

Silvia Quintana-Sanchez, Cristina Amor-Jimenez, Daniel R. Cuesta-Aguirre, Núria Armentano, Assumpció Malgosa, Cristina Santos

Unitat d'Antropologia Biologica, Departament de Biologia Animal, Biologia Vegetal i Ecologia (BABVE), Universitat Autònoma de Barcelona (UAB)

Collective burial, with evidence of burials in a short period of time, as observed in the multiple grave (UF54) of the 14th century necropolis of Cal Pa i Figues (Vilafranca del Penedès, Alt Penedès), led us to hypothesise if the burials represent individuals that died caused by an epidemic event. The chronology of the Cal Pa i Figues necropolis coincides with the period of the great epidemic caused by the black plague, produced by the bacterium *Yersinia pestis*, which spread across the European continent between 1347 and 1351.

Yersinia pestis, the etiological agent of the infamous bubonic plague, has left an indelible mark on human history. In recent years, the emerging field of paleogenomics has provided invaluable insights into the genomic characteristics of this ancient pathogen. The application of paleogenomics to Yersinia pestis has revolutionized our understanding of the plague's history. By extracting and sequencing ancient DNA from skeletal remains and teeth of plague victims, researchers have been able to reconstruct the genome of ancient *Yersinia pestis* strains. These genomic analyses have shed light on the origins, genetic diversity, and adaptive changes of the pathogen over time. The aim of this project is to search for genetic evidence of viruses or bacteria that provide information on the cause of death of the individuals buried in the 14th century necropolis of Cal Pa i Figues (Vilafranca del Penedès, Alt Penedès), specifically in the UF54.

Deeping on the reproductive strategy of the small-spotted catshark (Scyliorhinus canicula) in the Catalan coast

Pau Robles, Sara Dallarés, Andrea Higueruelo, Anna Soler-Membrives

Departament de Biologia Animal, Biologia Vegetal i Ecologia (BABVE), Universitat Autònoma de Barcelona (UAB).

Reproductive features and population trends are key aspects to assess population dynamics and develop management programs. For this study, 1795 individuals of *Scyliorhinus canicula* were obtained throughout a year in the Catalan coast, sampling twice a month. During the dissection procedure, biometric data was recorded, and reproductive tissues were processed for histological studies. Three and four reproductive stages for males and females, respectively, were described macroscopically and microscopically. The presence of mature-laying females and mature males throughout the year support a prolonged reproductive period. Variation of gonadosomatic (GSI) and hepatosomatic (HSI) indices in relation to maturity stages was observed. In females, the decrease of HSI when maturity is reached could be explained by the mobilization of vitellogenesis precursors from the liver.

Analysis of radiation induced γ-H2AX and apoptosis in peripheral blood lymphocytes from breast cancer patients

Ángela Solana (1), Juan S. López (1), Mònica Pujol-Canadell (1,3), Miquel Macià (2,3), Evelyn Martínez (2,3), Isabel Linares (2,3), Ferran Guedea (2,3), Gemma Armengol (1), Joan F. Barquinero (1).

(1) Unit of Biological Anthropology, Department of Animal Biology, Plant Biology and Ecology, Universitat Autònoma de Barcelona, Bellaterra, Spain

(2) Department of Radiobiology and Cancer, ONCOBELL – IDIBELL, Barcelona, Spain

(3) Radiation Oncology Department. Institut Català d'Oncologia, L'Hospitalet de Llobregat, Barcelona, Spain

Radiotherapy (RT) is a relevant part of the treatment to fight breast cancer. According to the data obtained to date between 5-10% of treated patients suffer radiation-associated toxicity in normal tissue, such as breast fibrosis. So far, some biomarkers have been described that could predict adverse reactions after RT, being cellular and genetic biomarker assays the most outstanding. Indeed, recent studies have independently identified as potential predictors of the late onset of fibrosis the kinetics of disappearance of phosphorylated histone H2AX (γ-H2AX), and the degree of apoptosis in CD8 lymphocytes. The aim of the present study is to find if there is any correlation between these two biomarkers.

Peripheral blood samples from breast – cancer patients in remission were recruited. After mononucleated cells isolation, samples were irradiated at 2 Gy to analyze the kinetics of disappearance of γ-H2AX foci, which was assessed by flow cytometry. Foci were evaluated at 1, 2, 4, and 24 h post-irradiation. Radioinduced apoptosis was evaluated by flow cytometry in CD8 lymphocytes irradiated at 8 Gy and maintained at 37°C during 24 and 48 h.

In conclusion changes in γ-H2AX fluorescence intensity have been observed between non-irradiated cells and irradiated cells as well as significant differences in the percentage of lat-apoptotic vells between 24 and 48 h after irradiation. After the analysis a negative correlation was observed only with non-irradiated and 24 h post -irradiation cells and late-apoptotic cells 48 h post-irradiation.