Clase

Ecología de peces

Nicolas Vidal

TopZvert 2022

Contenido de la presentación:

Patrones globales de diversidad

Diversidad de grupos tróficos en peces

Conceptos clave: tramas, cadenas y cascadas tróficas

Cambio global (clima)

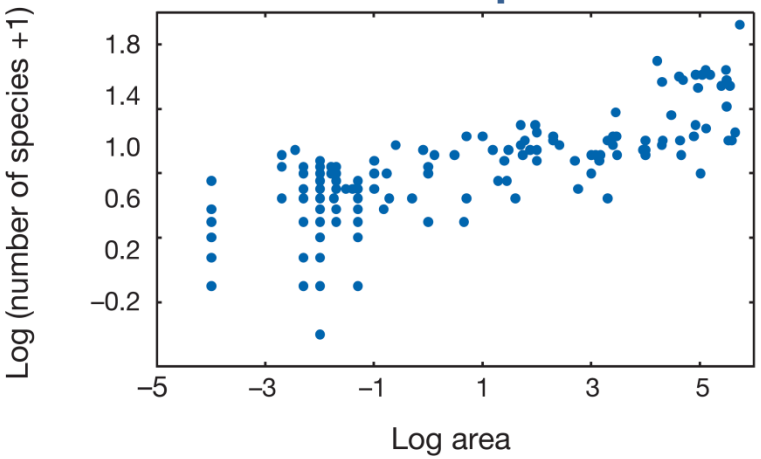
Efecto sobre las comunidades de peces y las tramas tróficas

Plasticidad fenotípica (digestivo)

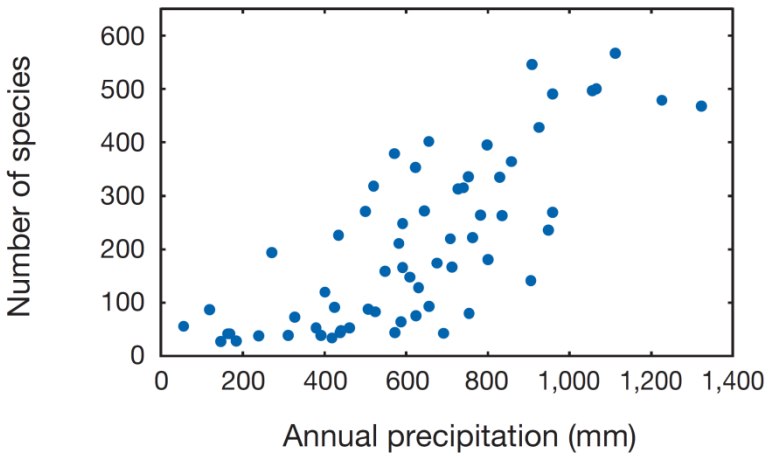
Global patterns in biodiversity

Kevin J. Gaston

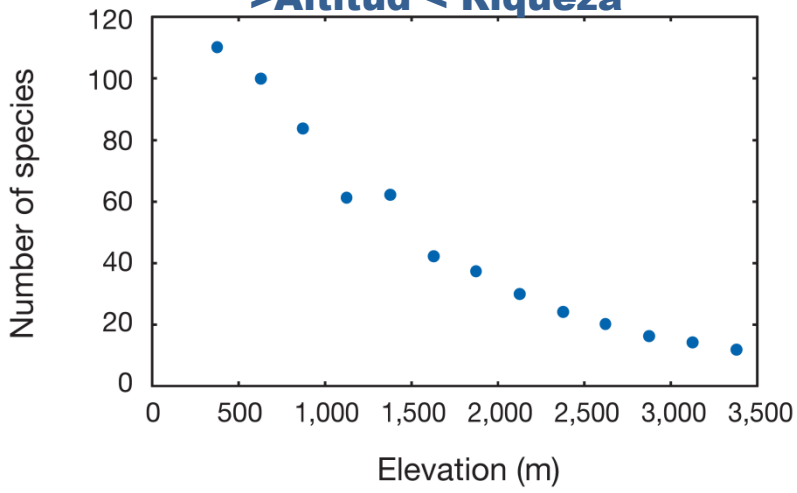
> Área > Riqueza



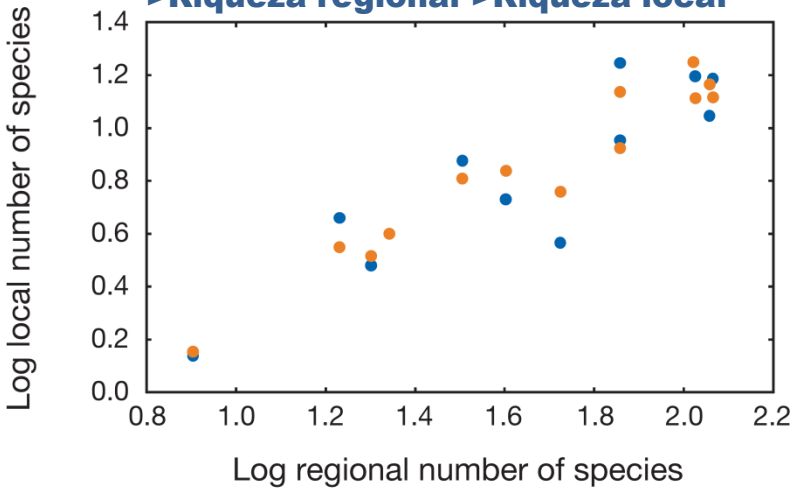
> Precipitación > Riqueza



>Altitud < Riqueza

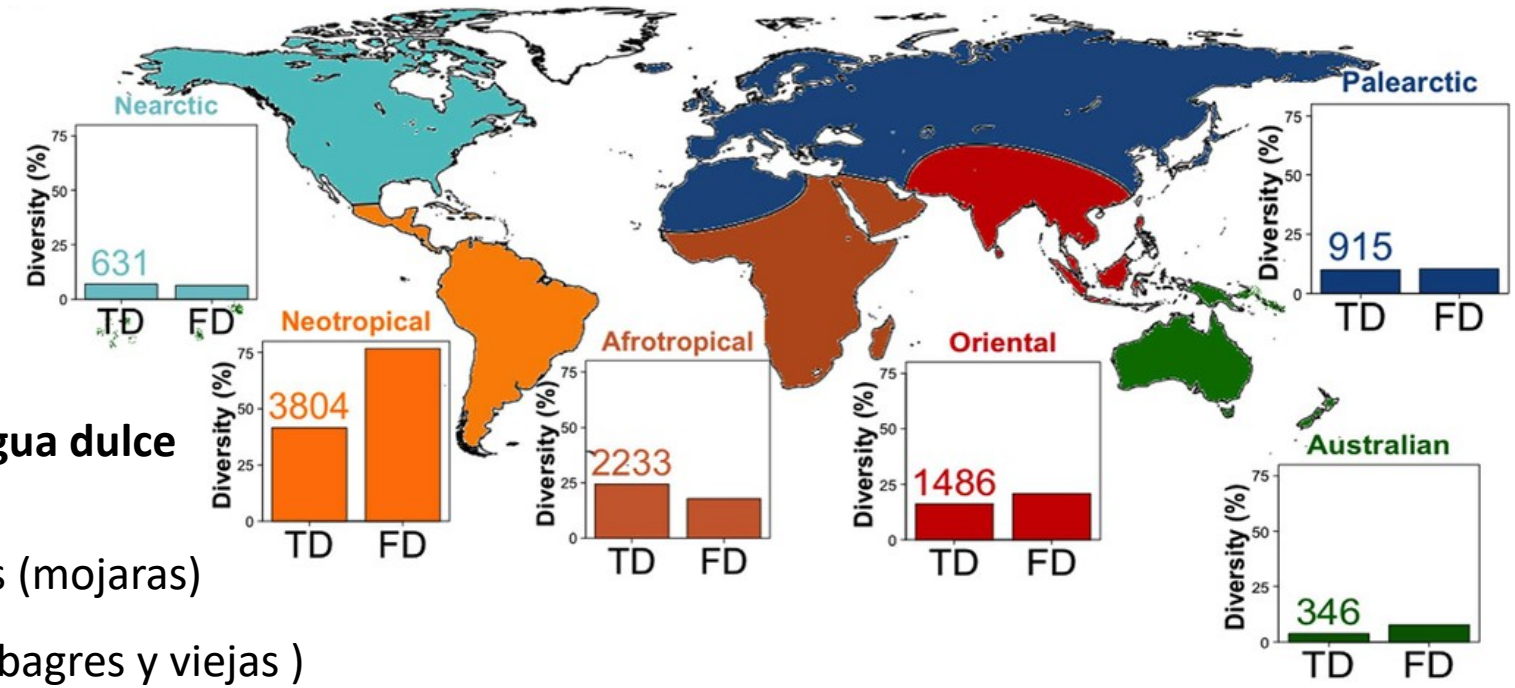


>Riqueza regional >Riqueza local



Gaston 2000- Nature

Introducción:Peces de agua dulce



Uruguay
220-250 sp. de agua dulce

Characiformes (mojaras)

Siluriformes (bagres y viejas)

Gymnotiformes (peces eléctricos)

Perciformes (Cíclidos y scianidae)

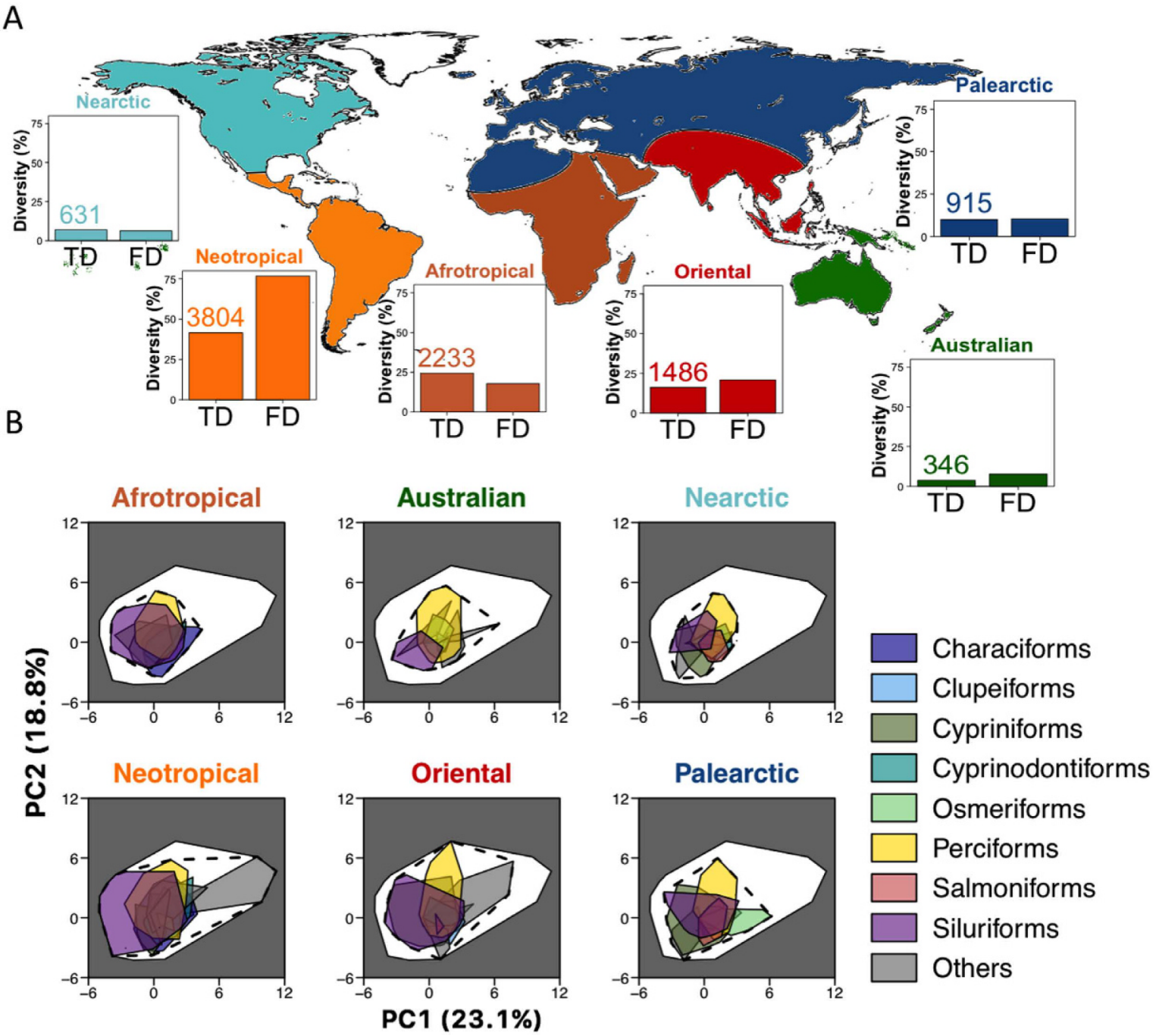
Cyprinodontiformes (madrecitas y peces anuales)

Clupeiformes (lachas y sardinas)

Atheriniformes (pejerreyes)

Potamotrigonidae (rayas de río)

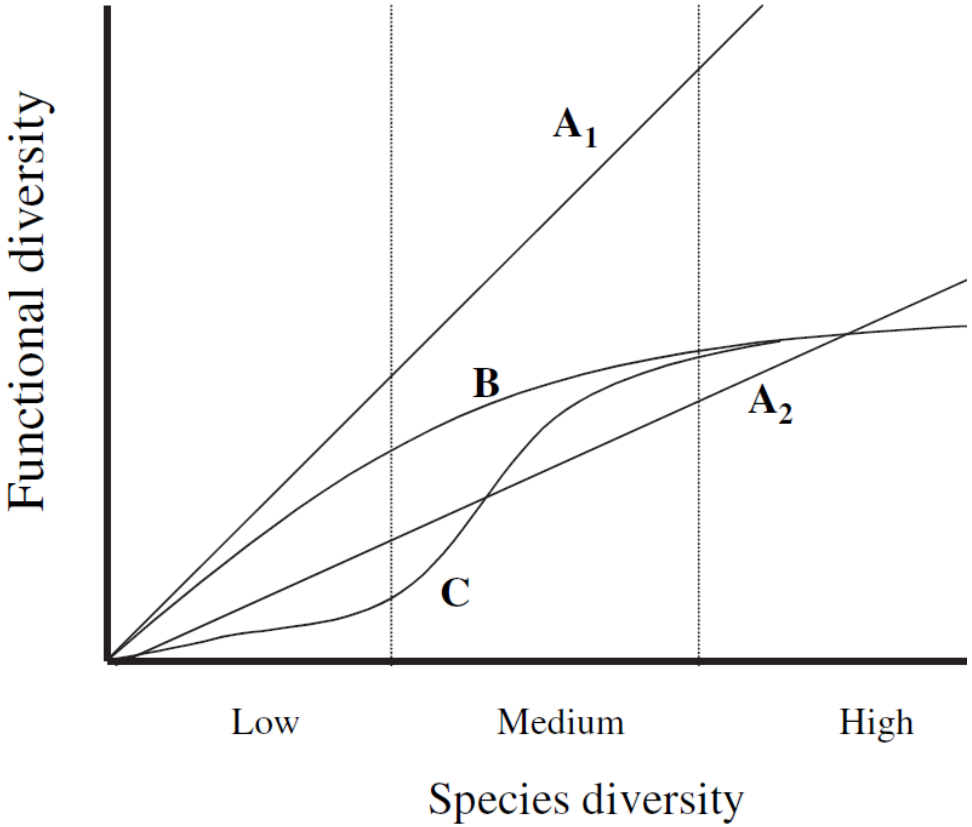
(Toussaint 2016).


A
Nearctic
Diversity (%)
631
TD
FD
Palearctic
915
Neotropical
3804
Afrotropical
2233
Oriental
1486
Australian
346
B
Afrotropical
Australian
Nearctic
Neotropical
Oriental
Palearctic
PC2 (18.8%)
PC1 (23.1%)
Characiforms
Clupeiforms
Cypriniforms
Cyprinodontiforms
Osmeriforms
Perciforms
Salmoniforms
Siluriforms
Others

Ecology Letters, (2005) **8**: 391–400 doi: 10.1111/j.1461-0248.2005.00731.x

LETTER

Low functional redundancy in coastal marine assemblages



A1) ≥1 cada sp. función única

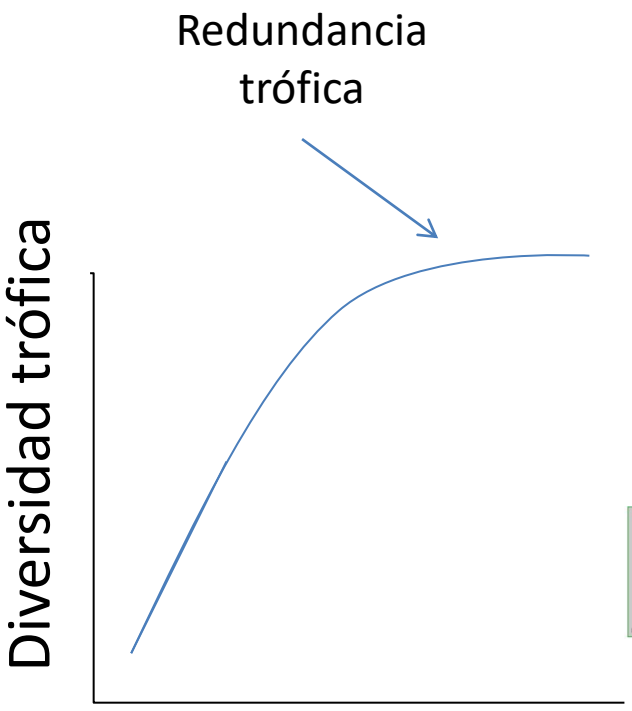
A2) <1 muchas sp. similar función

B) DF aumenta hasta la asíntota

C) DF aumenta solo a S intermedias

Micheli et al., 2005 Guillemot et al., 2011

Diversidad taxonómica vs diversidad trófica

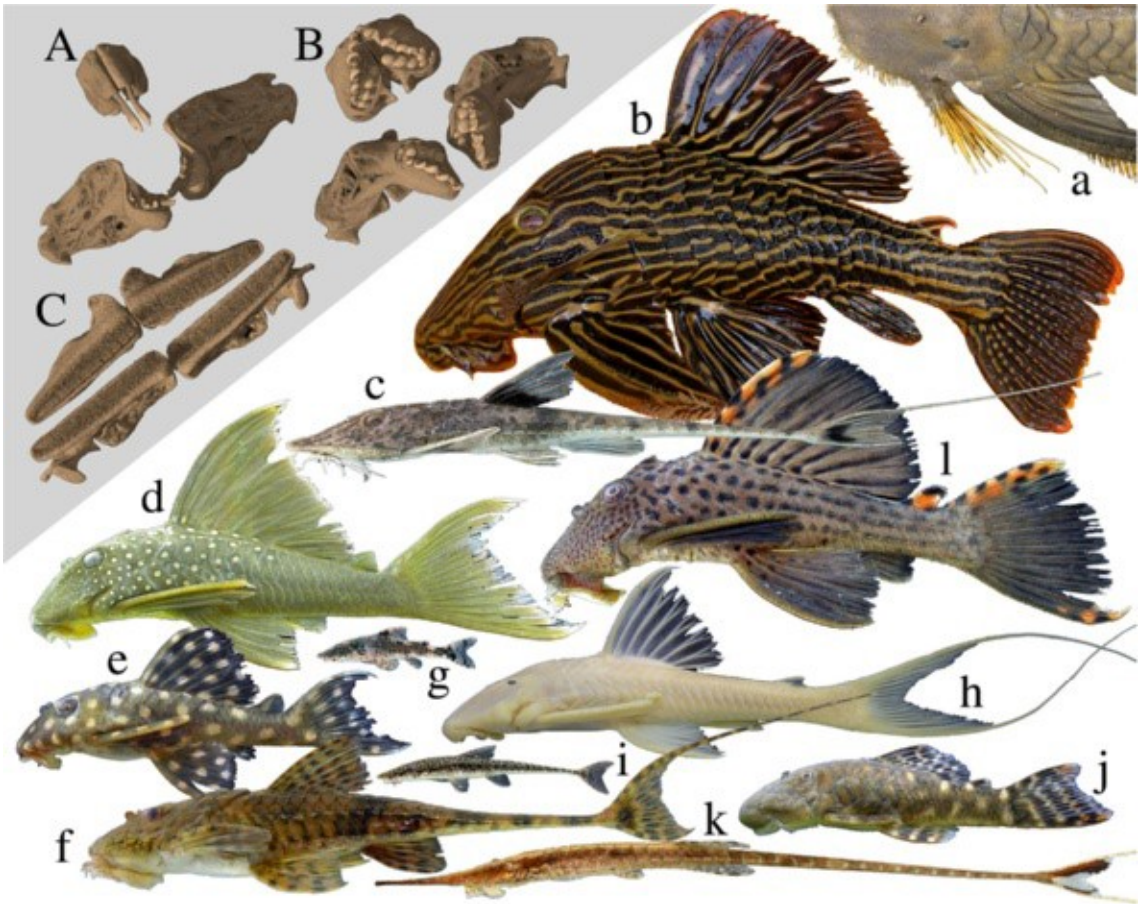


Diversidad trófica: Rol de los peces en las tramas tróficas

RESEARCH ARTICLE Open Access

Trophic diversity in the evolution and community assembly of loricariid catfishes

Nathan K Lujan[1,2,3*], Kirk O Winemiller[1] and Jonathan W Armbruster[2]



Partición de nicho

Insectivoros

Comedores de madera

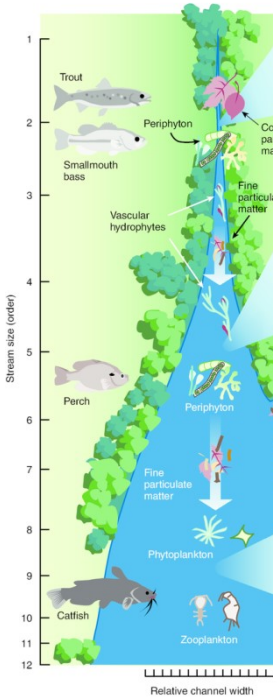
Alguivoros

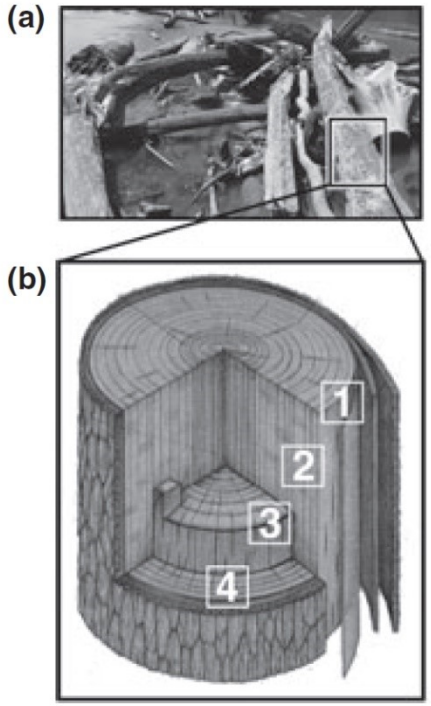
Functional Ecology

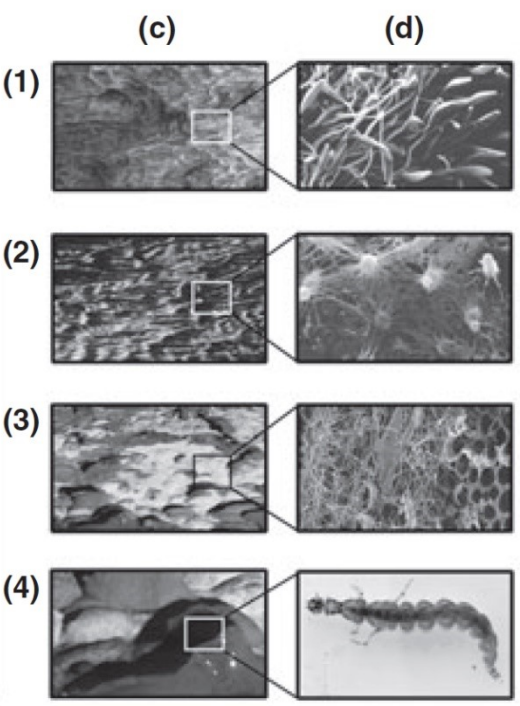
British Ecological Society

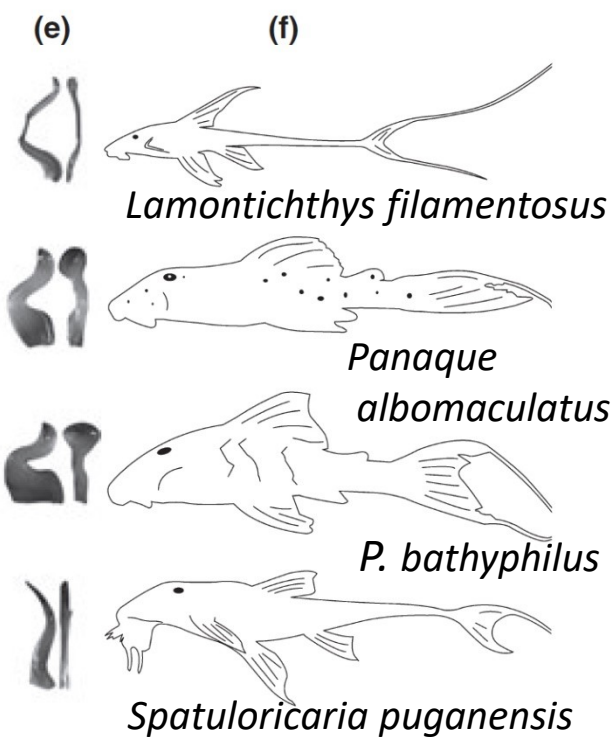
Do wood-grazing fishes partition their niche?: morphological and isotopic evidence for trophic segregation in Neotropical Loricariidae

Nathan K. Lujan*[1,2], Donovan P. German[3] and Kirk O. Winemiller[2]

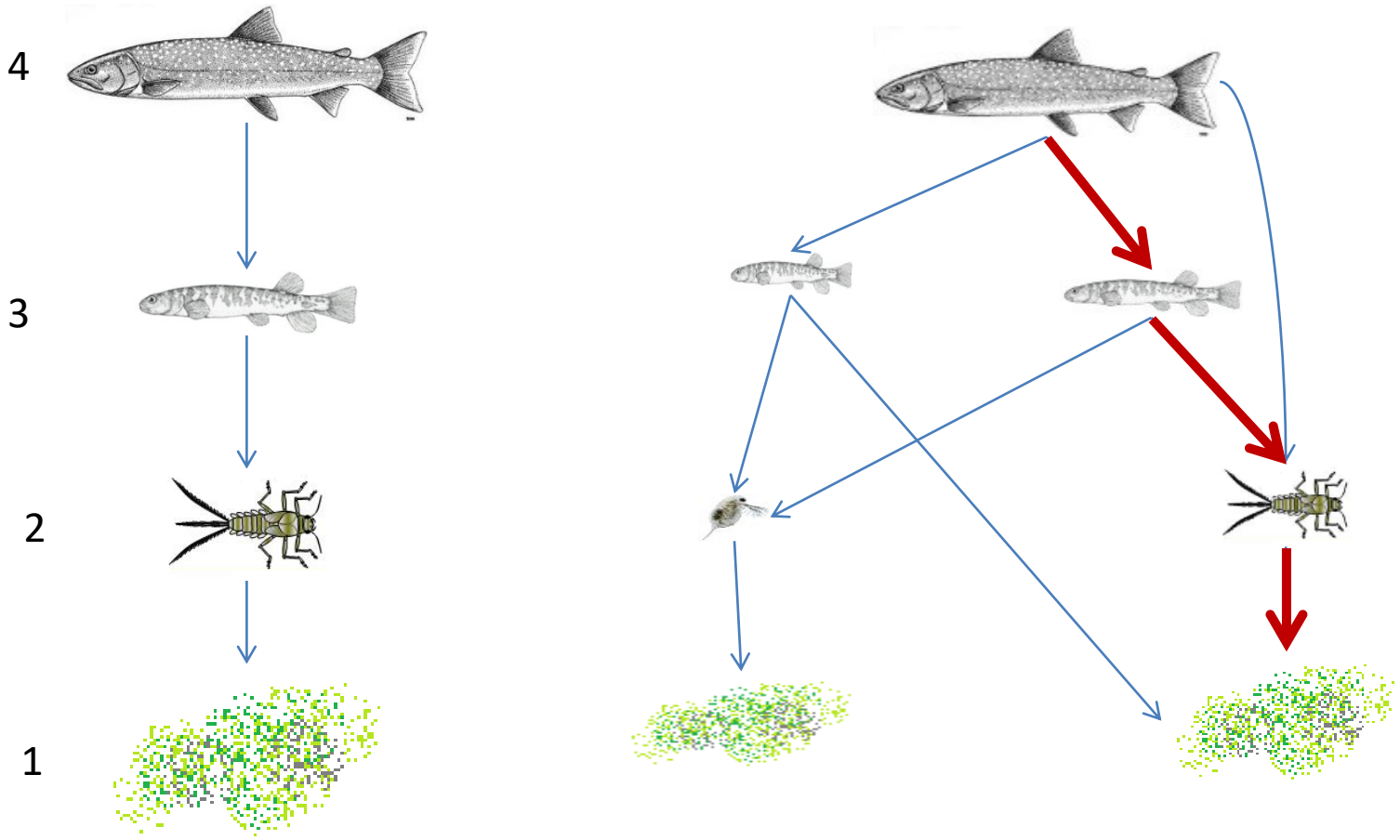






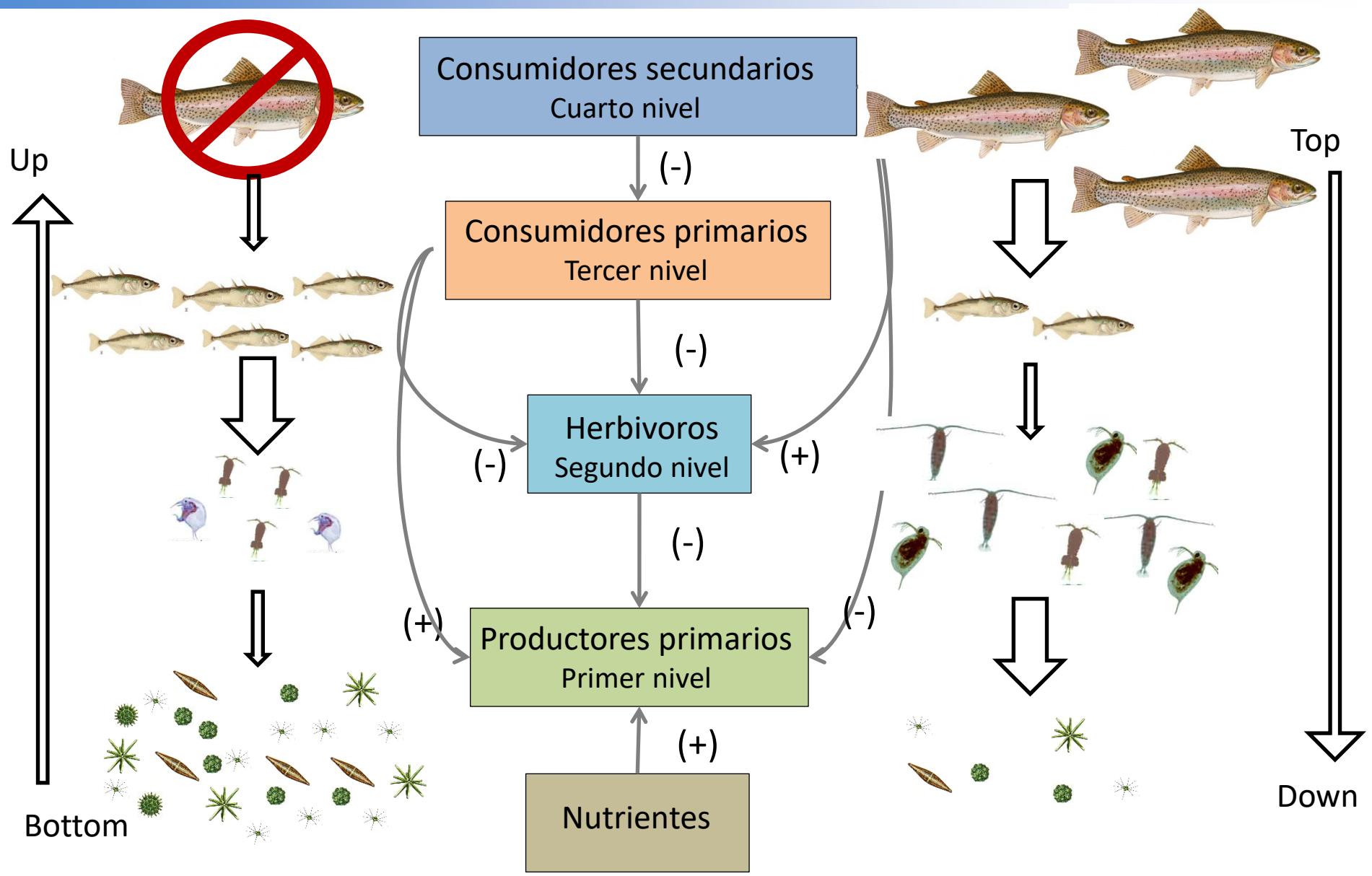


Tramas tróficas vs cadena trófica



Minagawa and Wada 1984; Post 2002

Concepto de cascada trófica: bottom up y top down



Carpenter et al., 1985, Carpenter and Kitchell, 1993

*“**Cambio global** se refiere al conjunto de cambios ambientales que se derivan de las actividades humanas sobre el planeta, particularmente a cambios en los procesos que determinan el funcionamiento del sistema tierra”.*

(Poff et al. 2002; Parmesan 2006; Rahel 2007)

Antecedentes

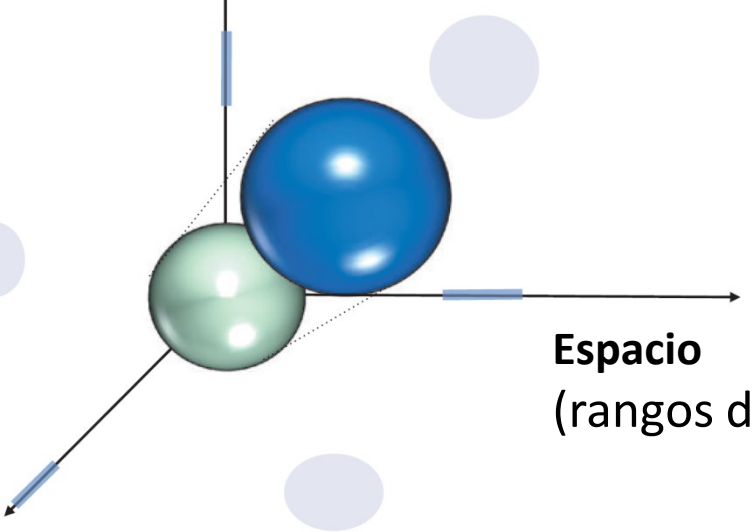
ECOLOGY LETTERS

Ecology Letters, (2012) **15**: 365–377 doi: 10.1111/j.1461-0248.2011.01736.x

REVIEW AND SYNTHESES

Impacts of climate change on the future of biodiversity

Tiempo
(fenológicos, ciclos de vida)

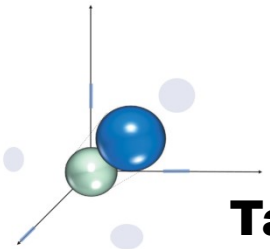


Espacio
(rangos de distribución, uso del espacio)

Organismos
(fisiológicos y comportamentales)

(Bellard et al., 2012)

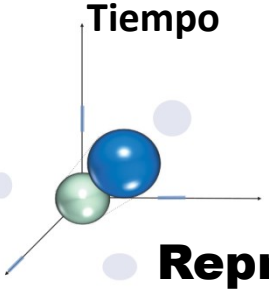
Efectos del Incremento de la temperatura sobre los peces



Organismos

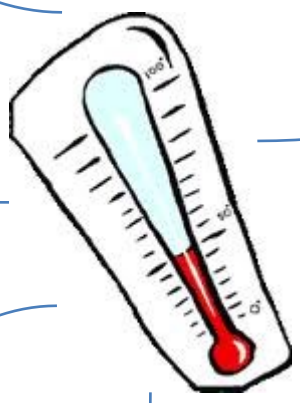
Tamaño corporal

Tiempo



Reproducción

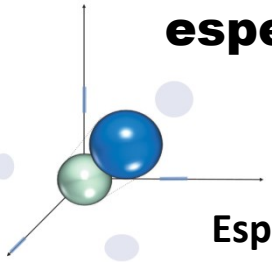
Alimentación



Distribución de las especies

Tramas tróficas

Oxígeno

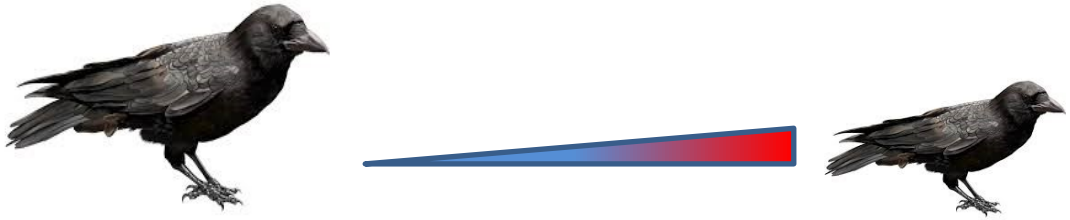


Espacio

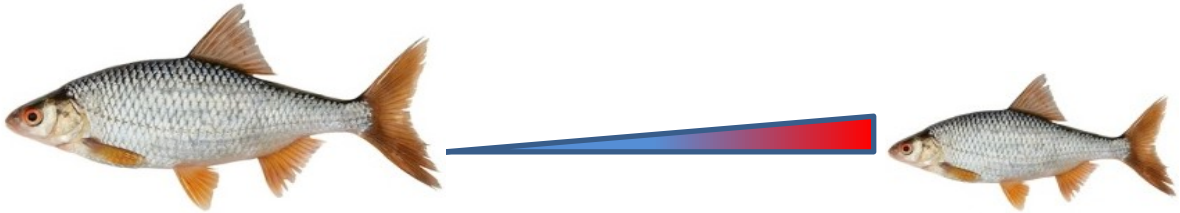
Historicamente el estudio del efecto del clima -> tamaño corporal

Bergmann's rule (Bergmann C, 1847)

James' rule (James F, 1970)



Temperature–size rule (TSR) (Atkinson D, 1994)



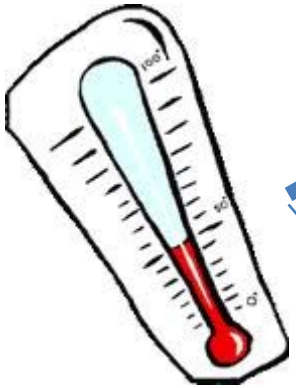
Efecto del calentamiento: tamaño corporal

Global warming benefits the small in aquatic ecosystems

Martin Daufresne[a,b,1], Kathrin Lengfellner[a], and Ulrich Sommer[a]

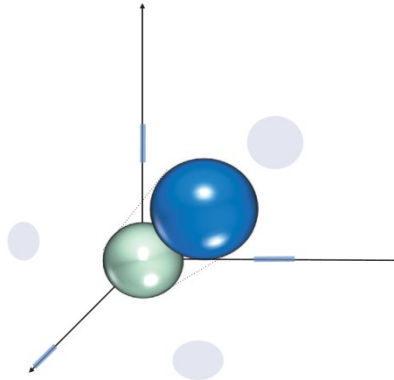
[a]FB3–Marine Ökologie, Leibniz-Institut für Meereswissenschaften (IFM-GEOMAR), 24105 Kiel, Germany; and [b]HYAX–Lake Ecosystems Laboratory, Cemagref, 13182 Aix-en-Provence, France

Edited by Stephen R. Carpenter, University of Wisconsin, Madison, WI, and approved June 3, 2009 (received for review February 25, 2009)



Procesos metabólicos

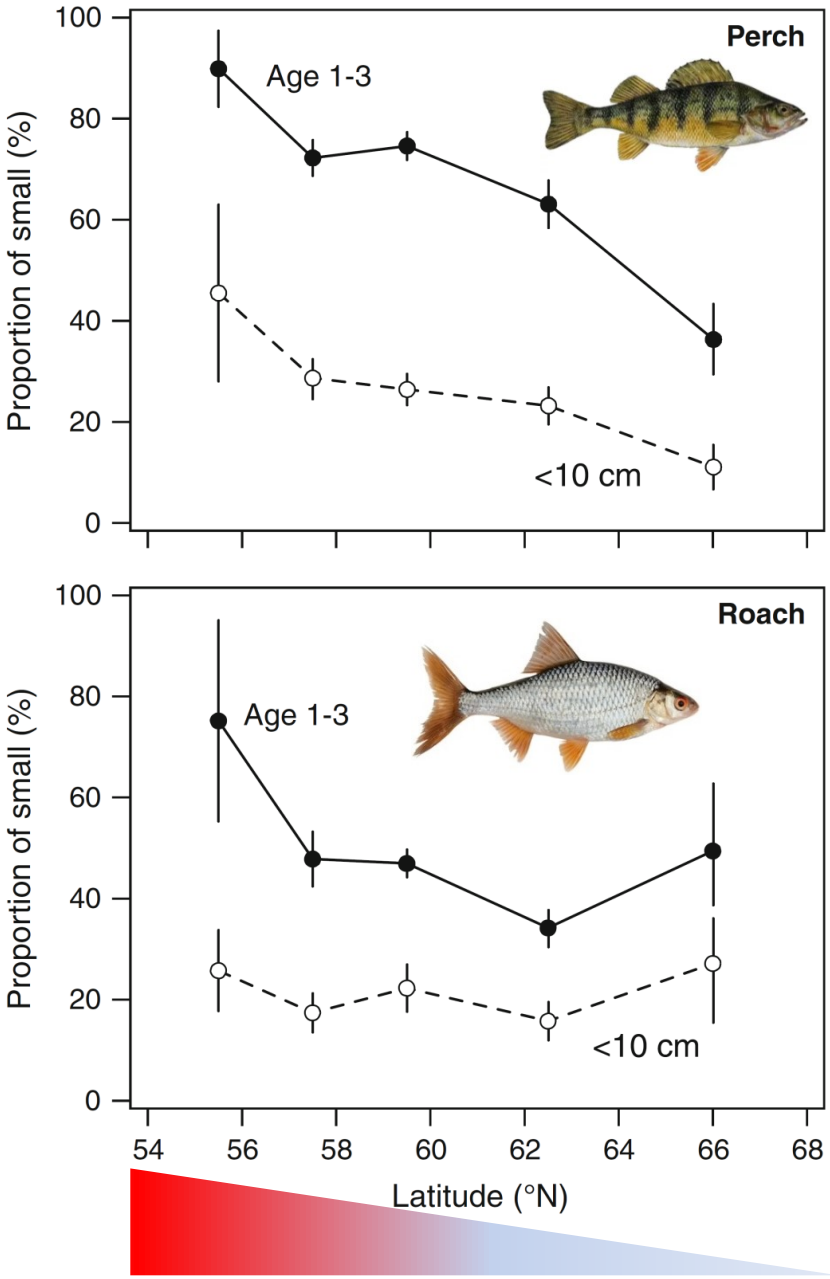
Disponibilidad de alimento

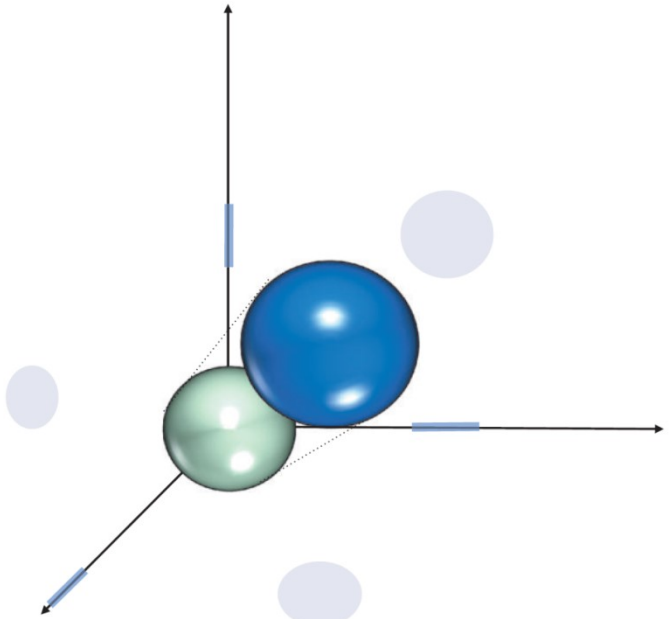


Organismos

(Brett, 1979; Elliott, 1994)

Tamaño corporal: Ejemplos de efectos de la teperatura





Organismos
(fisiológicos y comportamentales)

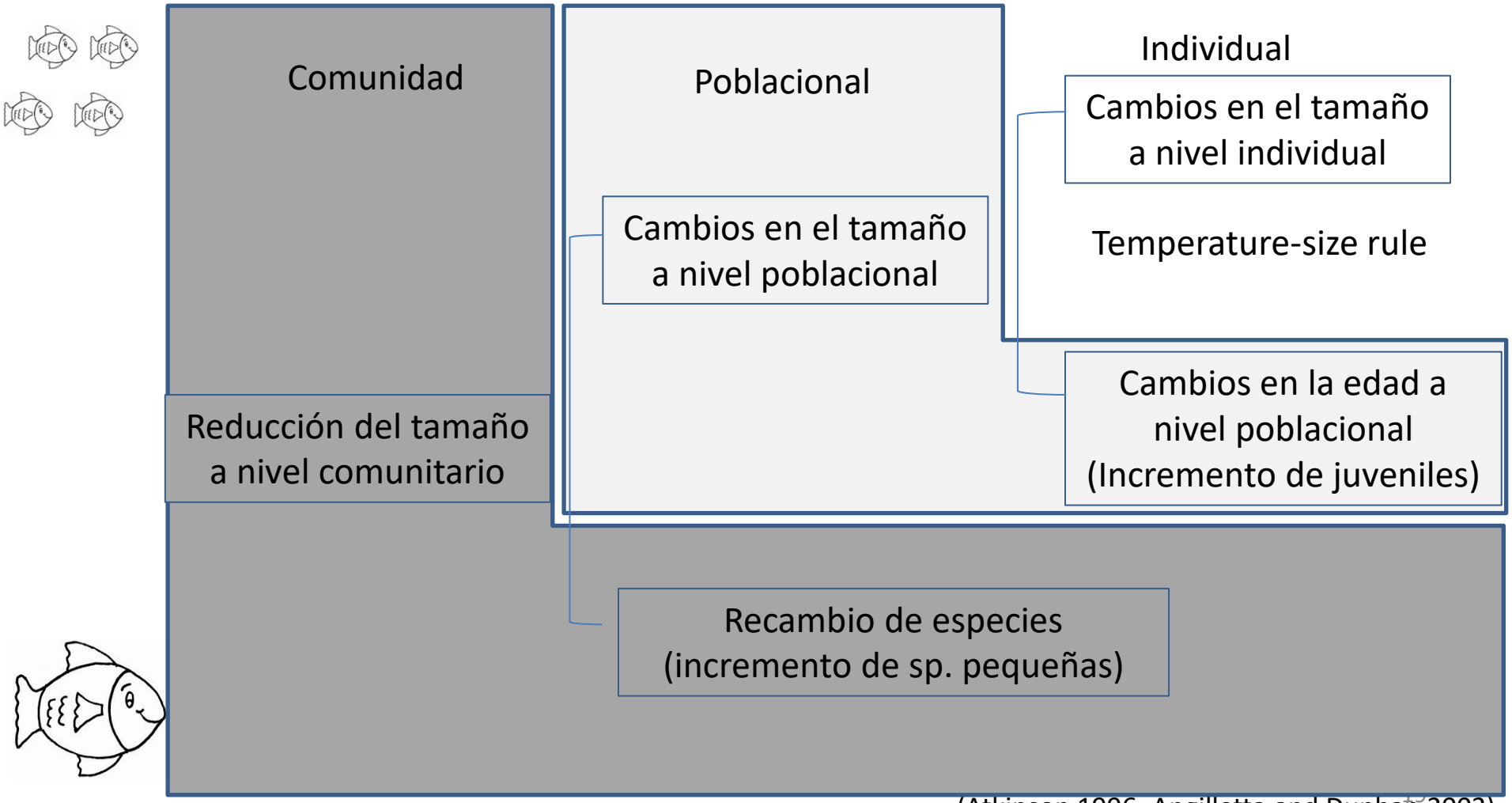
(Jeppesen et al., 2010).

Global warming benefits the small in aquatic ecosystems

Martin Daufresne[a,b,1], Kathrin Lengfellner[a], and Ulrich Sommer[a]

[a]FB3–Marine Ökologie, Leibniz-Institut für Meereswissenschaften (IFM-GEOMAR), 24105 Kiel, Germany; and [b]HYAX–Lake Ecosystems Laboratory, Cemagref, 13182 Aix-en-Provence, France

Edited by Stephen R. Carpenter, University of Wisconsin, Madison, WI, and approved June 3, 2009 (received for review February 25, 2009)



Daufresne et al 2009

(Atkinson 1996; Angilletta and Dunhan 2003)

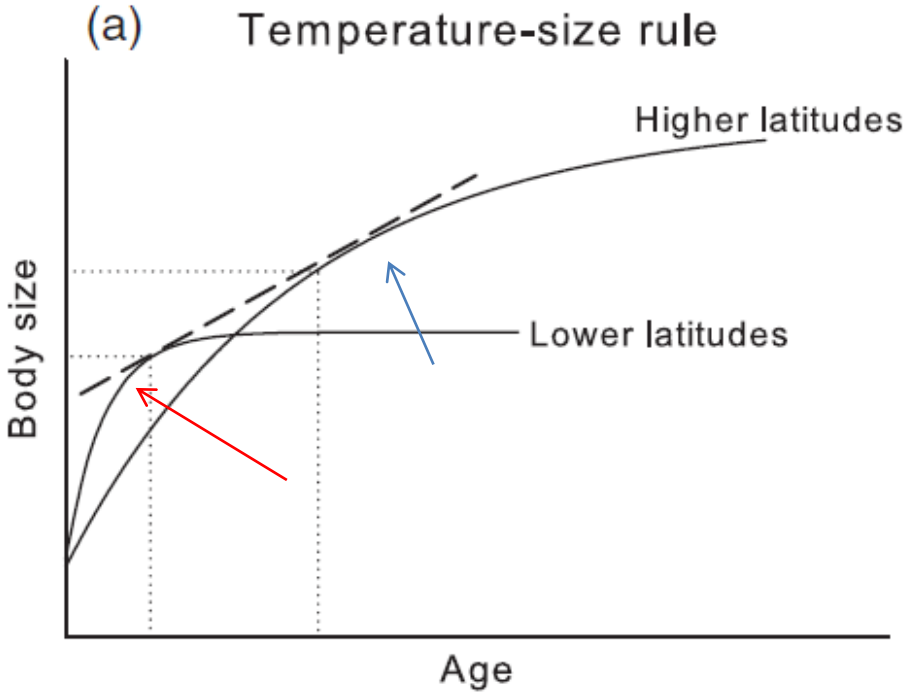
Journal of Animal Ecology

British Ecological Society

Journal of Animal Ecology 2014, **83,** 866–875 doi: 10.1111/1365-2656.12183

Temperature-related variation in growth rate, size, maturation and life span in a marine herbivorous fish over a latitudinal gradient

Elizabeth D. L. Trip[1]*†, Kendall D. Clements[1], David Raubenheimer[2] and J. Howard Choat[3]



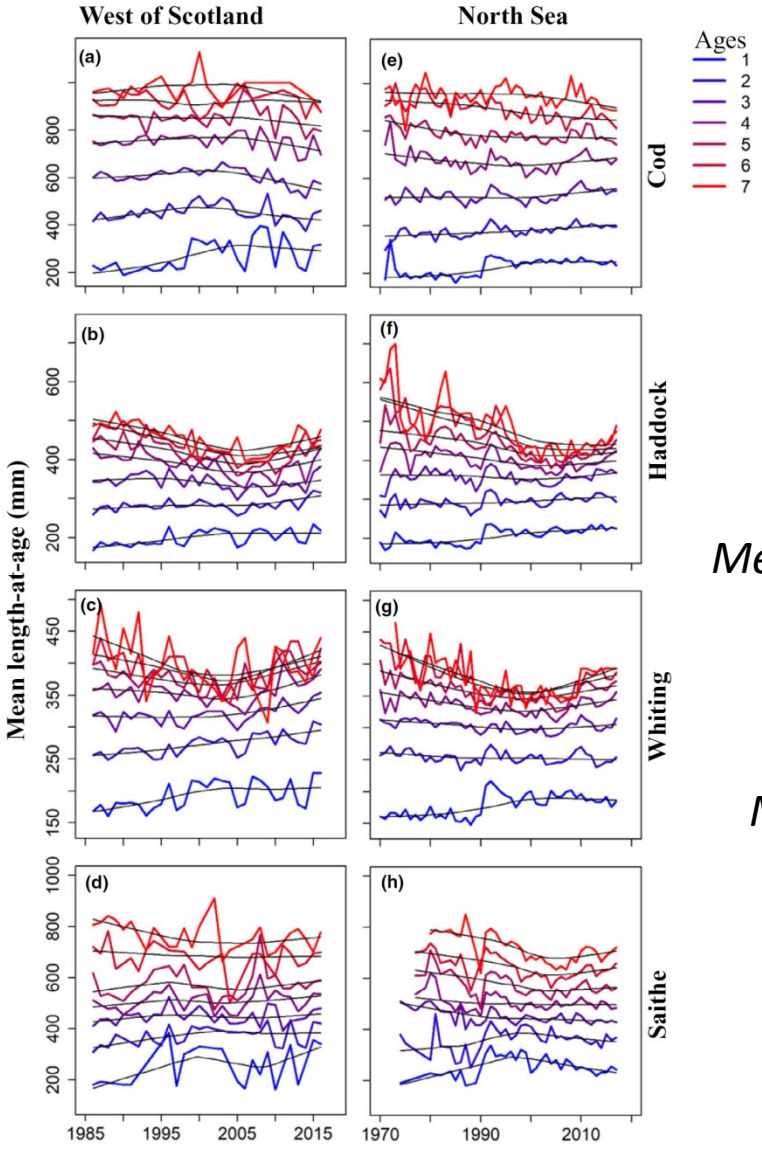
RESEARCH ARTICLE

Journal of Applied Ecology | BRITISH ECOLOGICAL SOCIETY

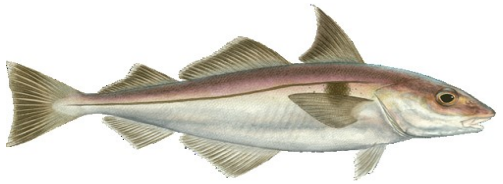
Evidencia a favor de la TSR

Bigger juveniles and smaller adults: Changes in fish size correlate with warming seas

Idongesit E. Ikpewe | Alan R. Baudron



Gadus morhua



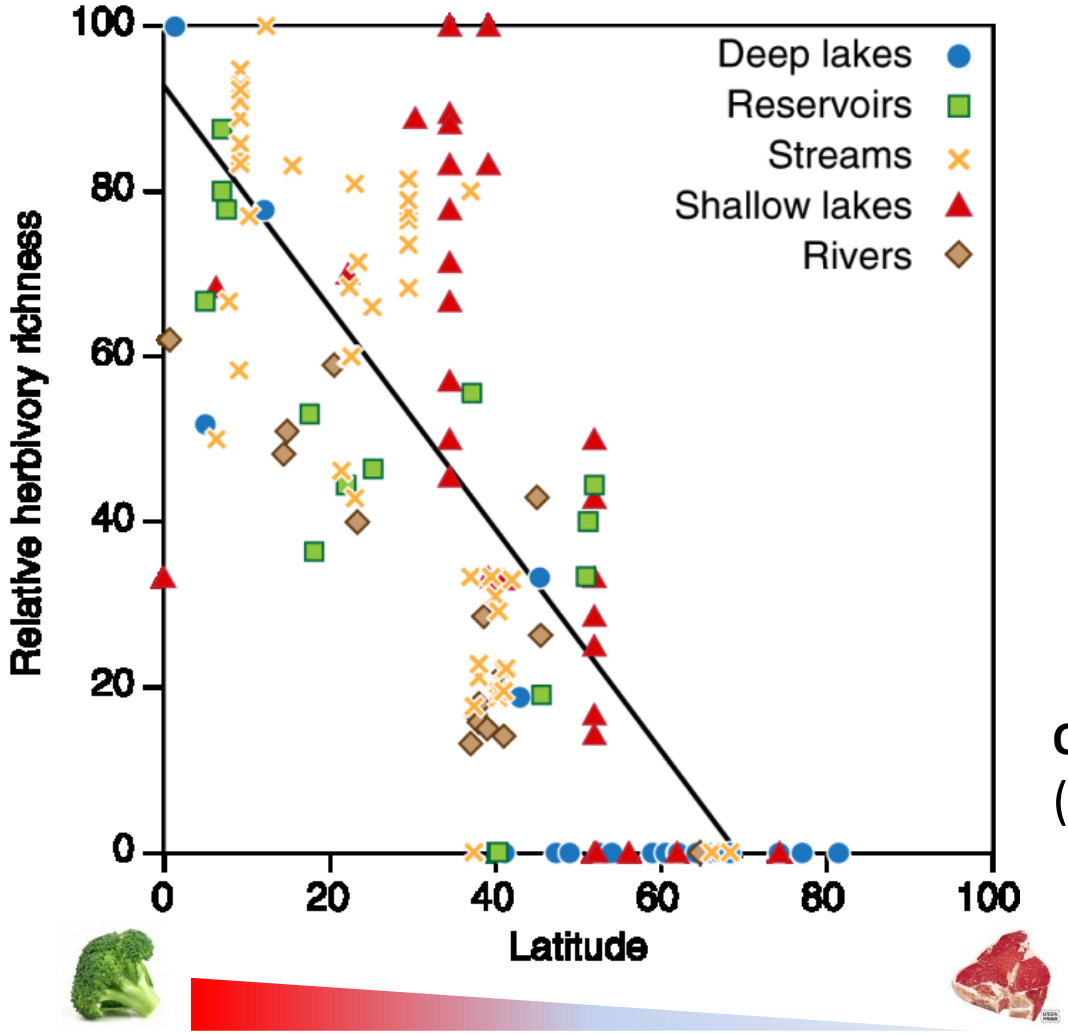
Melanogrammus aeglefinus

Merlangius merlangus

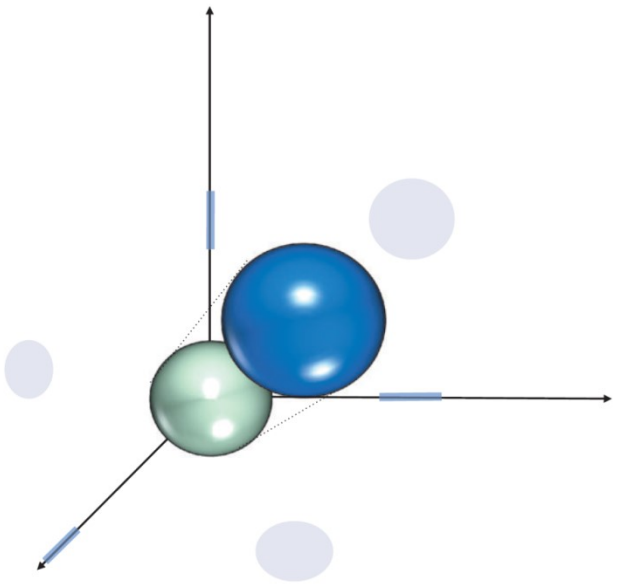
Pollachius virens

Efecto del calentamiento: aumento de herbivoría

Mayor % de especies de peces herbívoros en latitudes mas bajas



González- Bergonzoni et al 2012.



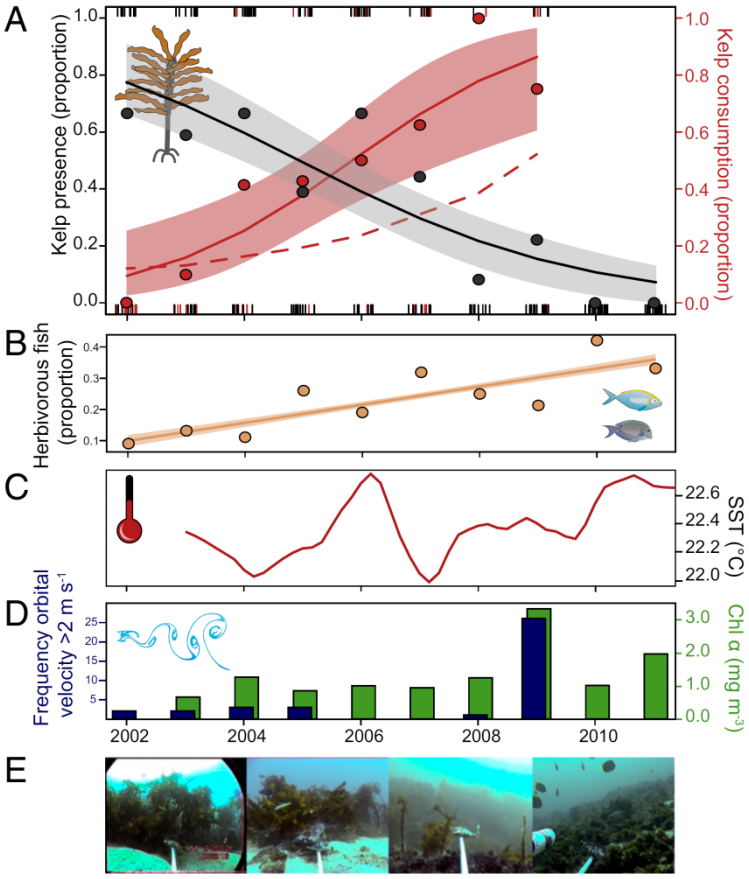
Organismos
(fisiológicos y comportamentales)

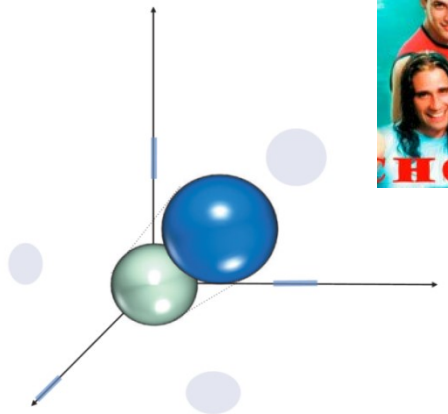
Evidencia a favor de la TCH

Long-term empirical evidence of ocean warming leading to tropicalization of fish communities, increased herbivory, and loss of kelp

Adriana Vergés[a,b,c,1], Christopher Doropoulos[a,d,e], Hamish A. Malcolm[f], Mathew Skye[a,b], Marina Garcia-Pizá[a,b], Ezequiel M. Marzinelli[a,b,c,g], Alexandra H. Campbell[a,b,c], Enric Ballesteros[h], Andrew S. Hoey[i], Ana Vila-Concejo[j], Yves-Marie Bozec[e,i], and Peter D. Steinberg[a,c,g]

[a]Centre for Marine Bio-Innovation, School of Biological, Earth, and Environmental Sciences, University of New South Wales, Sydney, NSW 2052, Australia;



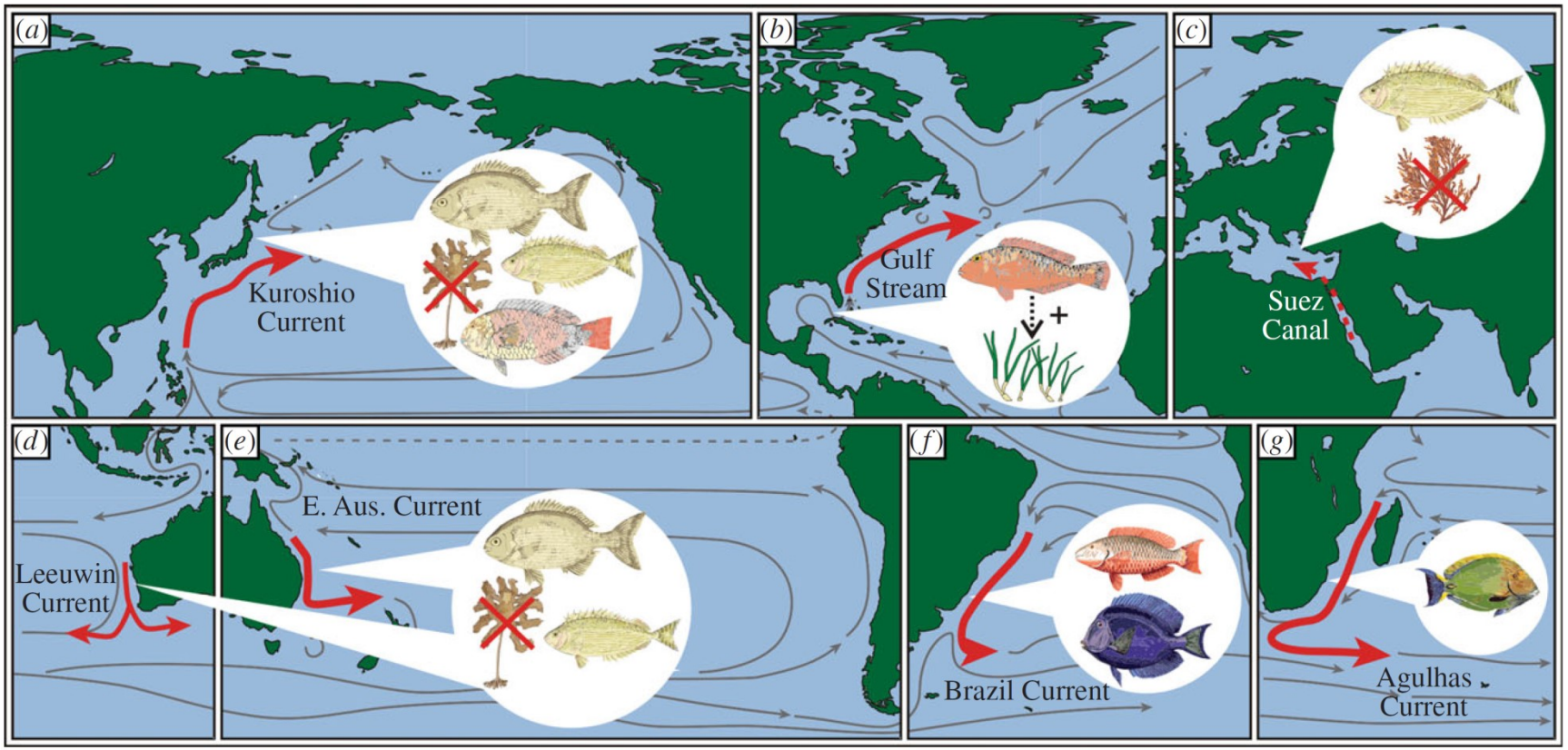


Espacio

Organismos

PROCEEDINGS OF THE ROYAL SOCIETY B

The tropicalization of temperate marine ecosystems: climate-mediated changes in herbivory and community phase shifts

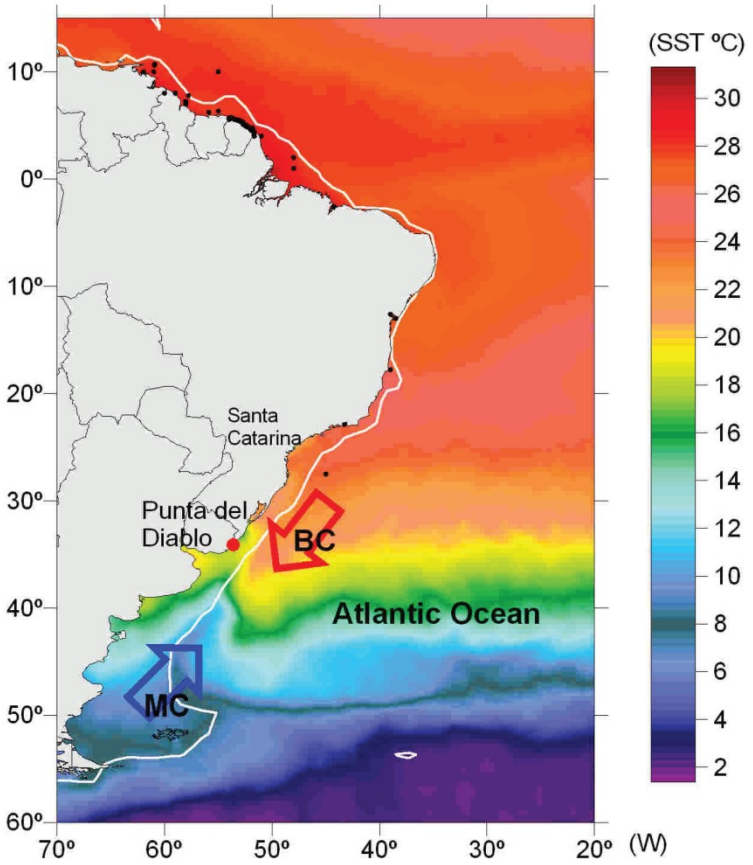


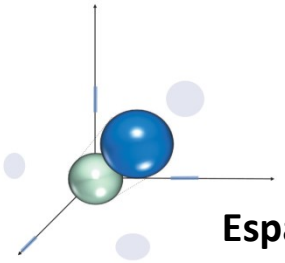
Verge´s et al. 2014

Cambios en la distribución de las especies

Stellifer rastrifer (Pisces: Sciaenidae): first Uruguayan records and a 1200 km range extension

A.M. Segura*§, A. Carranza†, L.E. Rubio, L. Ortega‡ and M. García∫

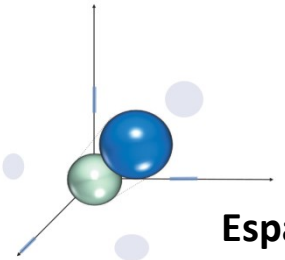




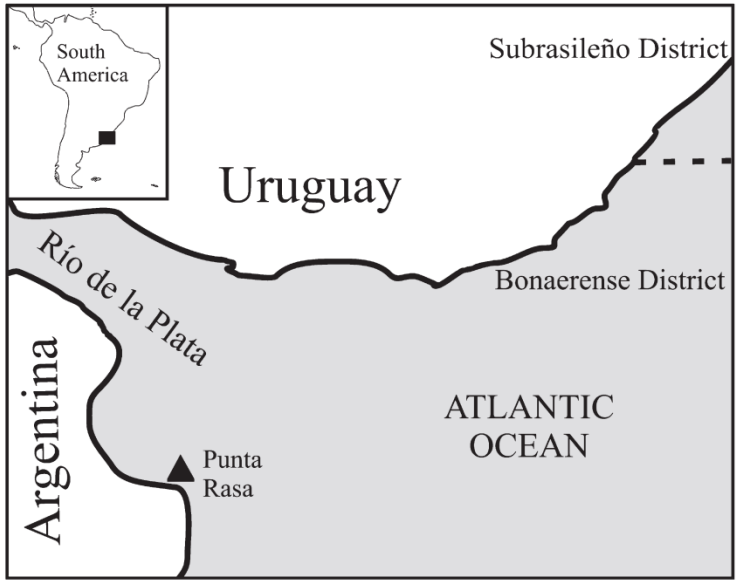
Espacio

First record of *Eucinostomus melanopterus*, Bleeker 1863 (Perciformes, Gerreidae) from the Río de la Plata estuary

By A. Solari[1], M. L. Garcia[1] and J. A. Jaureguizar[2]

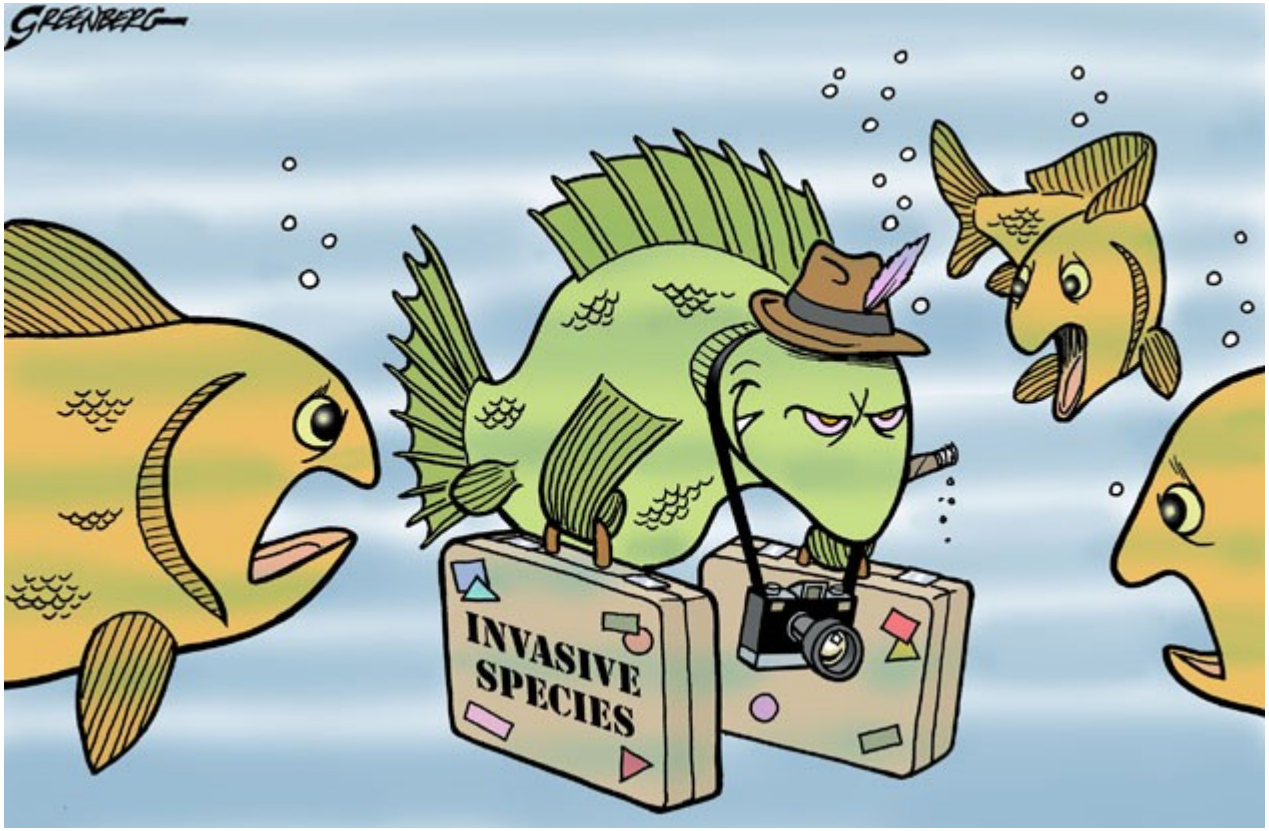


Espacio



Eucinostomus melanopterus

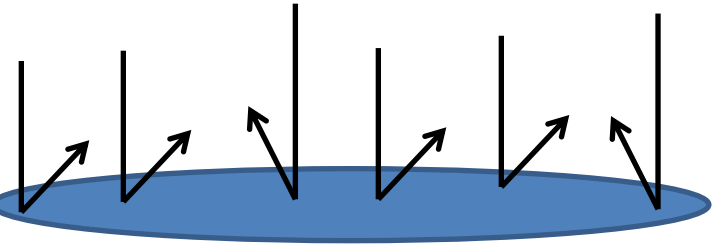
Interacción entre estresores
(cabio climático y especies invasoras)



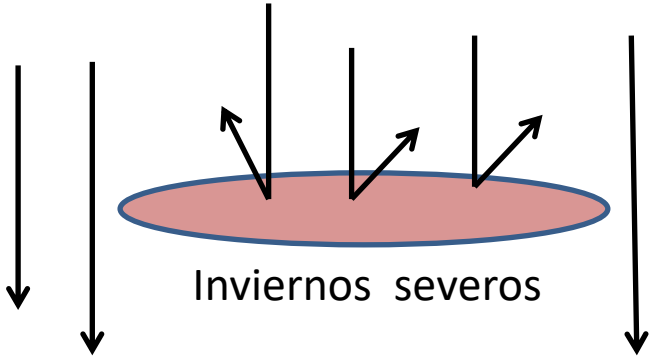
Assessing the Effects of Climate Change on Aquatic Invasive Species

FRANK J. RAHEL* AND JULIAN D. OLDEN†

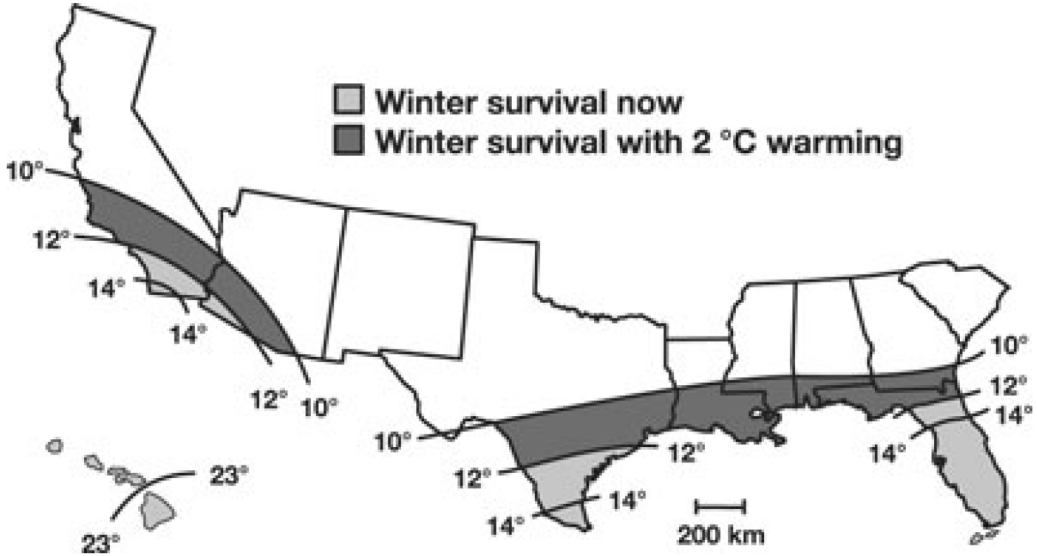
Especies invasoras



Hipoxia invernal



Inviernos severos



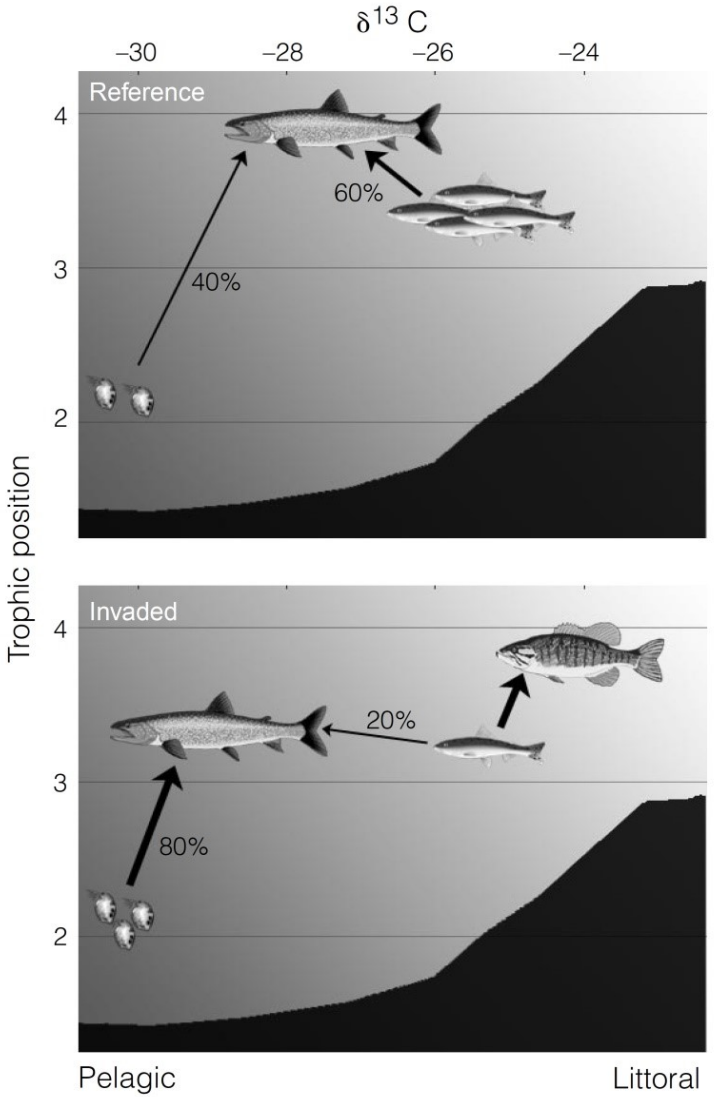
Stable isotope evidence for the food web consequences of species invasions in lakes

M. Jake Vander Zanden*‡, John M. Casselman† & Joseph B. Rasmussen*

Salvelinus namaycush

Micropterus dolomieu

Ambloplites rupestris

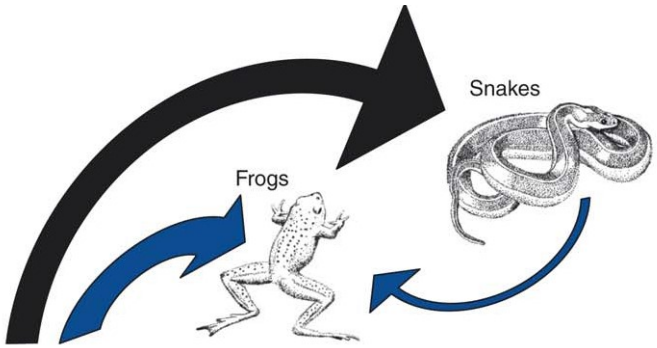


Vander Zanden et al., 1999

Ejemplo de efectos directos e indirectos de la introducción de especies

Lagos de montaña sin peces

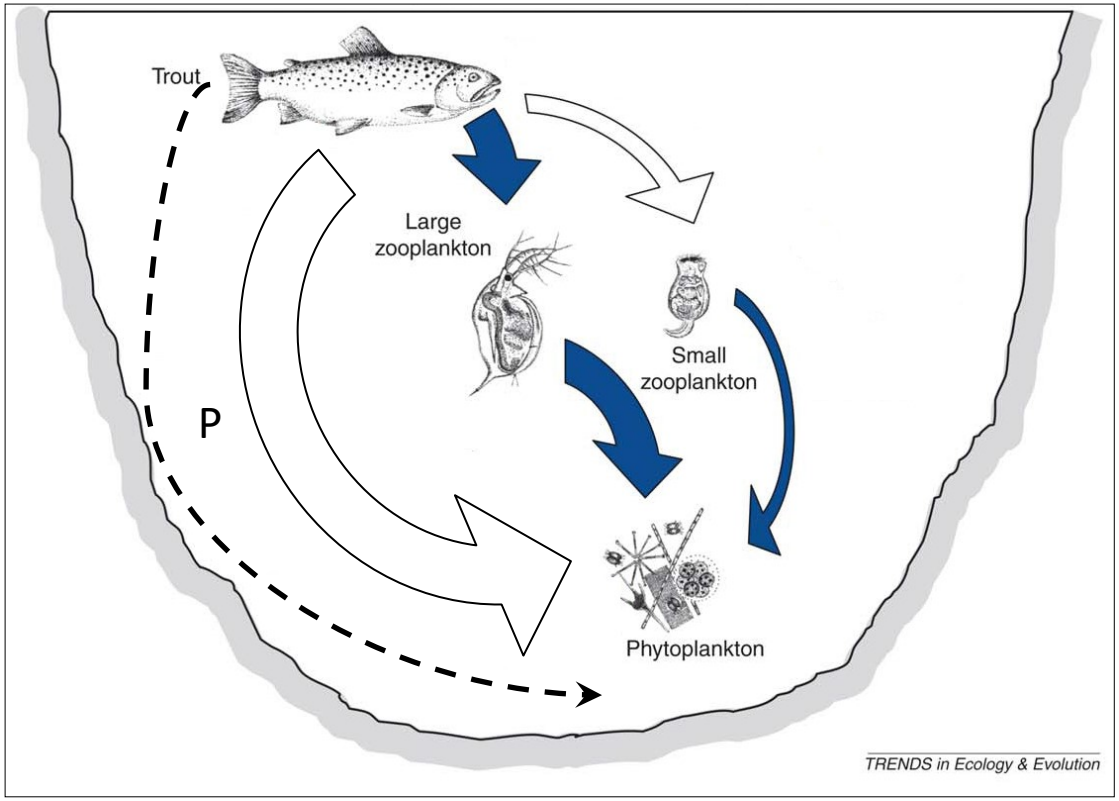
El efecto va a depender del rol trófico de la especie introducida



Indirecto (-)

Indirecto (+)

Consumo



Examples of introduced species direct and indirect effects

Nonnative trout impact an alpine-nesting bird by altering aquatic-insect subsidies

Peter N. Epanchin,[1,3] Roland A. Knapp,[2] and Sharon P. Lawler[1]

Terrestre

Acuático

Emergencia de insectos

98% reducción de ninfas

Epanchin et al., 2010.

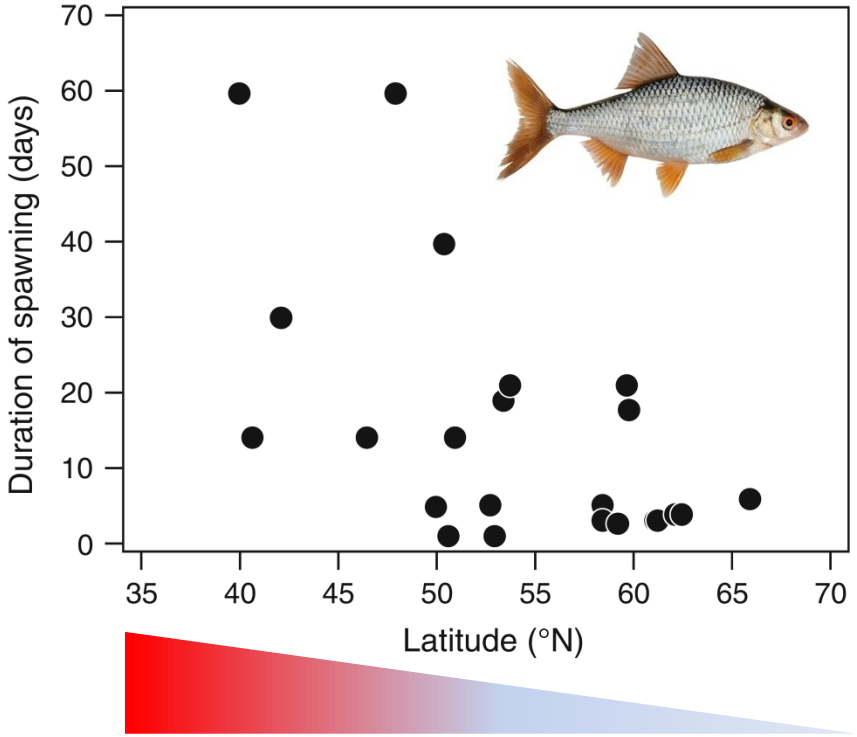
Efectos a nivel reproductivo

Latitudinal gradients in onset date, onset temperature and duration of spawning of roach

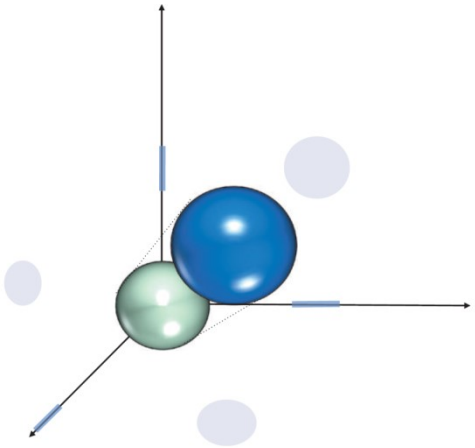
J. LAPPALAINEN*† AND A. S. TARKAN‡

*Department of Biological and Environmental Sciences, P. O. Box 65, FIN-00014 University of Helsinki, Finland and ‡Istanbul University, Faculty of Fisheries, Ordu Cad. No: 200, 34470, Laleli, Istanbul, Turkey

(Received 20 January 2006, Accepted 28 September 2006)



(Lappalainen & Tarkan 2007)



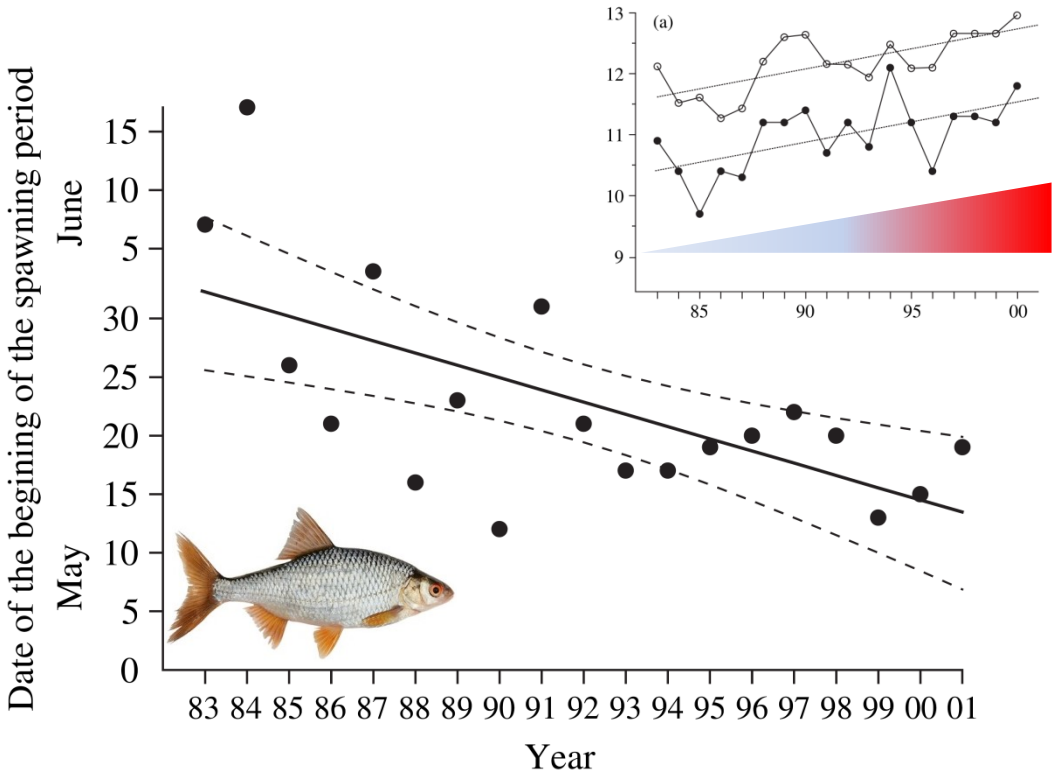
Tiempo
(fenológicos, ciclos de vida)

Effect of temperature changes on the reproductive cycle of roach in Lake Geneva from 1983 to 2001

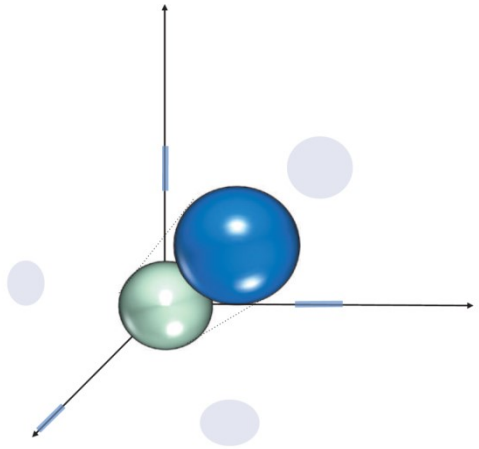
C. GILLET* AND P. QUÉTIN

Station d'Hydrobiologie Lacustre, BP 511, F 74203 Thonon Cedex, France

(Received 3 May 2005, Accepted 25 February 2006)

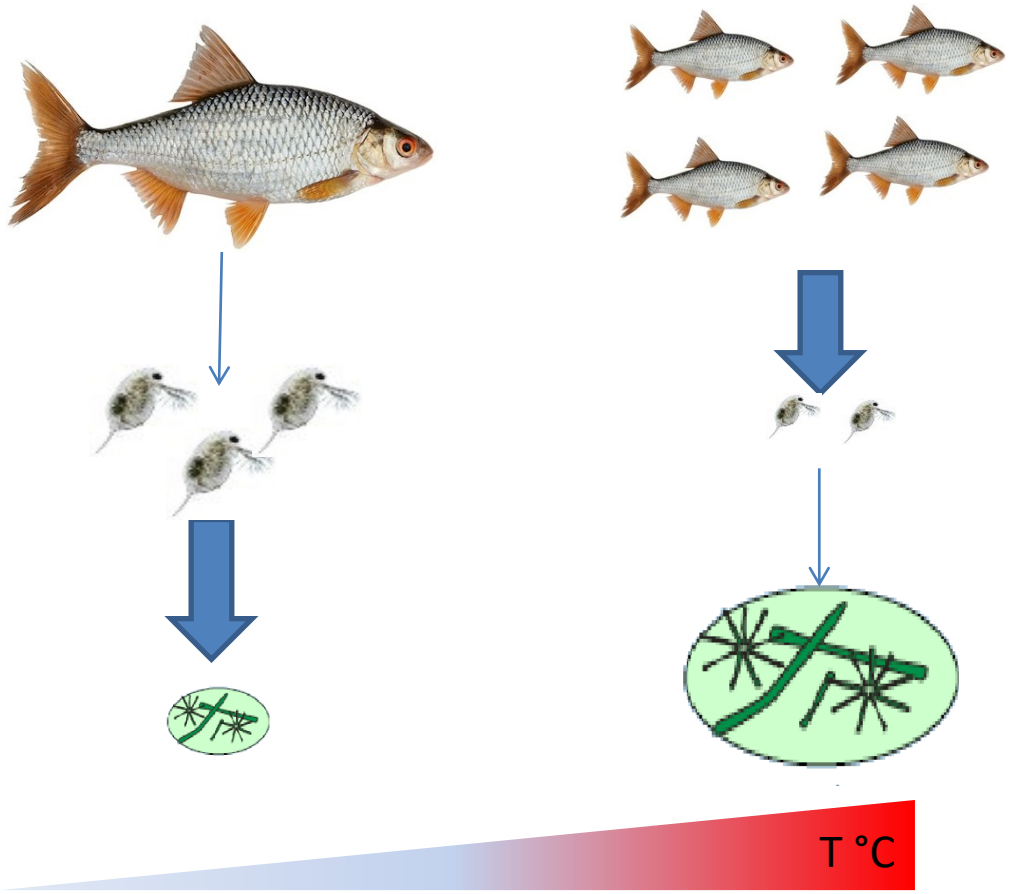


Gillet & Quetin 2006



Tiempo
(fenológicos, ciclos de vida)

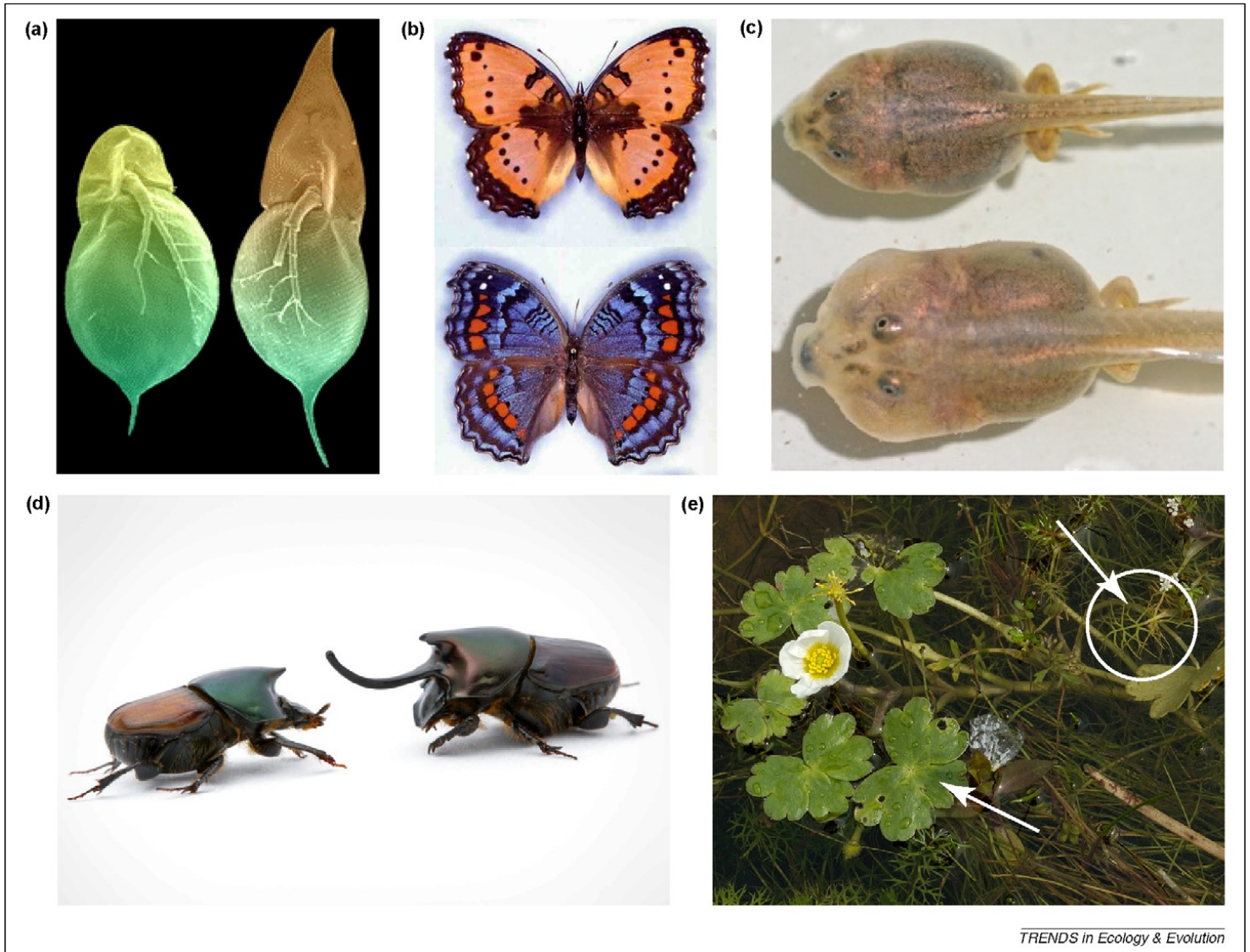
Cambios a nivel ecosistémico: Interacción con eutrofización



(Moss et al., 2011)

Plasticidad fenotípica

«Es la capacidad de un genotipo de producir diferentes fenotipos en respuesta a condiciones ambientales variables»



a) Daphnia cucullata

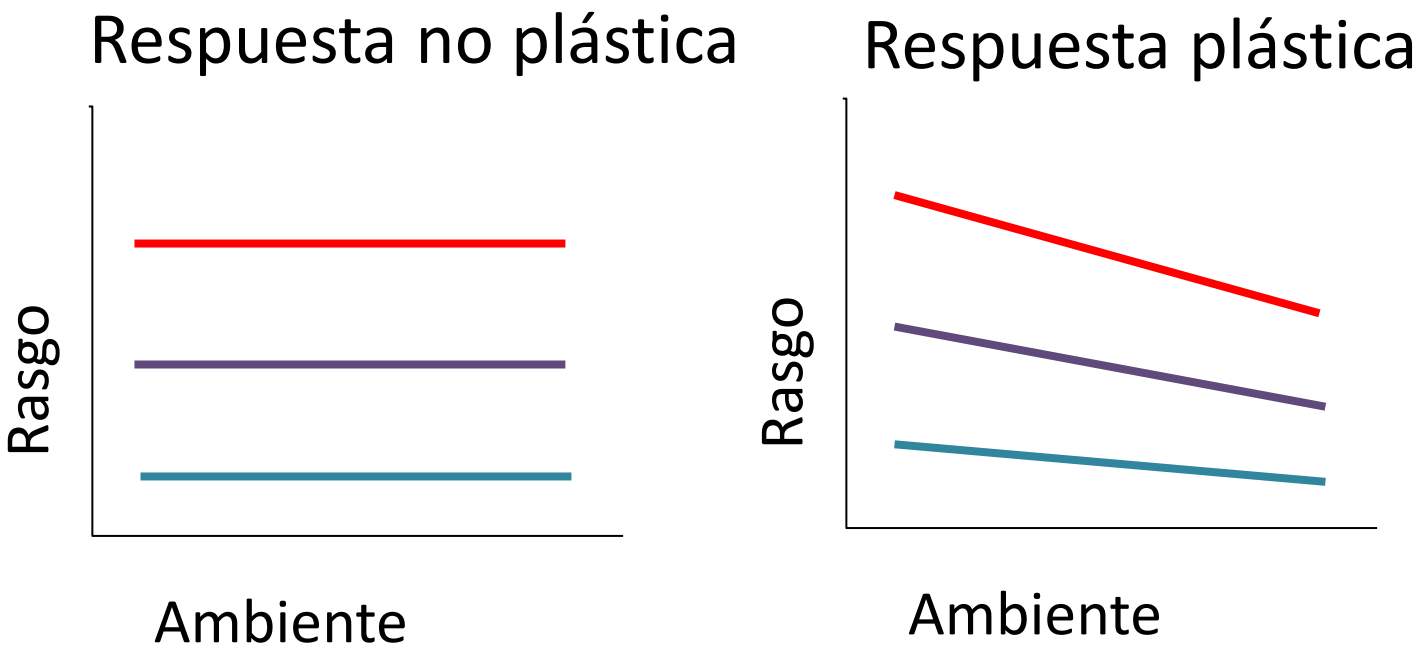
b) Precis octavia
Wet vs dry

c) Spea multiplicata

d) Onthophagus nigriventris

e) Ranunculus aquatilis

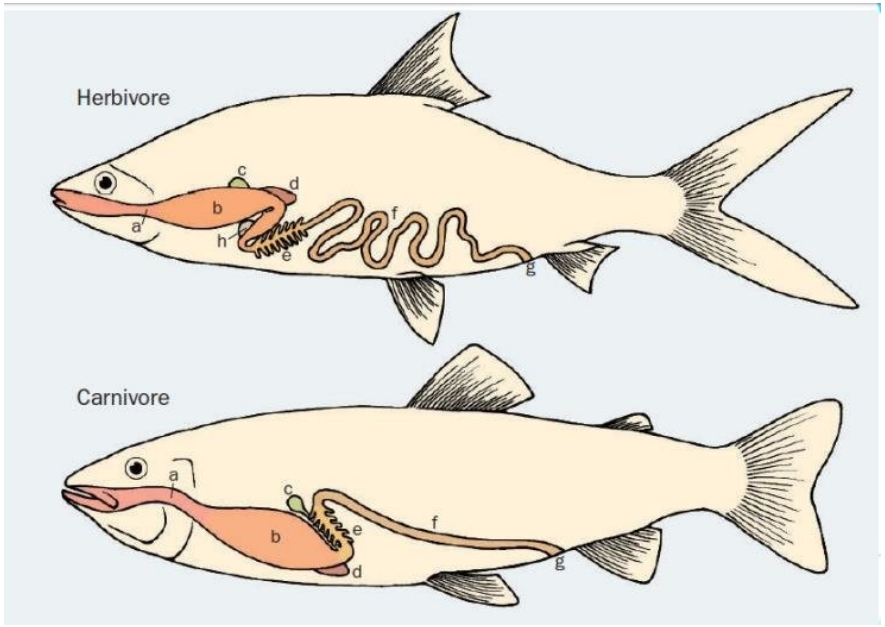
Plasticidad fenotípica

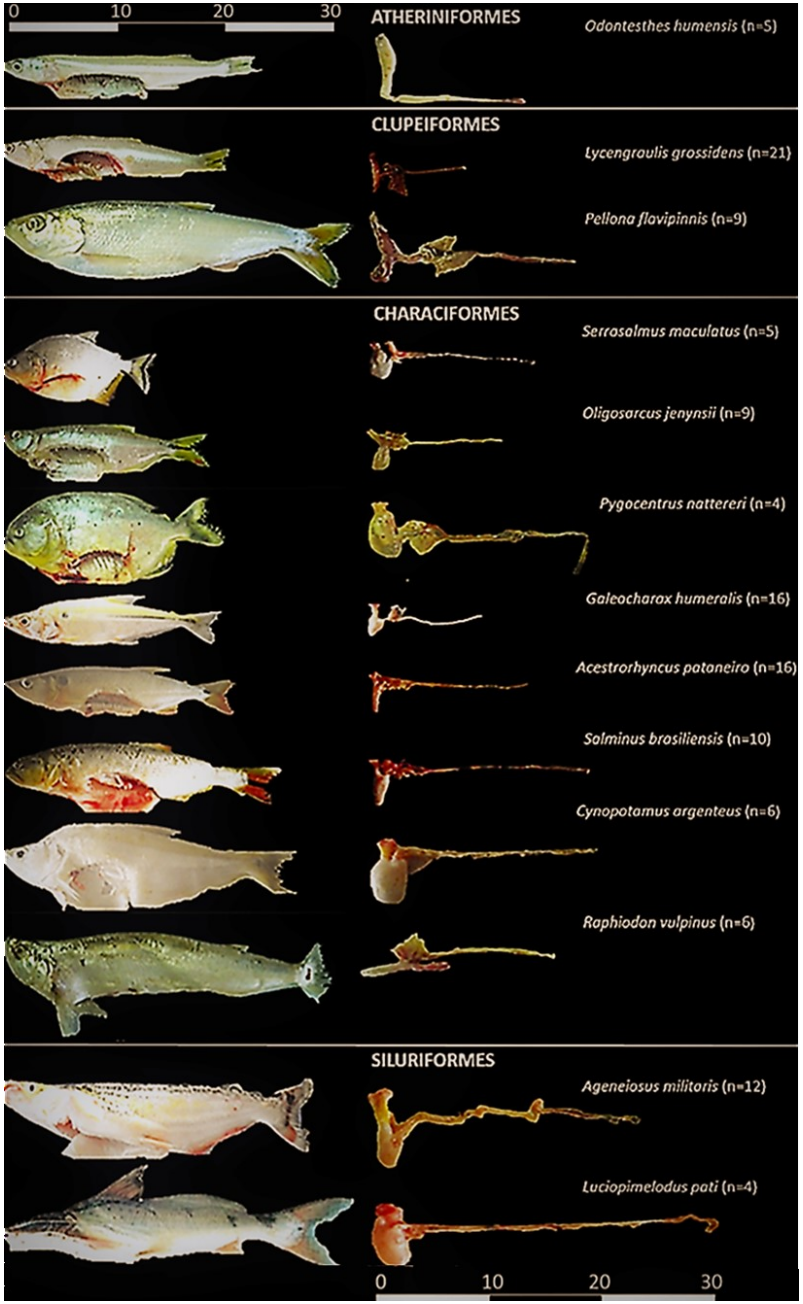


Modelos para predecir el CC no incluyen respuestas plásticas

Plasticidad del digestivo

Una de las predicciones de la Teoría Digestiva indica que individuos que consumen mayor % de alimento difícil de digerir requieren mayor tiempo de digestión y por lo tanto tractos digestivos mayores



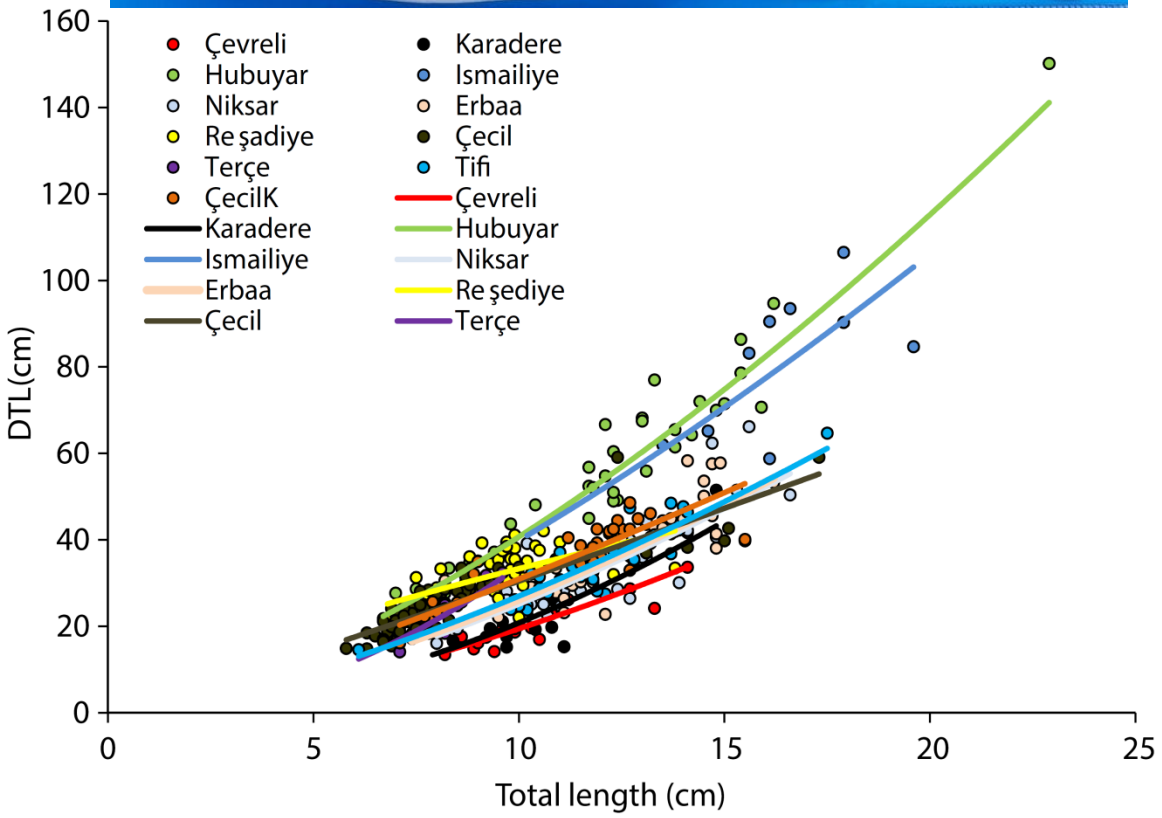


Silva, 2018

Journal of
Applied Ichthyology

Does diet variation determine the digestive tract length of *Capoeta banarescui* Turan, Kottelat, Ekmekci and Imamoglu, 2006?

By S. Akin, H. Turan and N. Kaymak



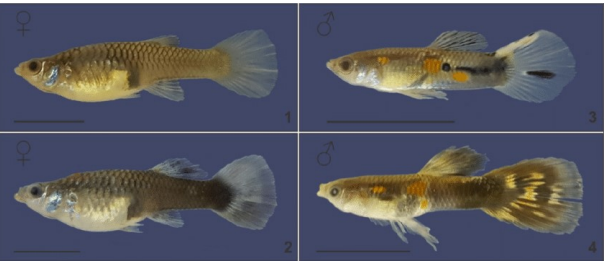
Hubuyar

Algae

Çevreli

Chironomidae

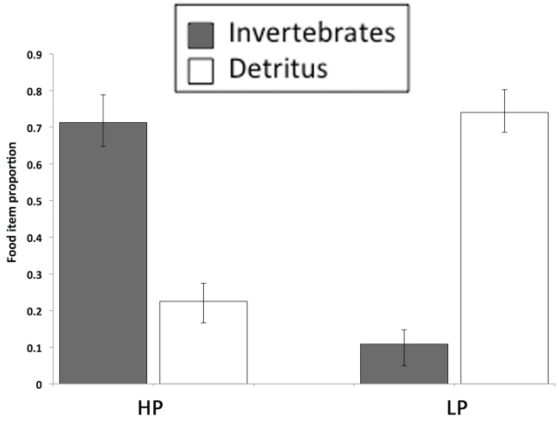
PLOS ONE

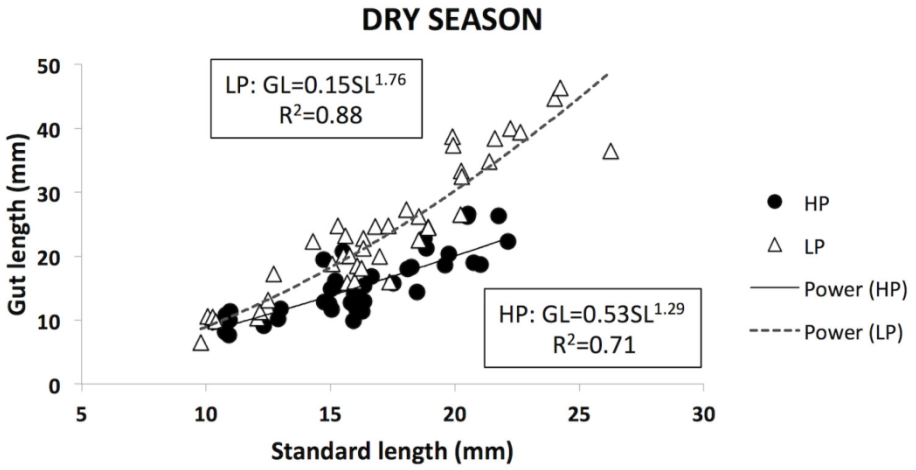


RESEARCH ARTICLE

Contrasting Population and Diet Influences on Gut Length of an Omnivorous Tropical Fish, the Trinidadian Guppy (*Poecilia reticulata*)

Eugenia Zandonà[1¤a*], Sonya K. Auer[2¤b], Susan S. Kilham[1], David N. Reznick[2]





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