

# GOODEIDS

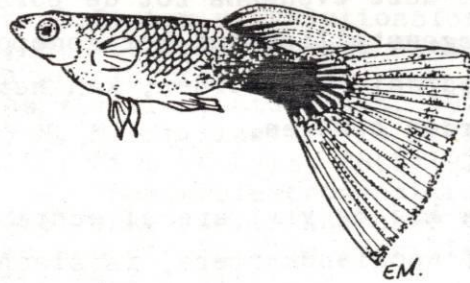
KEES DE JONG

GWG

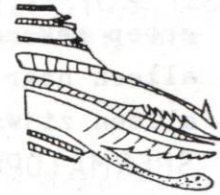
OCTOBER 2011



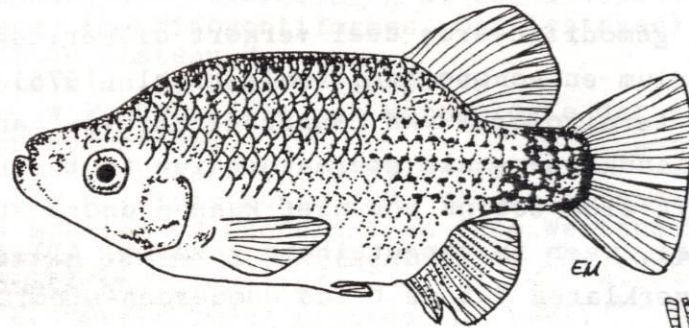
Gonopodium



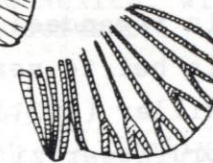
Poecilia



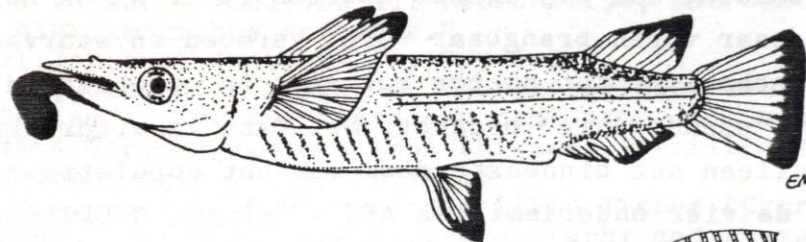
Andropodium



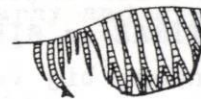
Xenotoca



Spermatopodium

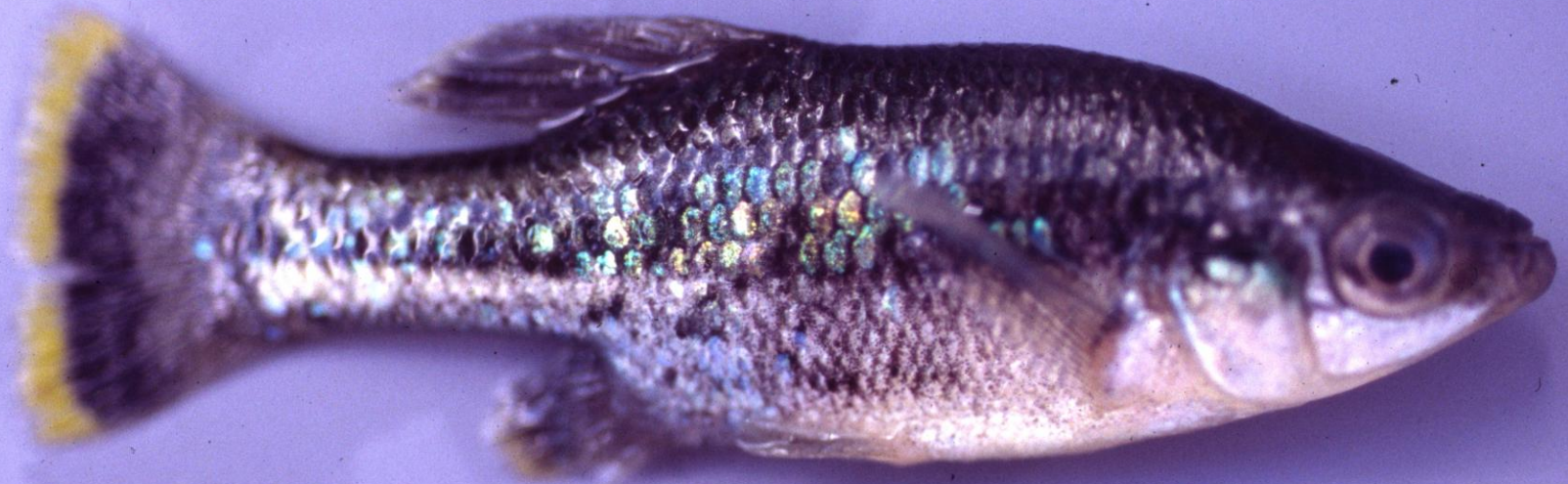


Nomorhamphus





*Xenotoca eiseni*



*Ameca splendens*

# KILLIFISCHE AUS ALLER WELT



Band 8

A. C. RADDA

Synopsis der Goodeiden Mexikos



# Distribution of goodeids



Abb. 3: Verteilung der Gattungen der Goodeidae. Nur am Rande des Verbreitungszentrums liegende Fundortlokalitäten wurden für jede Gattung einzeln angegeben. 1 *Characodon*, 2 *Xenophorus*, 3 *Goodea*, 4 *Ataeniobius*, 5 *Xenotoca*, 6 *Allotoca* (*Allotoca*), 7 *Skiffia*, 8 *Hubbsina*, 9 *Girardinichthys*, 10 *Zoogoneticus* und *Allotoca* (*Neophorus*), 11 *Ilyodon*, 12 *Allodontichthys*, 13 *Xenotaenia*, 14 Gebiet größter Konzentration von Gattungen 10/16, 15 Gebiet der Konzentration von *Ilyodon*. Gattungen in 14 sind *Allodontichthys*, *Allophorus*, *Allotoca*, *Ameca*, *Chapalichthys*, *Goodea*, *Ilyodon*, *Skiffia*, *Xenotoca* und *Zoogoneticus*. Aus UYENO et al. (1983).

# POPULATION DENSITY OF MEXICO



# Local extinction of species

*Skiffia francesae*



*Zoogoneticus tequila*



*Girardinichthys viviparus*



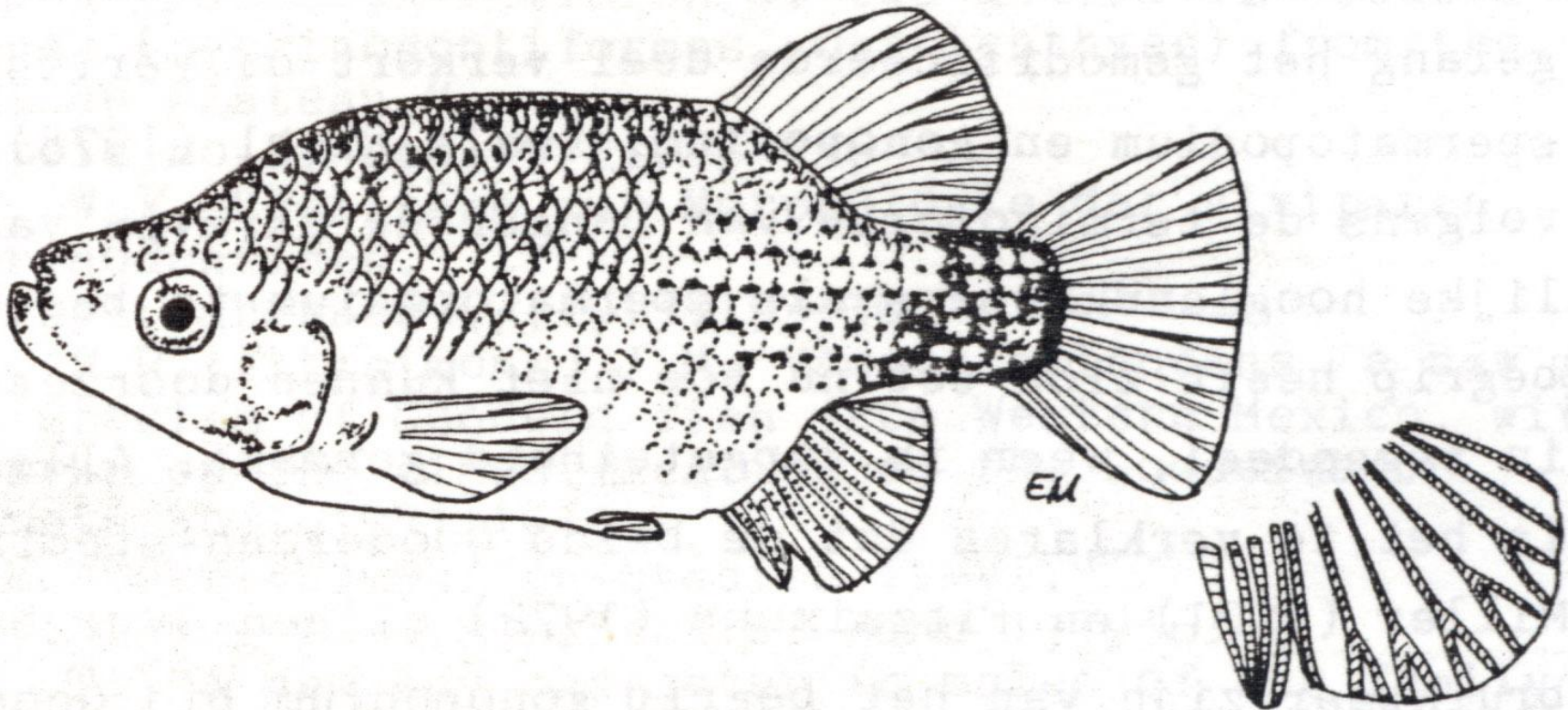




*Ilyodon furcidens*

Andropodium

Xenotoca



# Males

## Andropodium (copulation organ)

- First six or seven rays of the anal fin
- Develops in one (*Girardinichthys*) to 10 weeks (most species)
- Different in each species
  - Primitive: *Ataeniobius*
  - Evolved: *Girardinichthys*



# Males

- Males are typically 85-90% as long as females
- In some species ornamented:
  - Higher fins
  - More colourful, flank colour

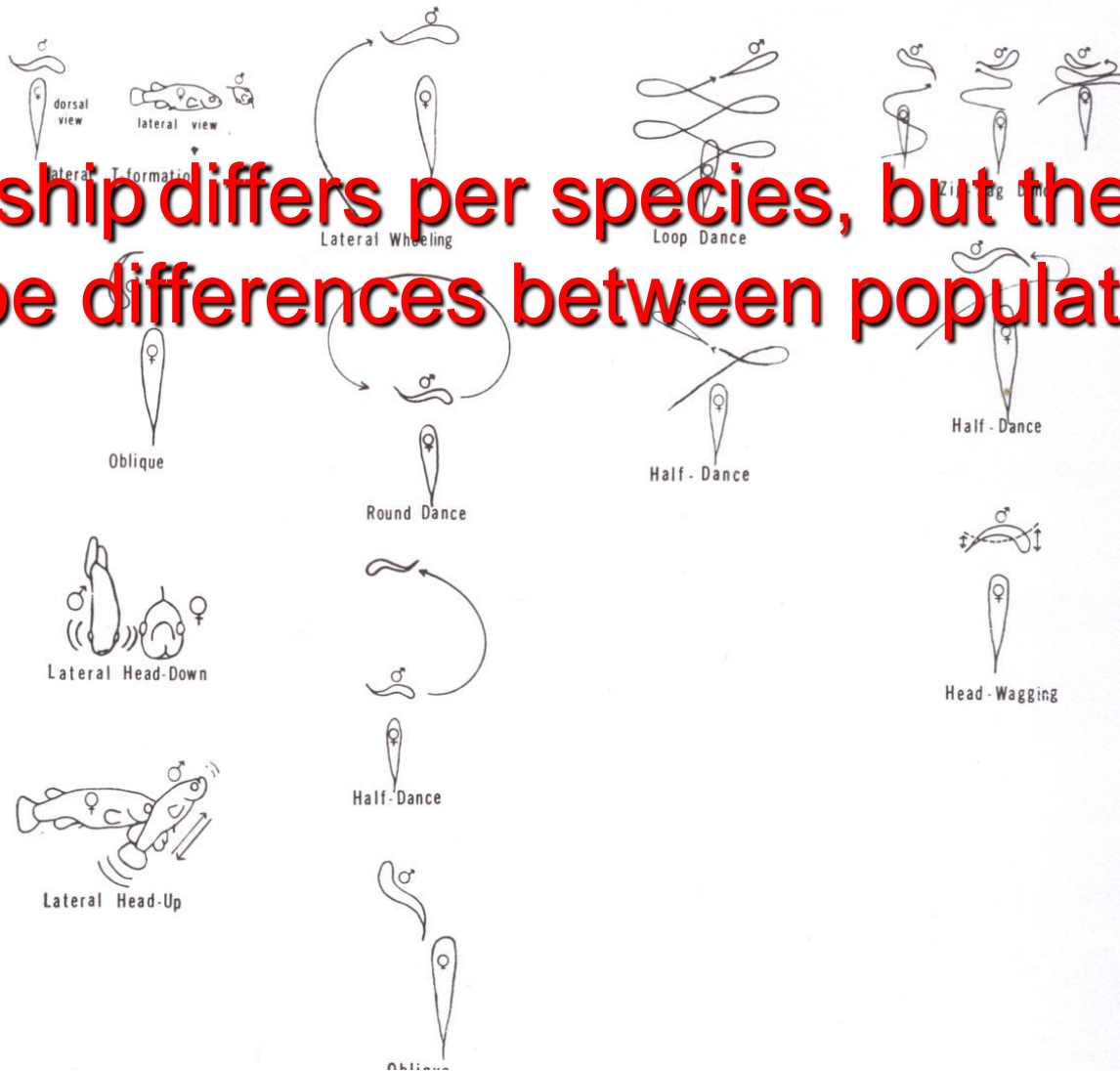


C. lateralis

X. variata

X. eiseni

X. melanosoma



**Courtship differs per species, but there can also be differences between populations**

**Courtship of goodeids  
(FITZSIMONS 1972)**

# Critical females (1)\*

- Fertile in the first week after parturition
- Prefer males with courtship and highly ornamented males (fins, flank colour)
- Larger males show more courtship
- Fail to get pregnant if the largest male is < 75% of their own size or if they receive little courtship



*Allotoca dugesii*



*Skiffia lermae*



*Neotoca bilineata*

# Critical females (2)

- Without a good partner, no mating
- Become infertile if they miss reproductive period
- Aggression between females when no males available



# Critical females (3)

- No storage of sperm
- Offspring of more than one male in one brood (multiple paternity)
- Small/young females give bigger fry
- Older females do not reproduce anymore
- Females “vibrate” when they are challenged, this costs a lot of energy





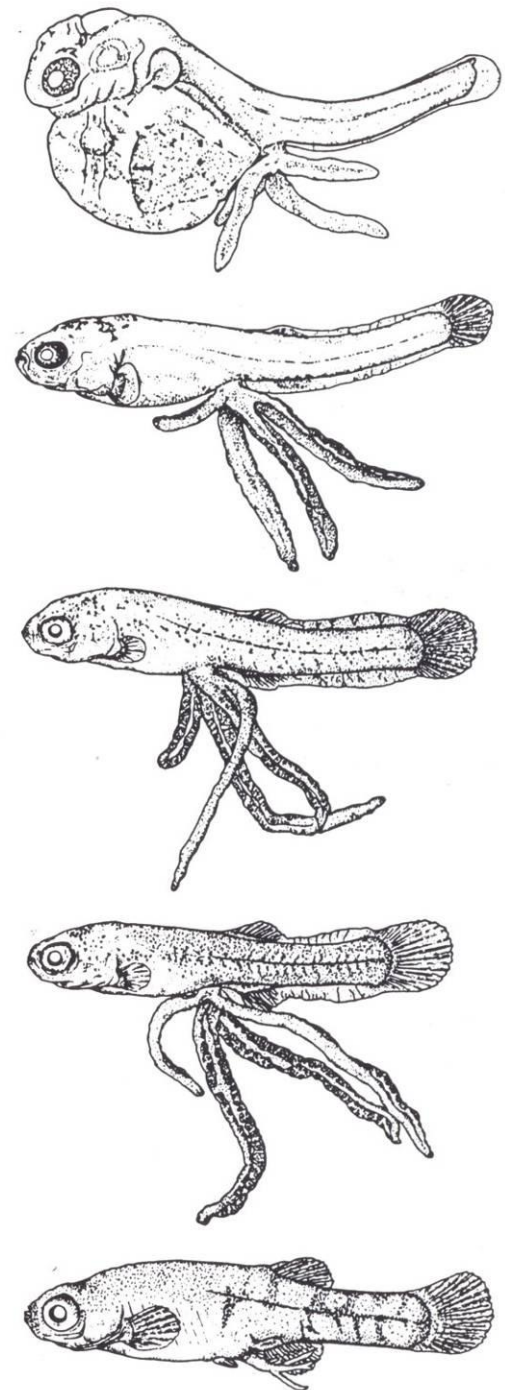
# Critical females (4)



Introduced guppy males, chase the females of  
*Neotoca bilineata*

# Fry

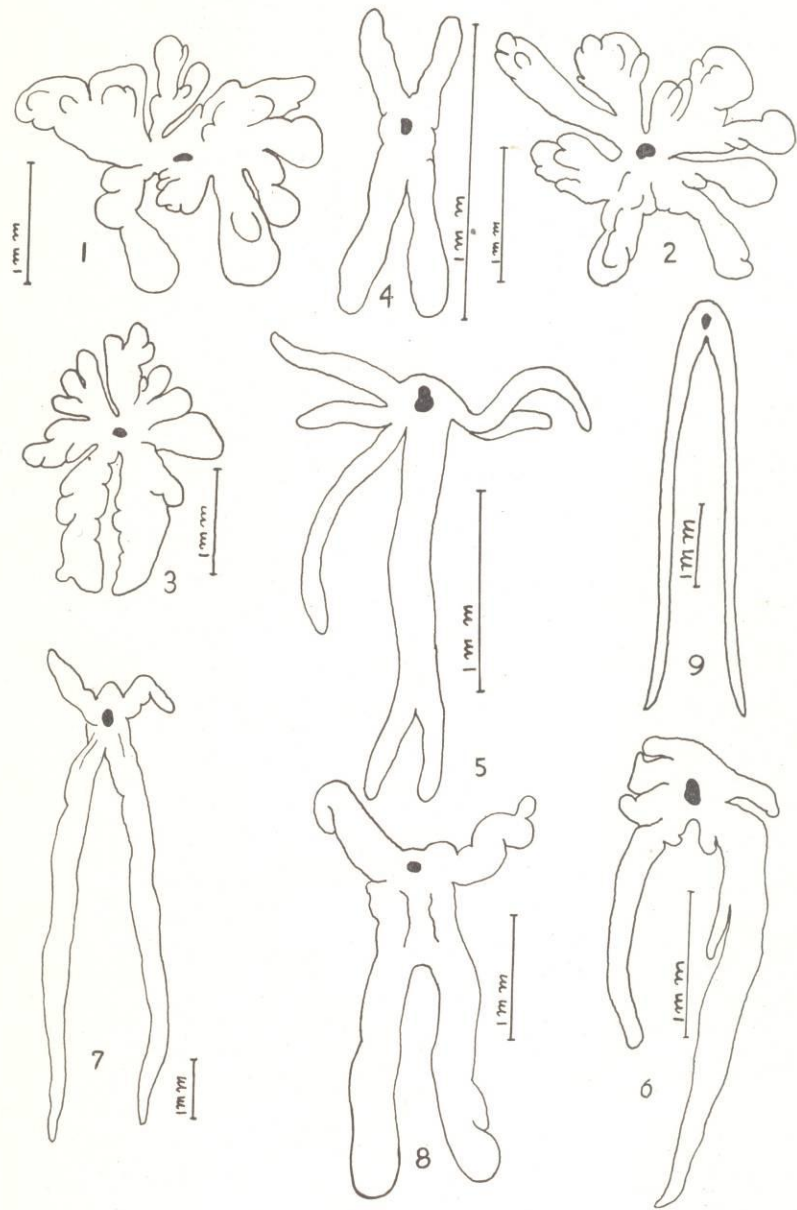
- Weight from egg → Fish
  - *Goodea* + 13x
  - *Ameca* + 150x
- Cannibalism in Ovarium



# Trophotaenia

(anal rosette)

Different for each  
species



1. & 2. *Goodea*, 3. *Allotoca* (*Neophorus*) *diazi*  
4. *Allotoca* (*A.*) *dugesii* 5. & 6. *Xenophorus*  
7. *Girardinichtys viviparus* 8. *G. multiradiatus*  
9. *Characodon lateralis*

Hubbs & Turner 1939

MISCELLANEOUS PUBLICATIONS  
MUSEUM OF ZOOLOGY, UNIVERSITY OF MICHIGAN, NO. 42

STUDIES OF THE FISHES OF THE  
ORDER CYPRINODONTES.  
XVI. A REVISION OF THE  
GOODEIDAE

BY  
CARL L. HUBBS AND C. L. TURNER

ANN ARBOR  
UNIVERSITY OF MICHIGAN PRESS  
NOVEMBER 9, 1939



*Characodon lateralis*



*Characodon lateralis*



*Characodon lateralis*



*Characodon lateralis*





*Characodon lateralis*



***Characodon  
audax***



***Girardinichthys multiradiatus***

# Related species



*Girardinichthys viviparus*

**Genus: *Girardinichthys* or *Hubbsina*?**



**Species: *turneri* DE BUEN 1940**

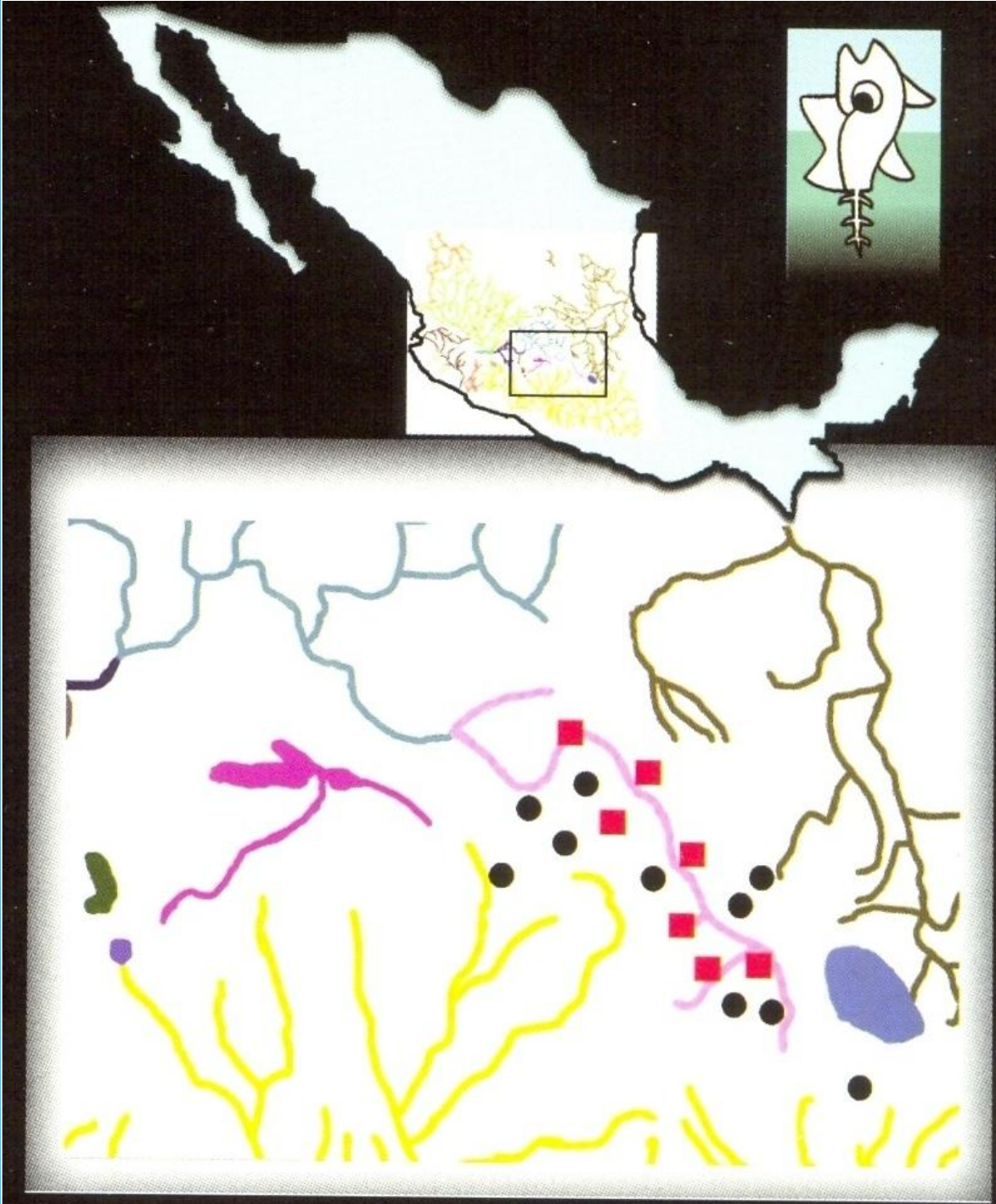
**And/or *ireneae* RADDA & MEYER 2003??**

# *Girardinichthys multiradiatus*

## Distribution:

- Localized the last six years
- Not localized the last six years

The last years more than 50% of the location disappeared. The species is endangered.



# Maravatio



**Maravatio 2002**







**Maravatio 2007**

# Maravatio 2007





***Girardinichthys multiradiatus***  
**Maravatio**



**Maravatio 2007**



***Girardinichthys multiradiatus***

**Maravatio**



***Goodea atripinnis* Maravatio**

*Notropis marhabatiensis*





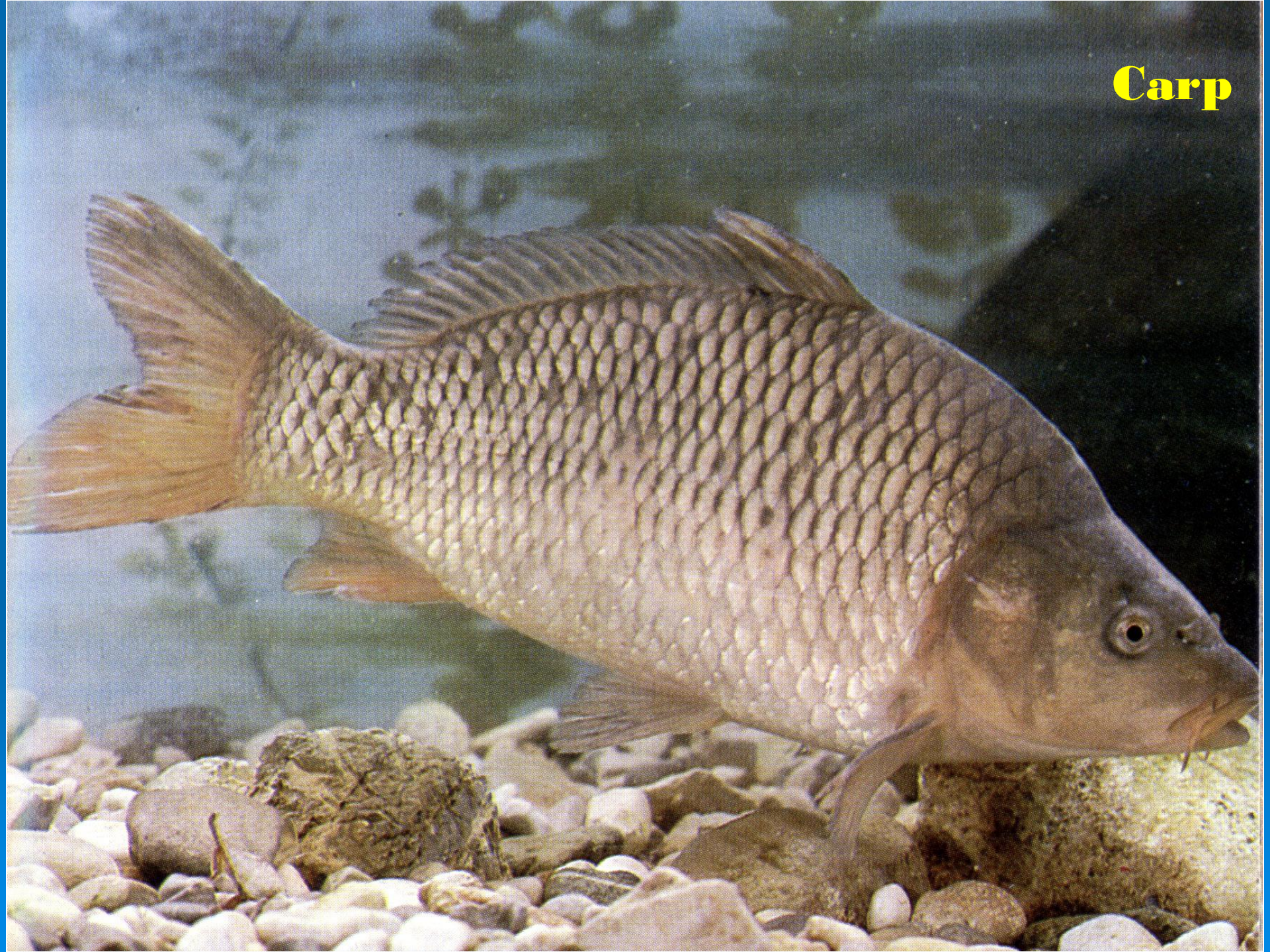
***Tilapia Maravatio***





**Maravatio 2002**

**Carp**





***Pseudoxiphophorus bimaculatus***  
**Maravatio**

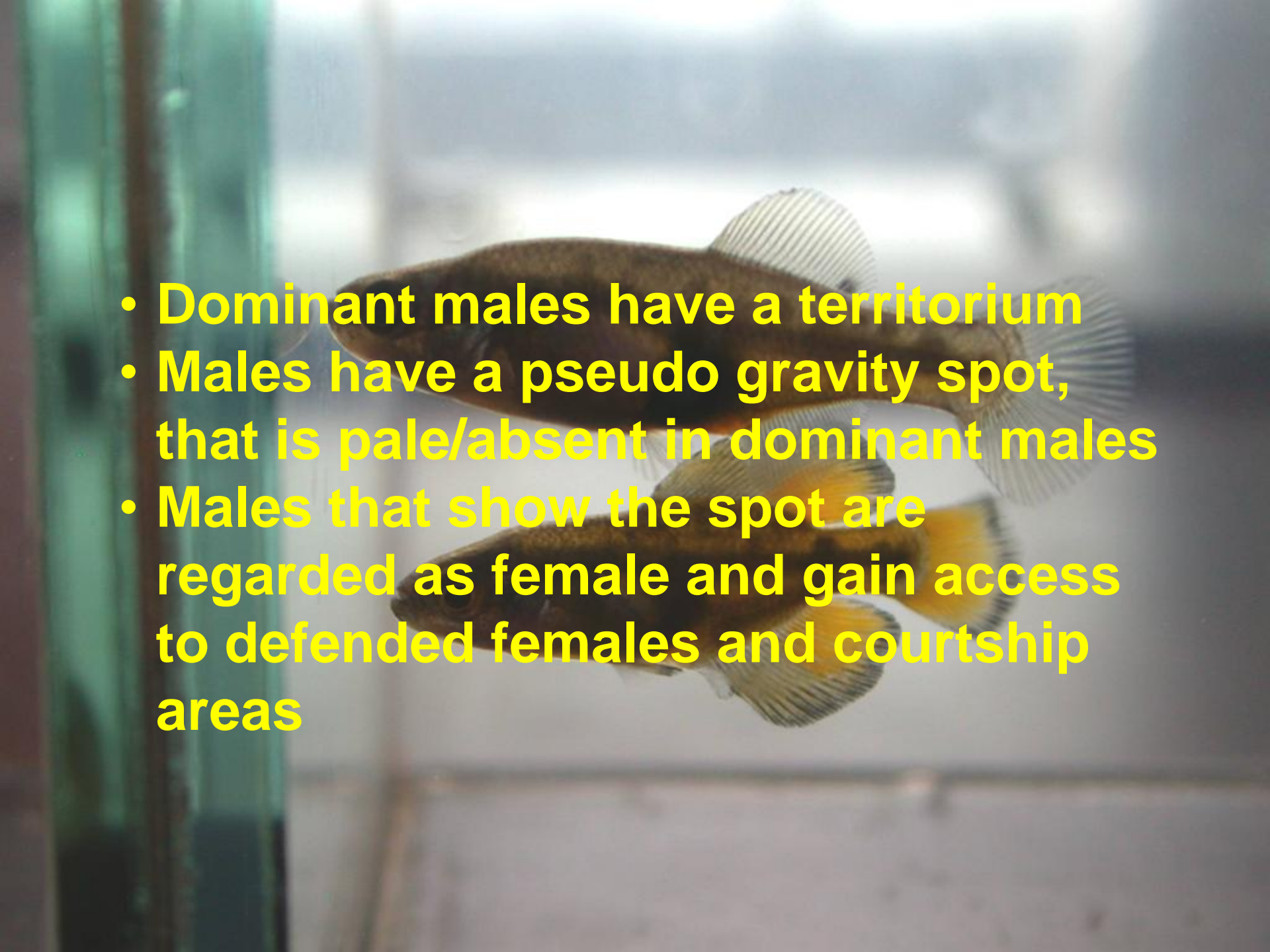


***Poecilia mexicana***

*Thamnophis melanogaster*



• Predator eats more males with bigger fins

- 
- The image shows two fish in an aquarium. The top fish is a dark brown color with a lighter, almost white, spot on its side, which is the 'pseudo gravity spot'. The bottom fish is a similar color but has a prominent yellow spot on its side. The text overlay explains that dominant males lack this spot, while males with the spot are regarded as females and gain access to defended territories and courtship areas.
- **Dominant males have a territorium**
  - **Males have a pseudo gravity spot, that is pale/absent in dominant males**
  - **Males that show the spot are regarded as female and gain access to defended females and courtship areas**

# Goodeids in the aquarium

- Maintain in a group, and keep a mixed population when it is established
- Lower water temperatures. Outdoor summer breeding.
- Shelter for fry, otherwise separate females
- Know your fish!



# Goodeids in the aquarium

- A cooler period is recommended
- Adjust the amount of food during cooler time
- Make sure to keep younger females
- A special tank per species works best



# Goodeids in the aquarium

**Change the water of your tank  
on a regular base**



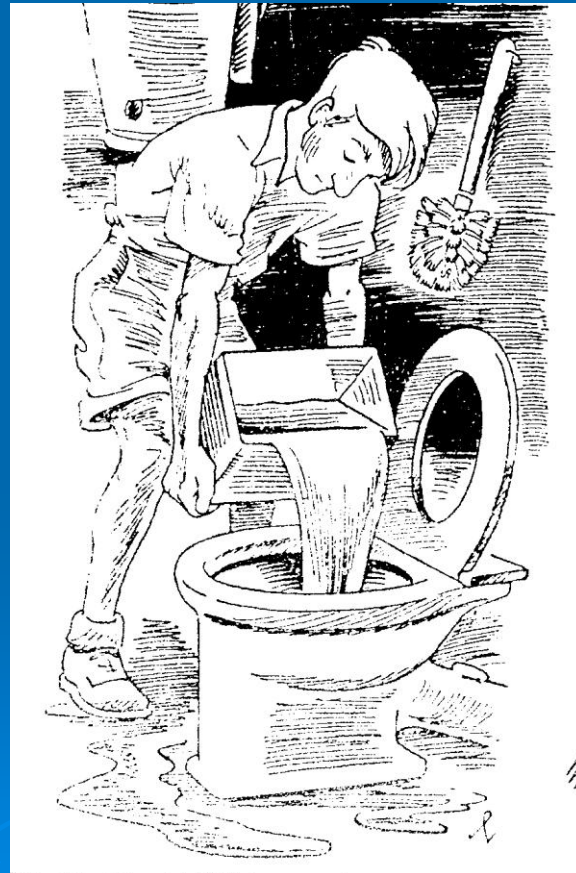


Quitzeo



*Neotoca bilineata*

# Make waterchanges regular



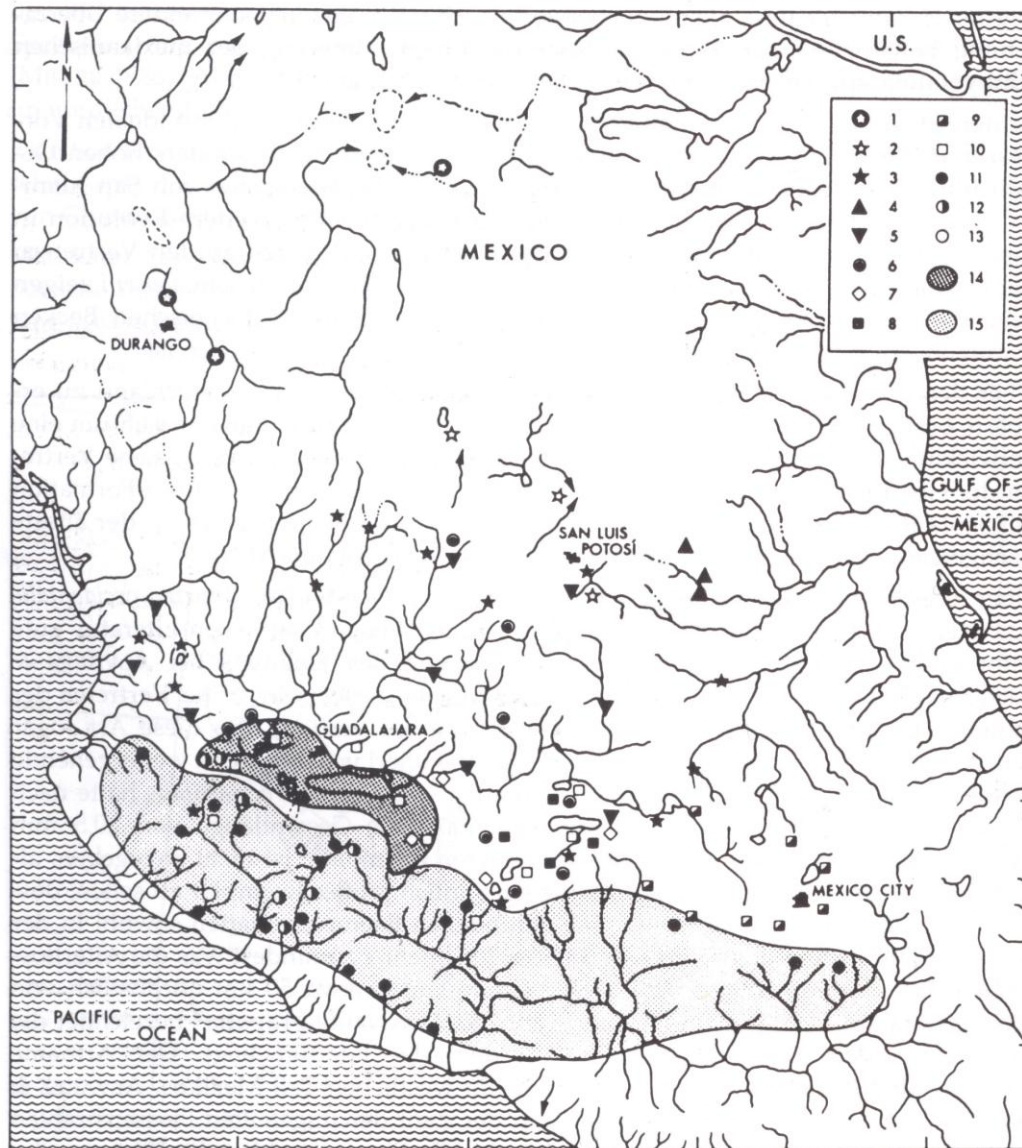


Abb. 3: Verteilung der Gattungen der Goodeidae. Nur am Rande des Verbreitungszentrums liegende Fundortlokalitäten wurden für jede Gattung einzeln angegeben. 1 *Characodon*, 2 *Xenoporphus*, 3 *Goodea*, 4 *Ataniobius*, 5 *Xenotoca*, 6 *Allotoca* (*Allotoca*), 7 *Skiffia*, 8 *Hubbsina*, 9 *Girardinichthys*, 10 *Zoogoneticus* und *Allotoca* (*Neoporphus*), 11 *Ilyodon*, 12 *Allodontichthys*, 13 *Xenotaenia*, 14 Gebiet größter Konzentration von Gattungen 10/16, 15 Gebiet der Konzentration von *Ilyodon*. Gattungen in 14 sind *Allodontichthys*, *Alloophorus*, *Allotoca*, *Ameca*, *Chapalichthys*, *Goodea*, *Ilyodon*, *Skiffia*, *Xenotoca* und *Zoogoneticus*. Aus UYENO et al. (1983).

*Goodea atripinnis*





**Patzquaro**



*Goodea atripinnis*



**La Luz**





*Chapalichthys encaustus*



*Skiffia multipunctata* female



*Skiffia multipunctata* male



*Allophorus robustus*



*Poeciliopsis infans*



***Zoogoneticus purhepechus***

**DOMÍNGUEZ-DOMÍNGUEZ, PÉREZ-RODRÍGUEZ & IGNACIO 2008**



## *Zoogoneticus* complex



*Z. purhepechus*

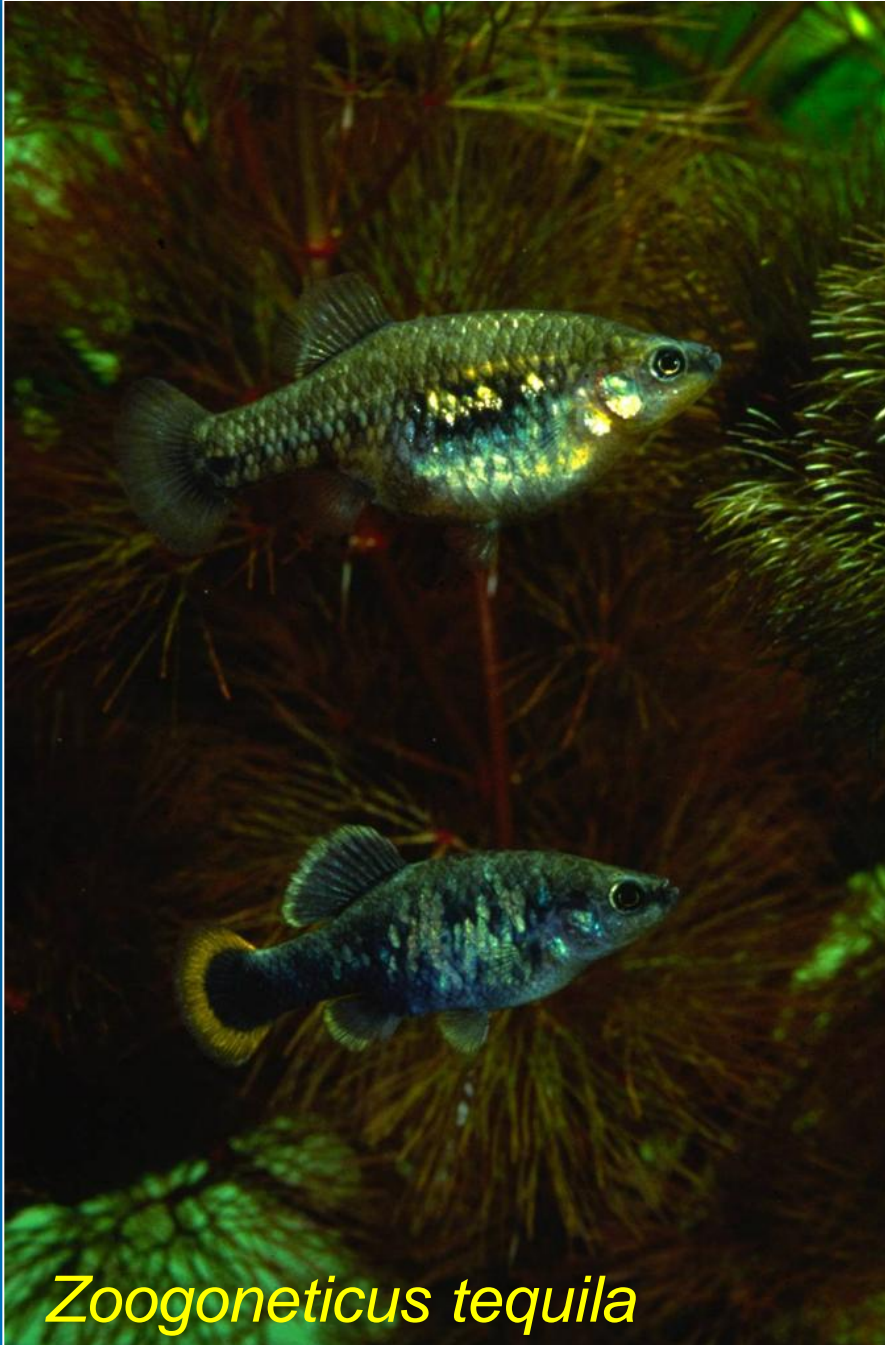


*Z. quitzeoensis*



*Z. tequila*





*Zoogoneticus tequila*



Teuchitlán



***Tilapia***





*Platy*

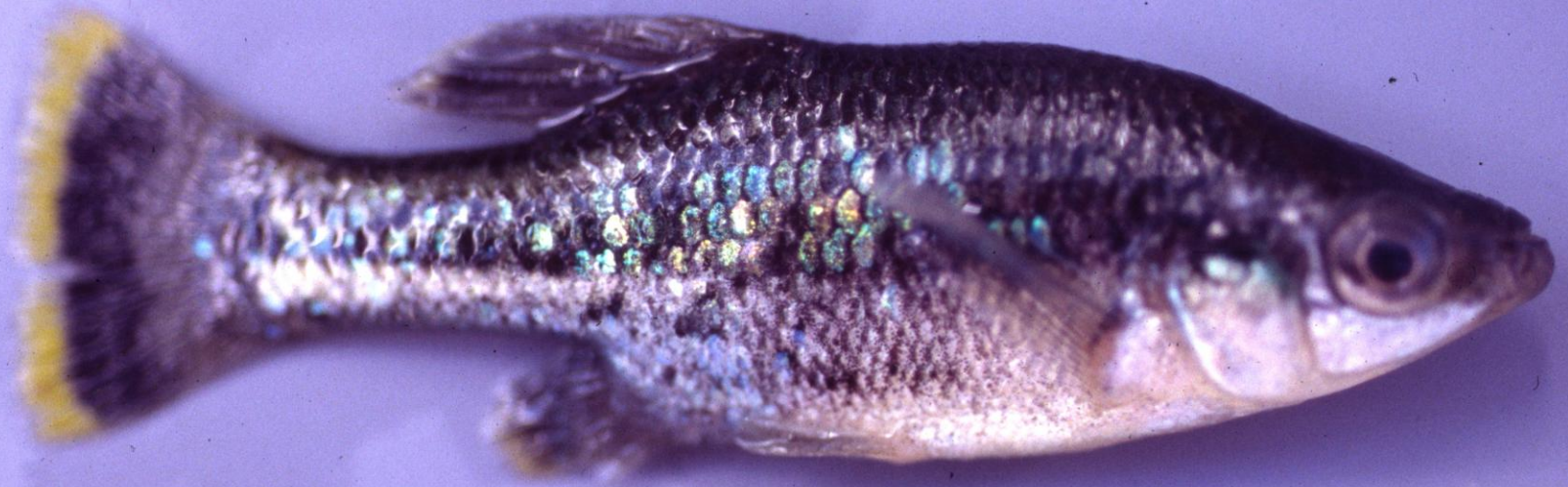
*Skiffia francesae*



# New collection?



*Skiffia cf francesae* 2007



*Ameca splendens*







*Ameca splendens* 'dark'



*Allotoca meeki*



Opopeo



largemouth bass (*Micropterus salmoides*)





Pictures: Juan Carlos Merino, Omar Dominguez-Dominguez, Ruud Wildekamp, John Lyons, the internet & Kees de Jong





*Goodea atripinnis*











*Xenotoca variata*

The image features a background of a repeating ECG (heart rate) pattern in a light gray color. A solid blue vertical bar runs along the right edge of the image. In the center, the word "Pause" is written in a large, bold, black serif font.

**Pause**



*Girardinichthys multiradiatus:*

***EEN INTERESSANTE GOODEÏDE!***



*Xenoophorus captivus*



# MEXICO AS A BIODIVERSE COUNTRY

México: Imagen desde el espacio

Comisión Nacional para el Conocimiento y Uso de la Biodiversidad

Mosaico 2002 de imágenes Modis sin nubes del satélite Terra,

bandas 1,4,3 (RGB), resolución espacial 250 metros.



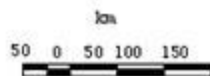
# Bevolkingsdichtheid

70% P  
56% I  
20% W

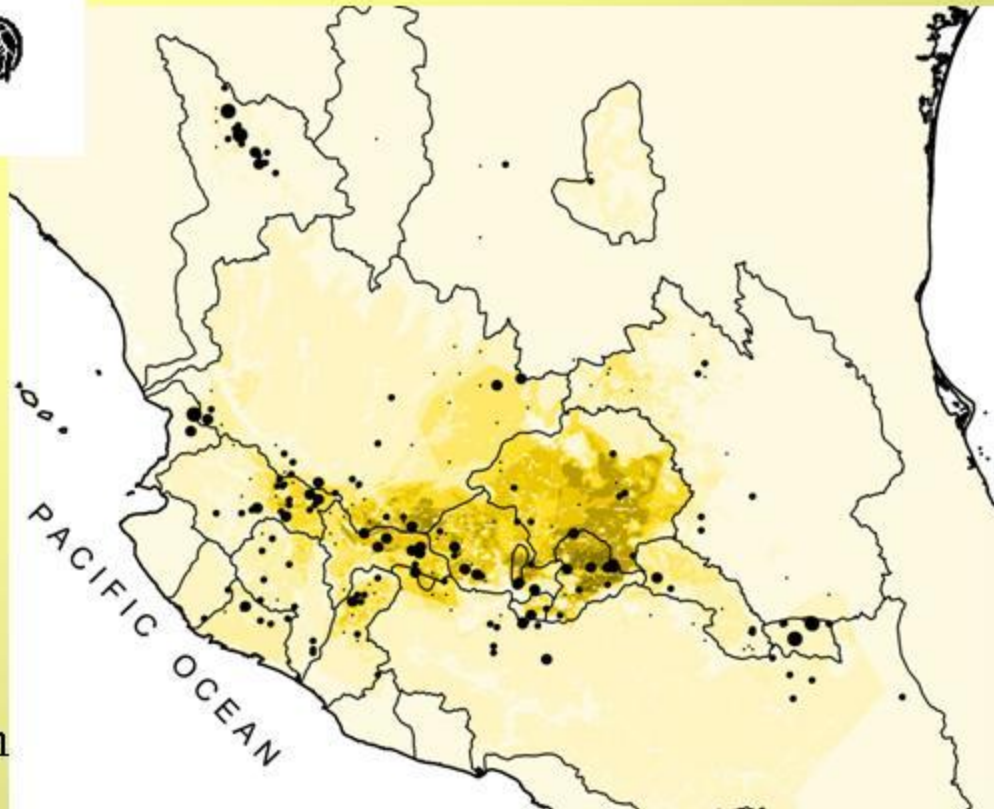
## SIMBOLOGÍA

Hab/km<sup>2</sup> (1995)

- 5 - 20
- 21 - 60
- 61 - 150
- 151 - 300
- 301 - 600
- 601 - 5750



Plaatselijk verdwijnen van soorten







*Lamprei*



*Allotoca dugesii*

Rancho el Molino



*Xenotoca eiseni*



**Río Tamazulae**



*Ilyodon furcidens*



**Río Tamazulae**





*Allodontichthys tamazulae*

Andropodium

Xenotoca

