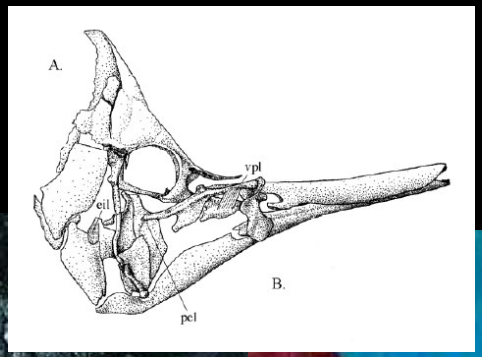
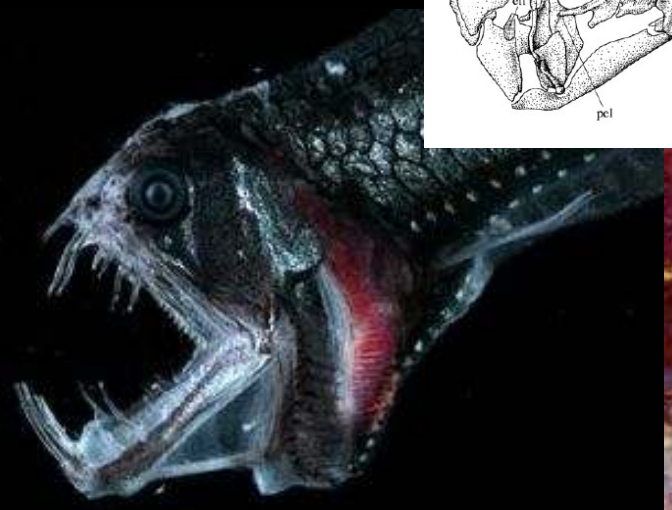
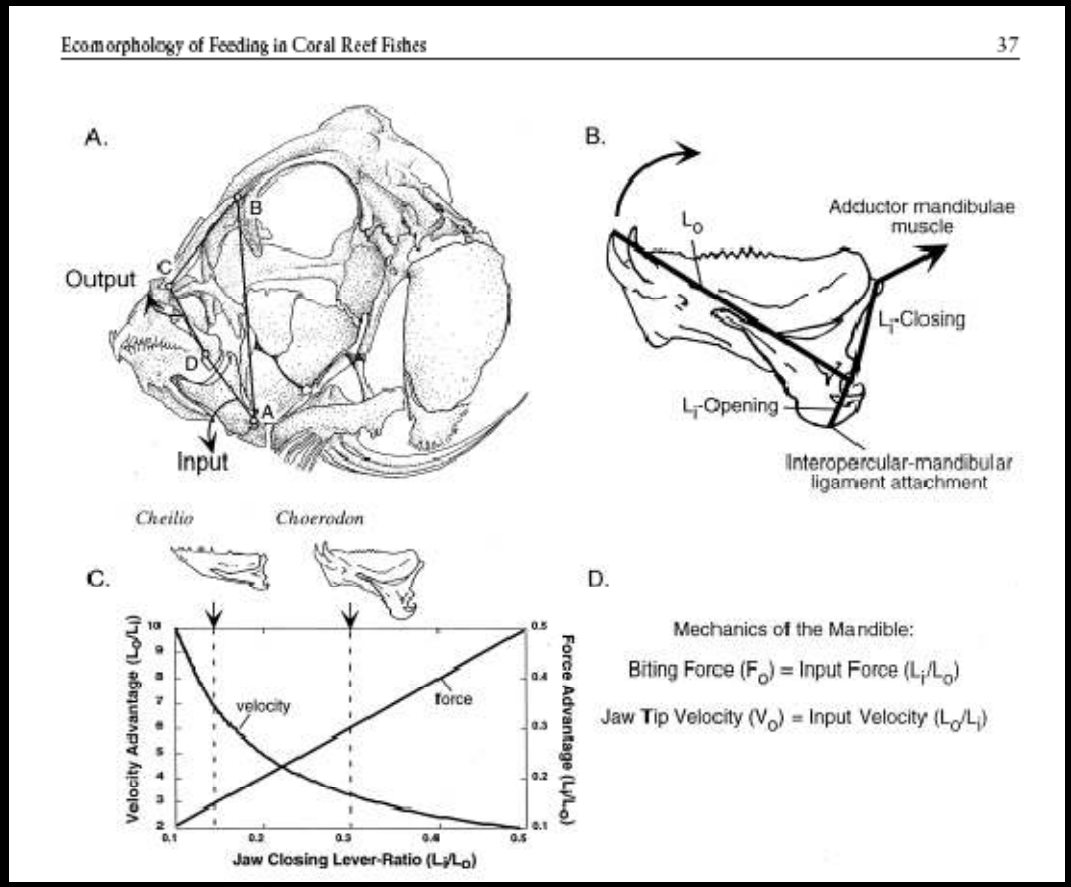
Ecomorfologia alimentar e relações tróficas

Sergio Floeter & Sonia Buck





Mecânica da mandíbula em peixes



Mecânica da mandíbula em peixes

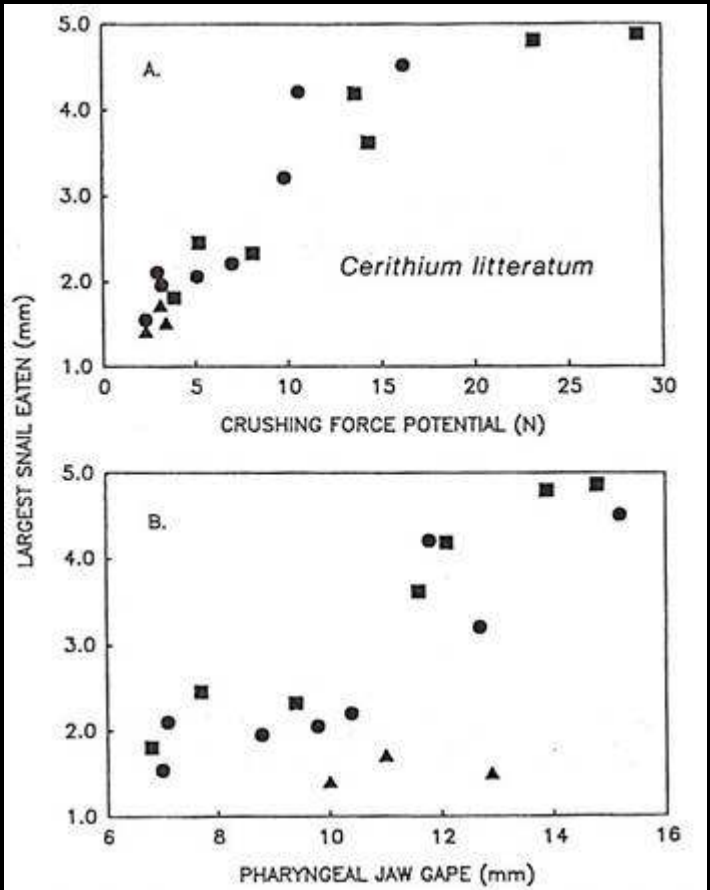


FIG. 3. The maximum size snail (*Cerithium litteratum*) successfully eaten by individuals of three *Halichoeres* species, in laboratory feeding trials, plotted against: (A) predicted pharyngeal jaw crushing force potential (ANCOVA comparison of species slopes: $P = .91$; ANCOVA for species effect: [comparison of intercepts]: $P = .21$) and (B) pharyngeal jaw gape of fishes (ANCOVA comparison of species slopes: $P = .78$; ANCOVA for species effect [comparison of intercepts]: $P < .001$). However, note small sample size for *H. maculipinna*. ■ = *H. garnoti*, ● = *H. bivittatus*, and ▲ = *H. maculipinna*.

Mecânica da mandíbula em peixes

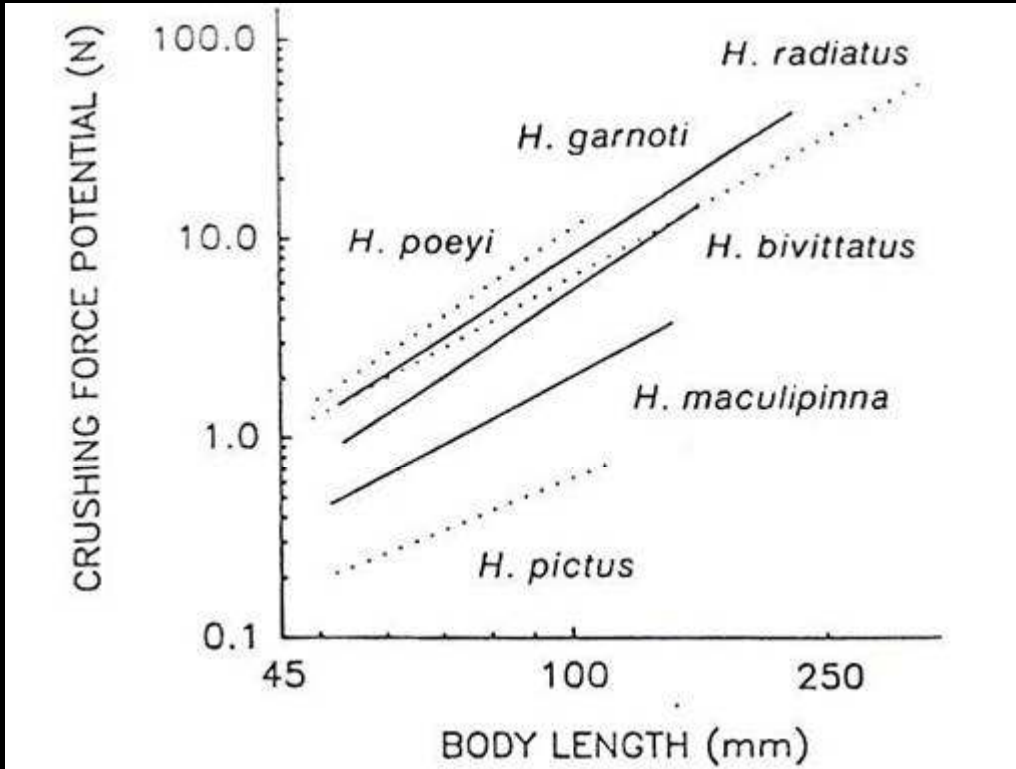
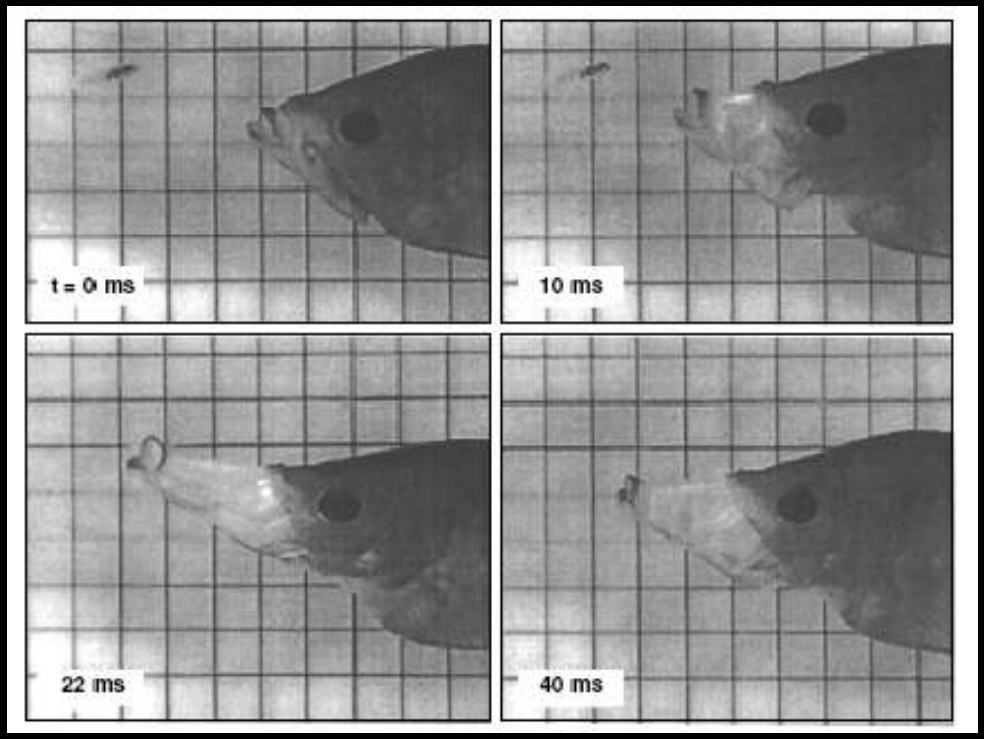
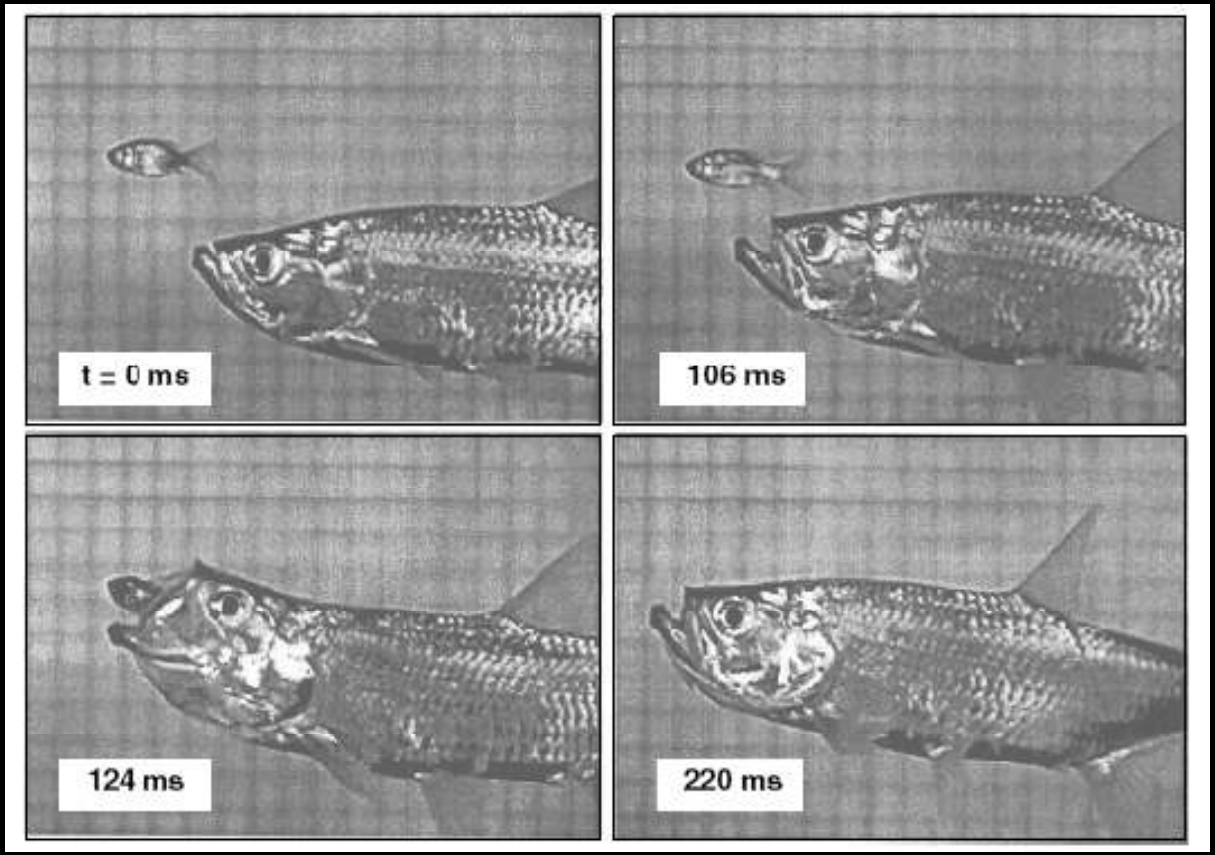


FIG. 2. Log_{10}-log_{10} plots of estimated pharyngeal jaw crushing force potential and fish standard length, showing the scaling relationships between these variables in six *Halichoeres* species. The size ranges indicated are bounded by the smallest and largest fish examined from each species. Further studies were performed with the three species indicated with solid lines: *H. garnoti*, *H. bivittatus*, and *H. maculipinna*. See Appendix 1 for scaling equation parameters.

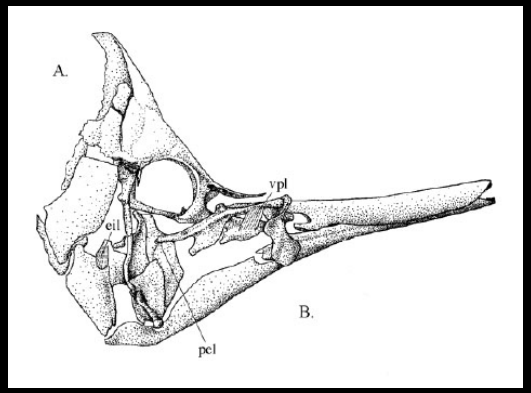
Captura da presa: mecânica mandíbular altamente modificada em *Epibulus insidiator*



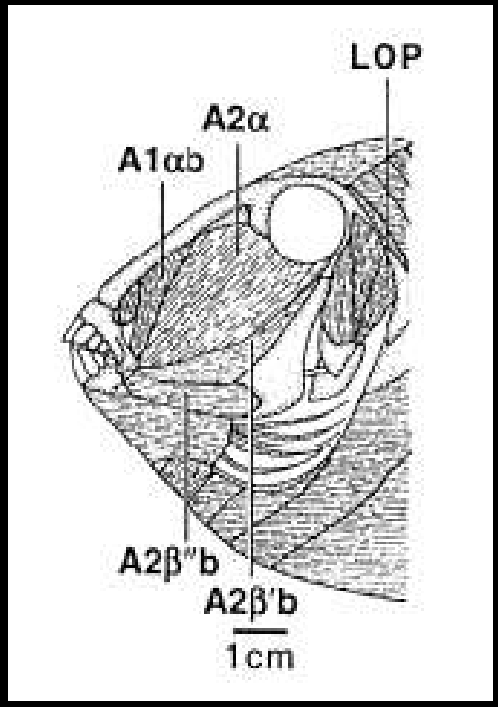
Captura da presa: Tarpão *Megalops atlanticus*

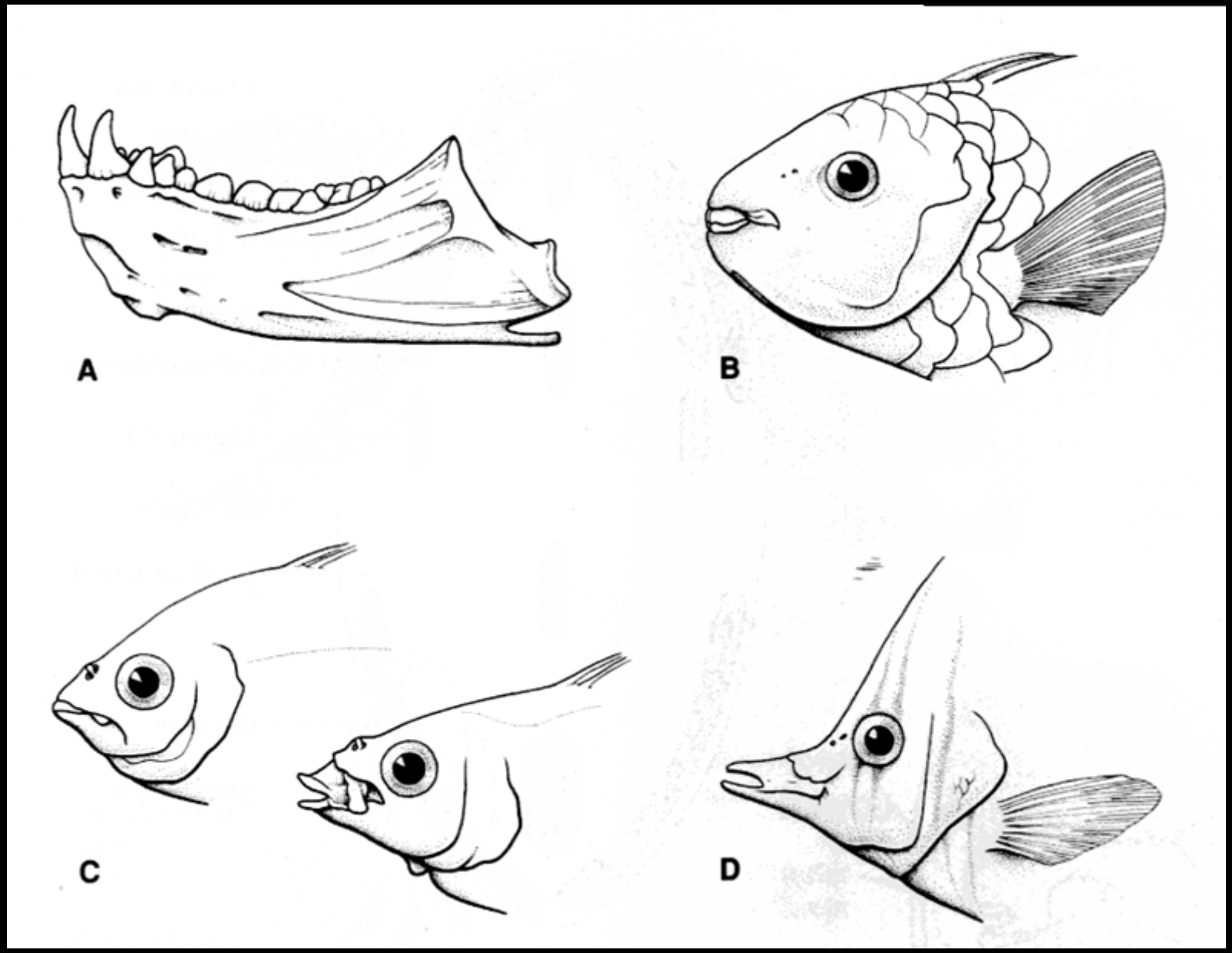


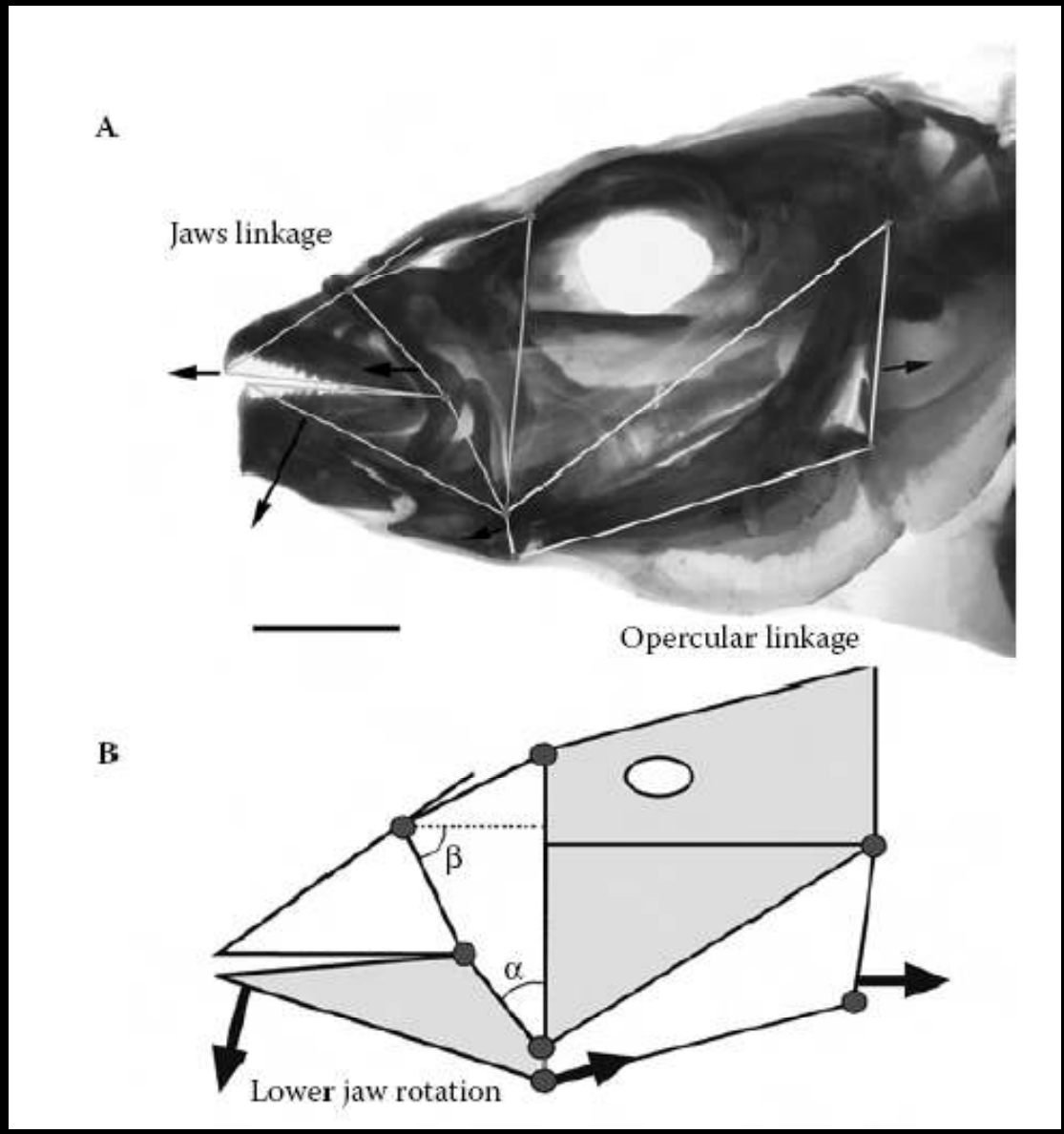
Modificações das mandíbulas - promovendo mecanismos alimentares mais eficiente

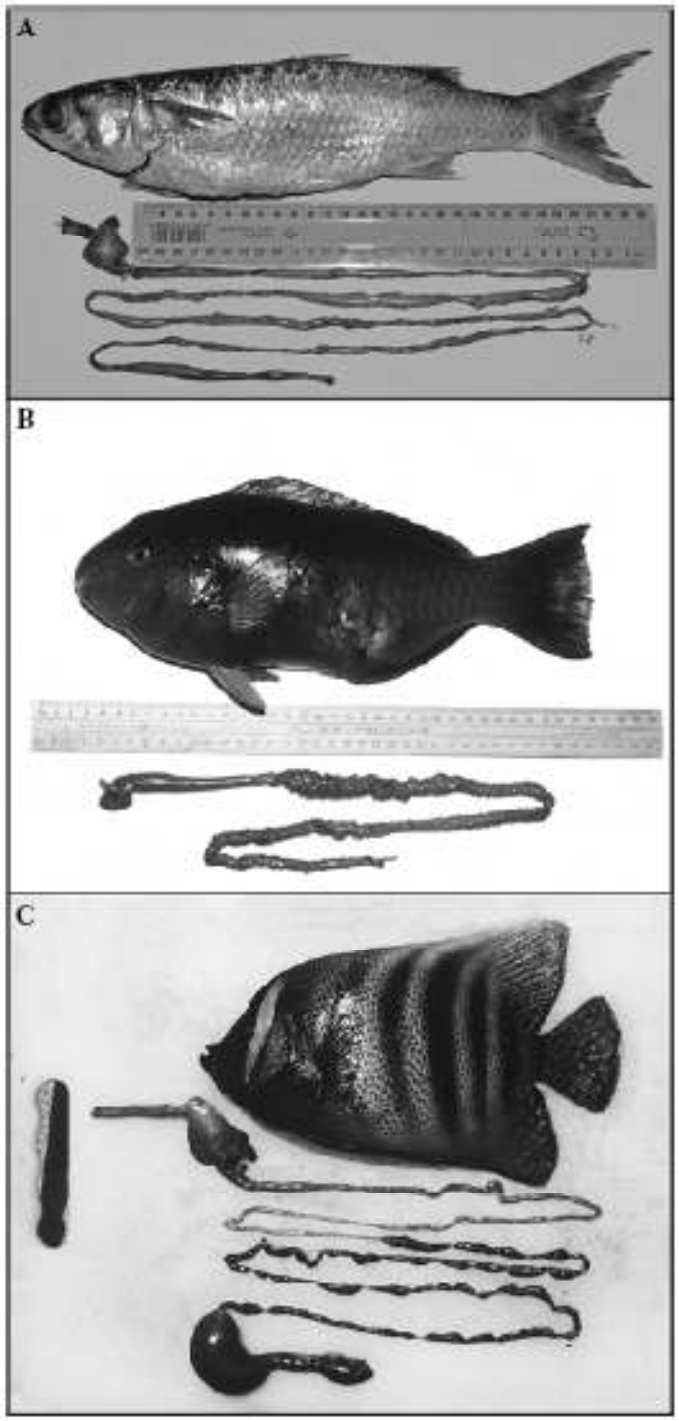


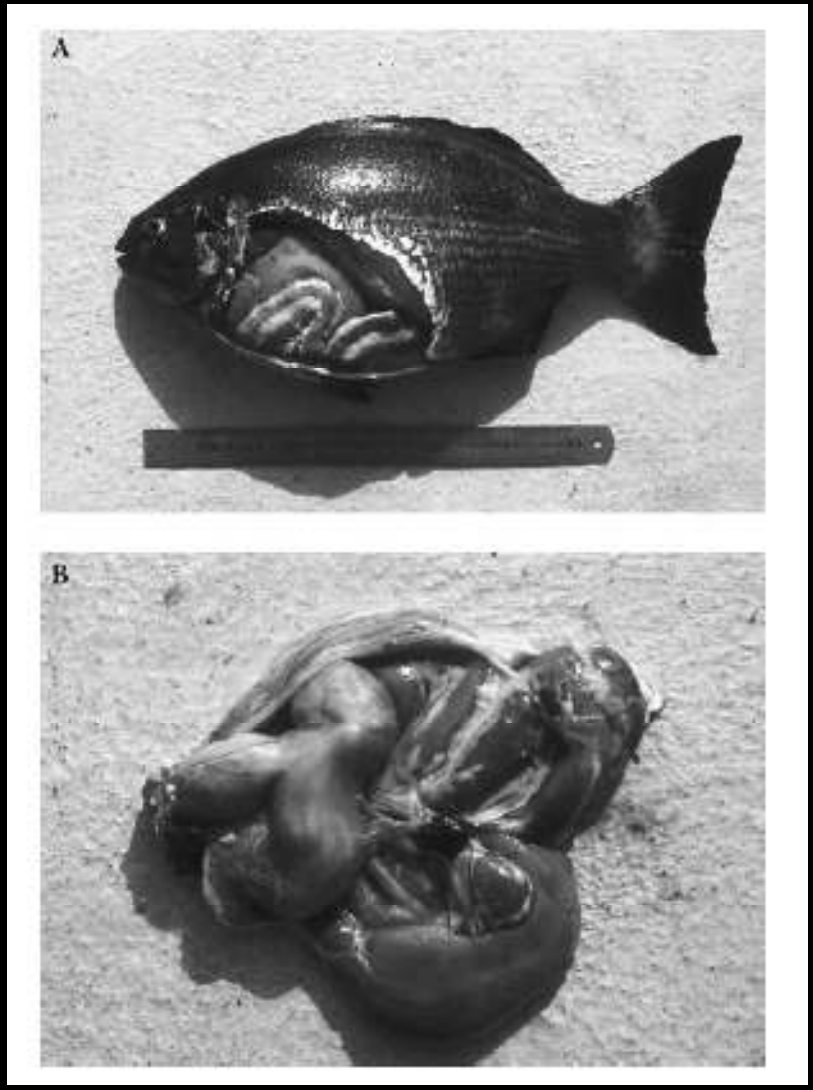
Musculatura relacionada a alimentação: ex. do Peroá *Balistes capriscus*



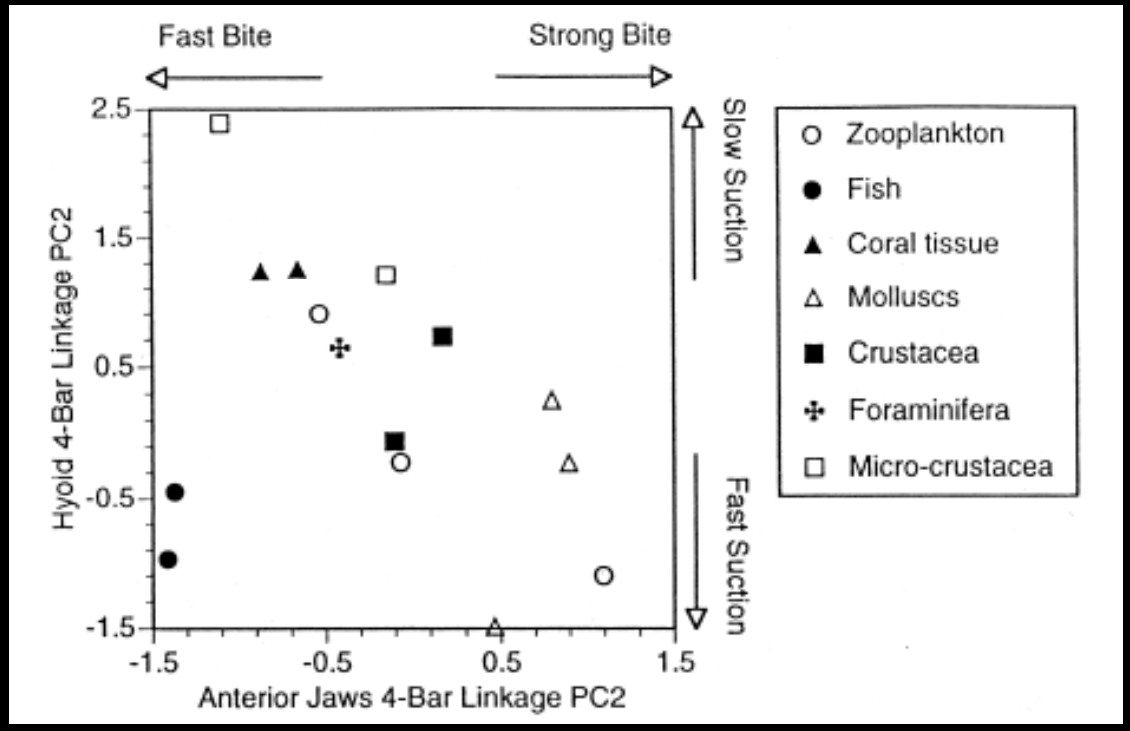

A
B
C
D


A
Jaws linkage
Opercular linkage
B
β
α
Lower jaw rotation

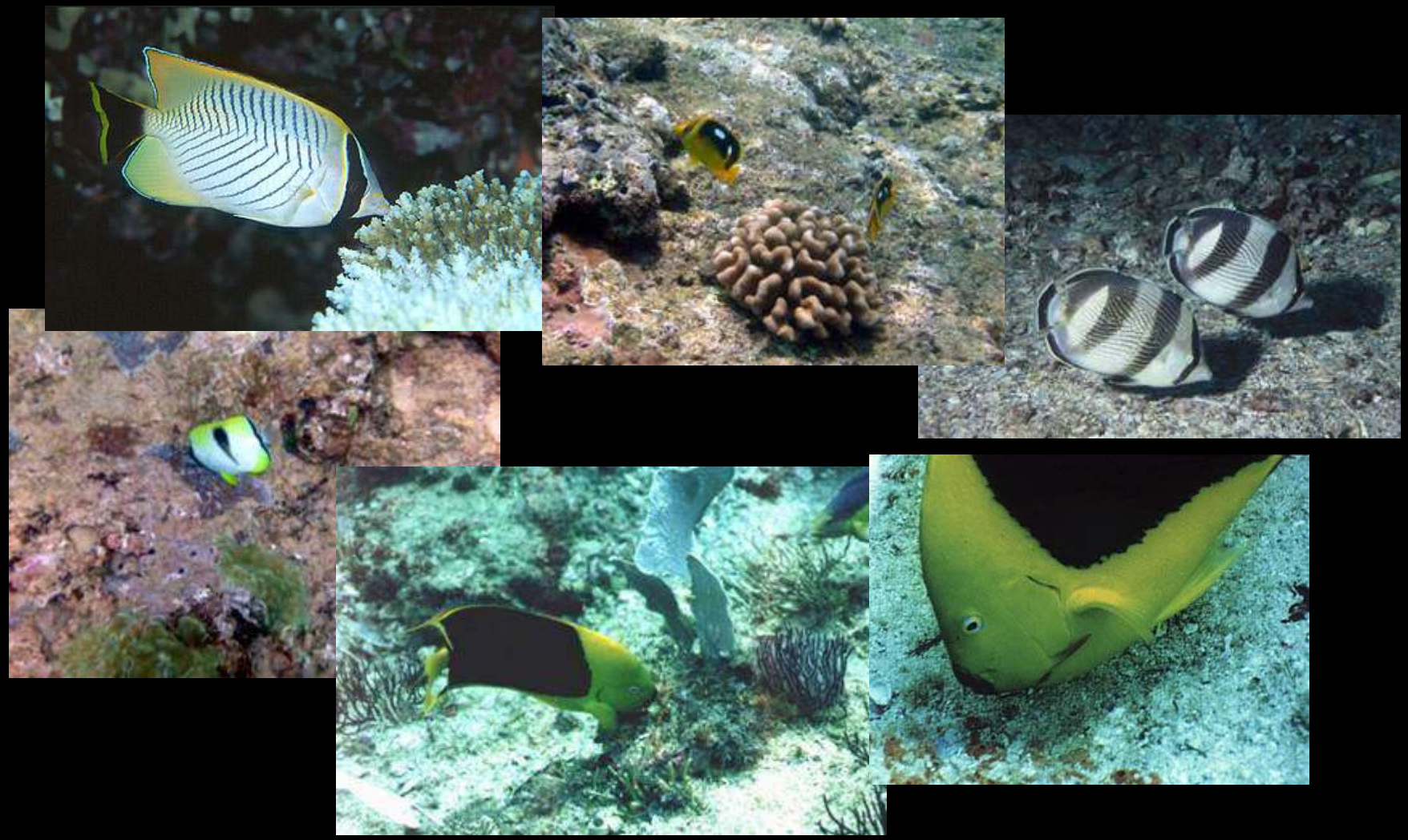

A
B
C


A
B

Mecânica alimentar de 16 Labrídeos recifais na Austrália: Análise de Componentes Principais



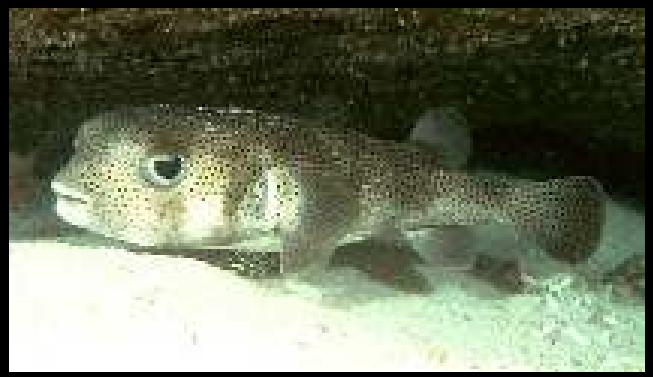
Presas pequenas e presas ao substrato

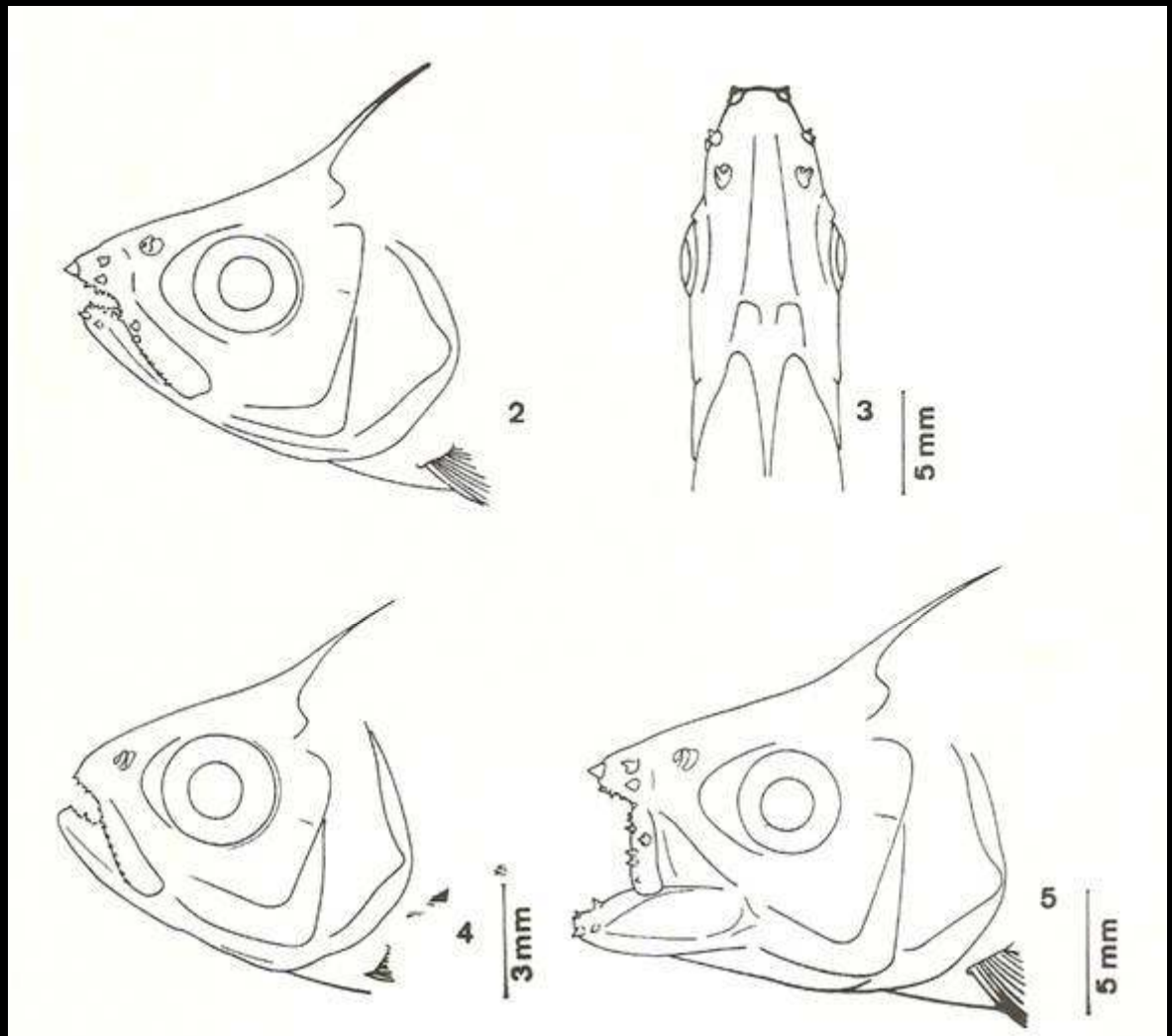


Presas com concha dura

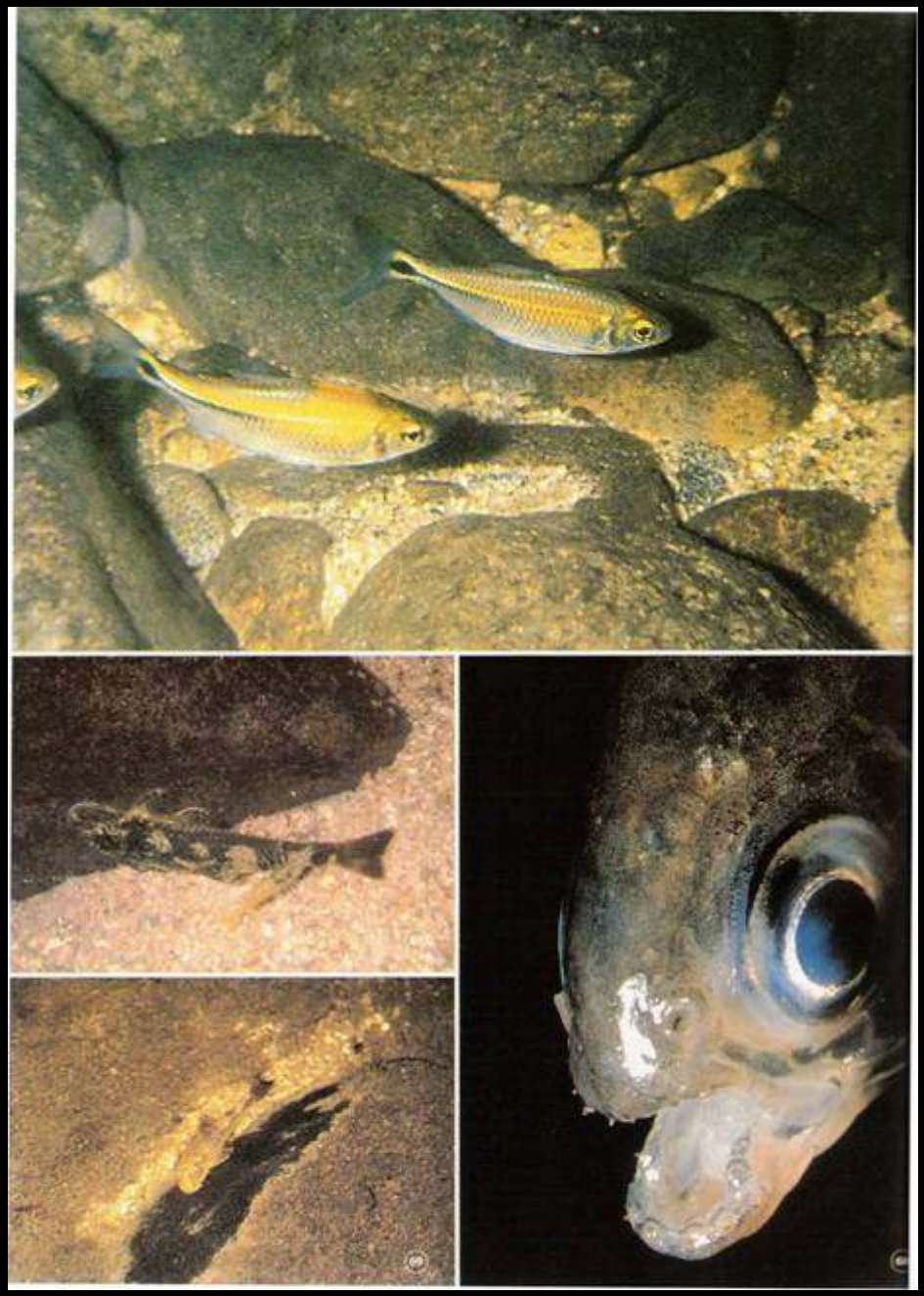
<u>Mandíbula faringeal:</u> Labridae, Carangidae, Haemulidae, Sciaenidae

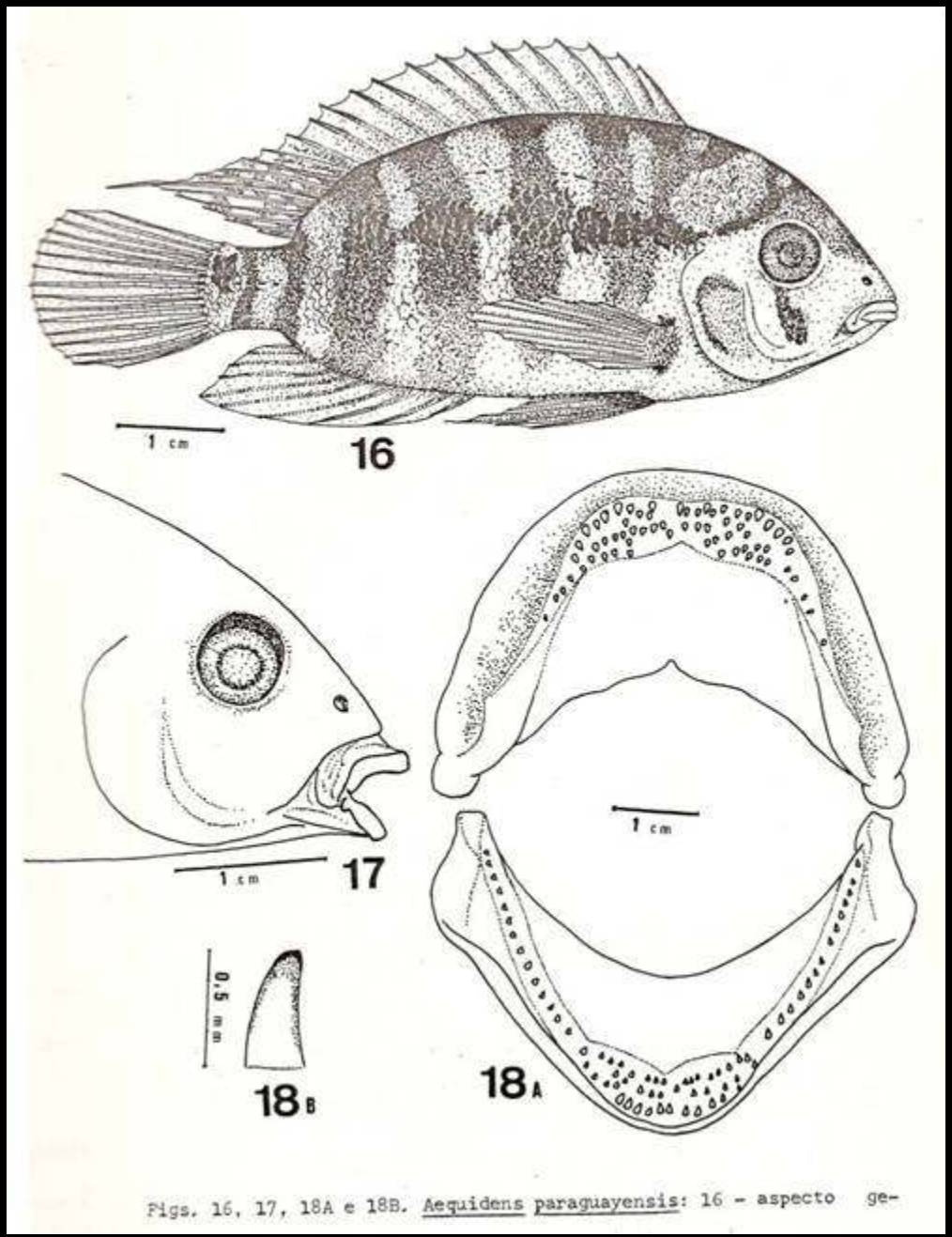
<u>Mandíbula oral:</u> Diodontidae, Tetraodontidae, Balistidae, Sparidae





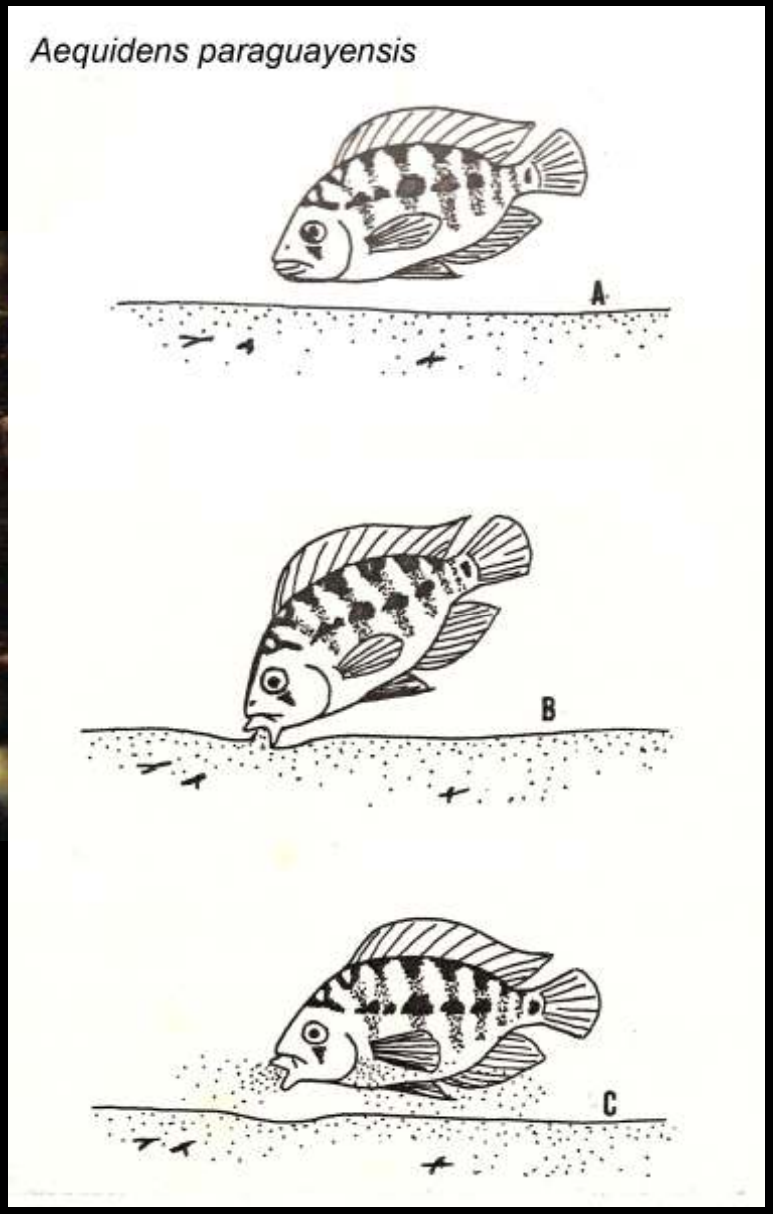
Figuras 2 a 5 - Aspectos lateral e dorsal da cabeça de *Roeboides prognathus*. Fig. 2: indivíduo com 76 mm , mostrando a proporção entre as maxilas e a posição dos dentes exteriorizados (MZUSP 14738)





Figs. 16, 17, 18A e 18B. Aequidens paraguayensis: 16 - aspecto ge-

Atividade alimentar



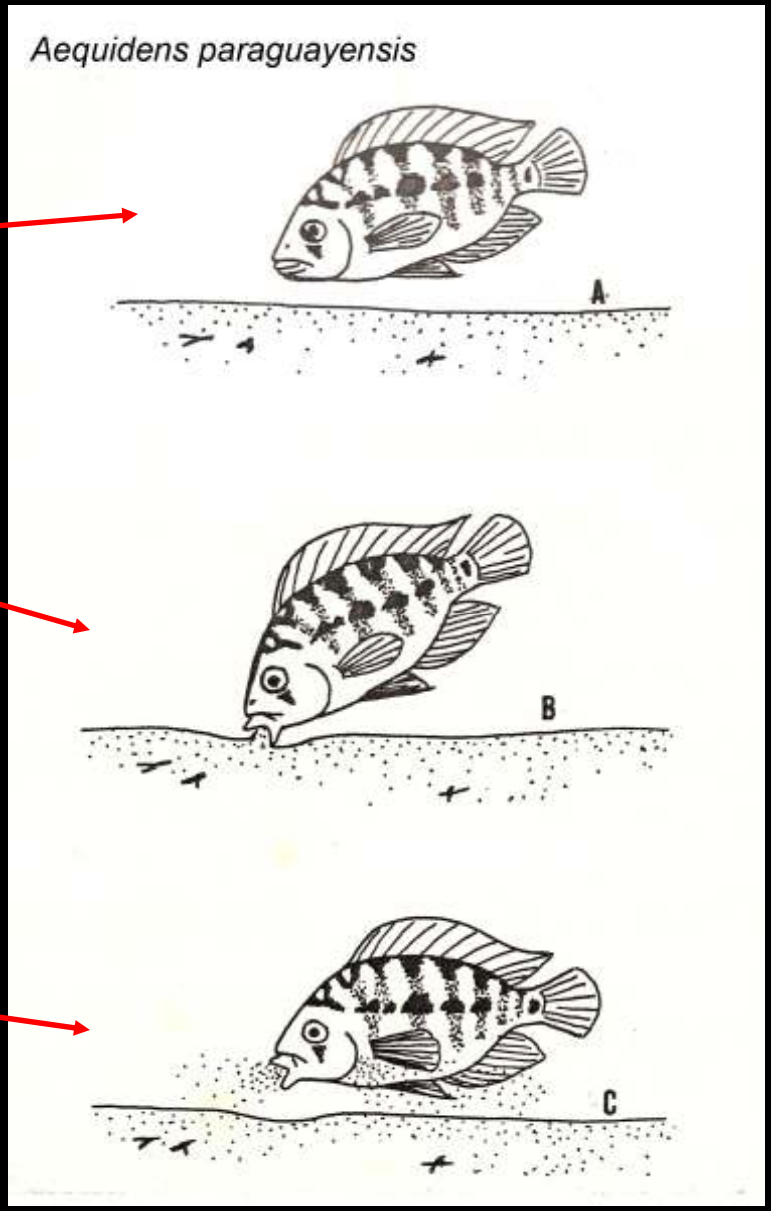
Machado e Sazima (1983)

Como descrever comportamento?

Inspecionando o substrato

Abocanhando parte do substrato ao fuçar

Selecionando o alimento, com expulsão de areia pelas aberturas branquiais e bucal



Modelos de Radiação Trófica

1. Mecânica alimentar determina padrões de uso de presas
2. Radiação ecomorfológica
3. Grupos funcionais

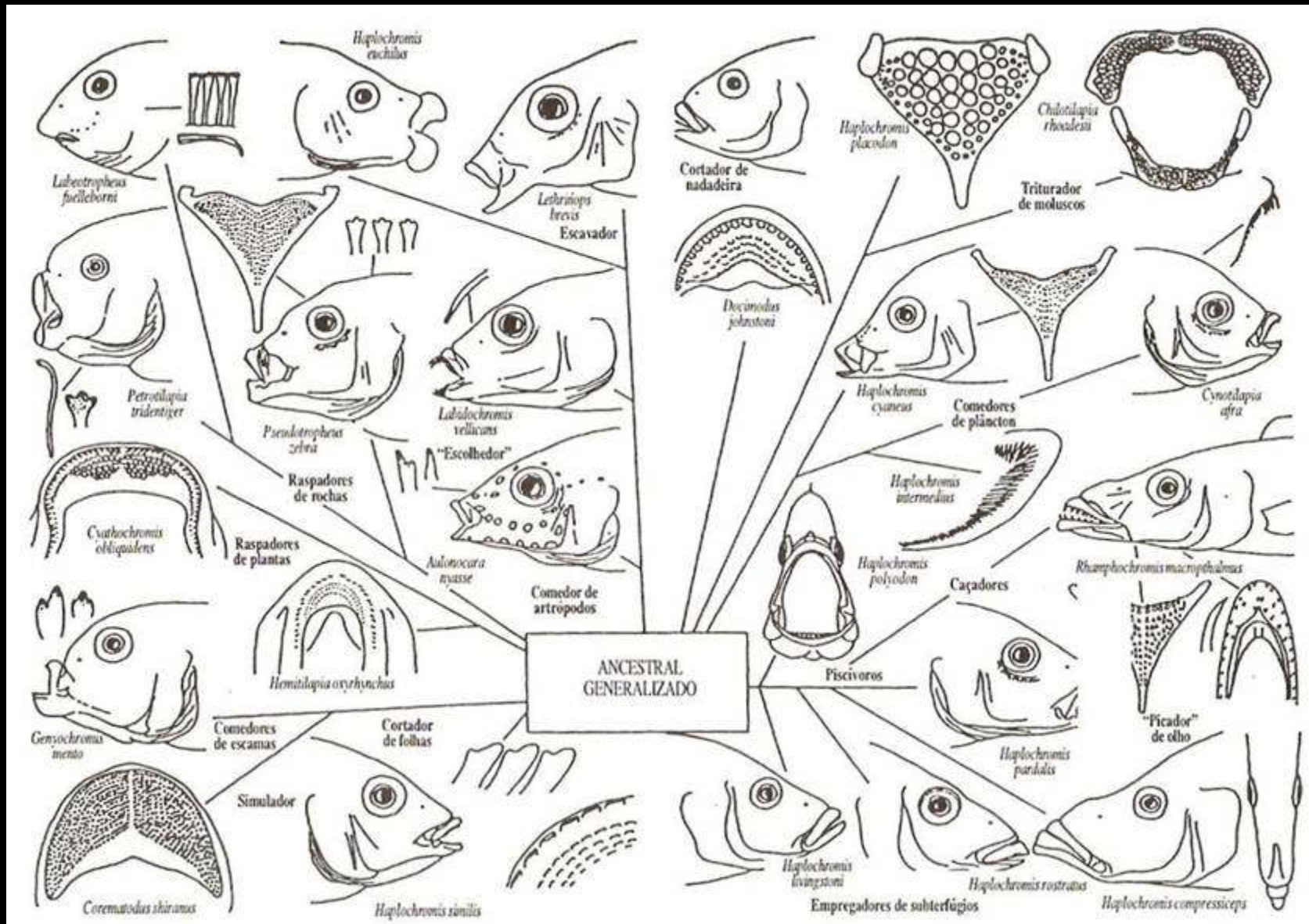


Fig. 4.1. Exemplos de irradiação adaptativa nos ciclídeos do lago Malauí (segundo Fryer & Iles, 1972).

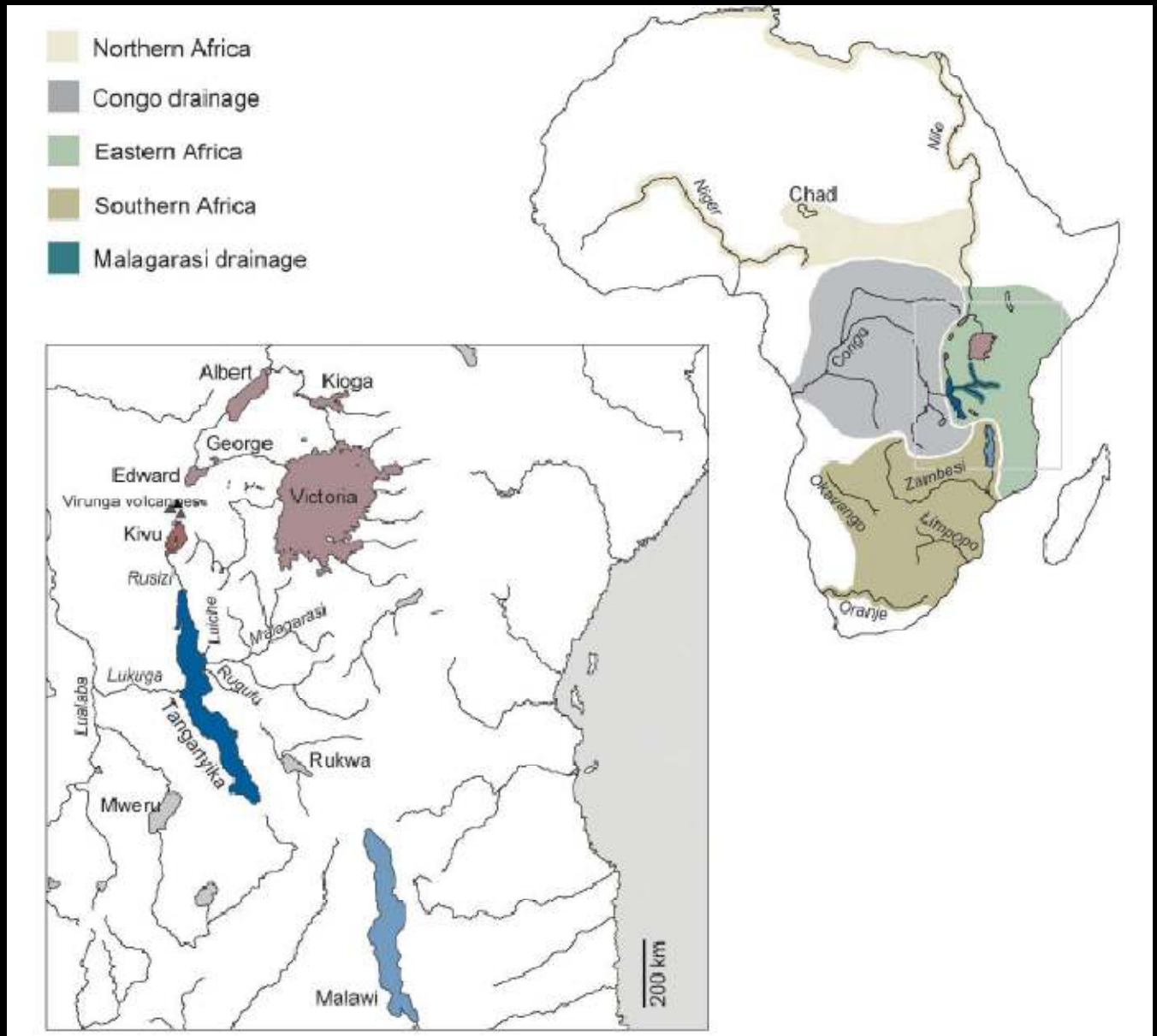
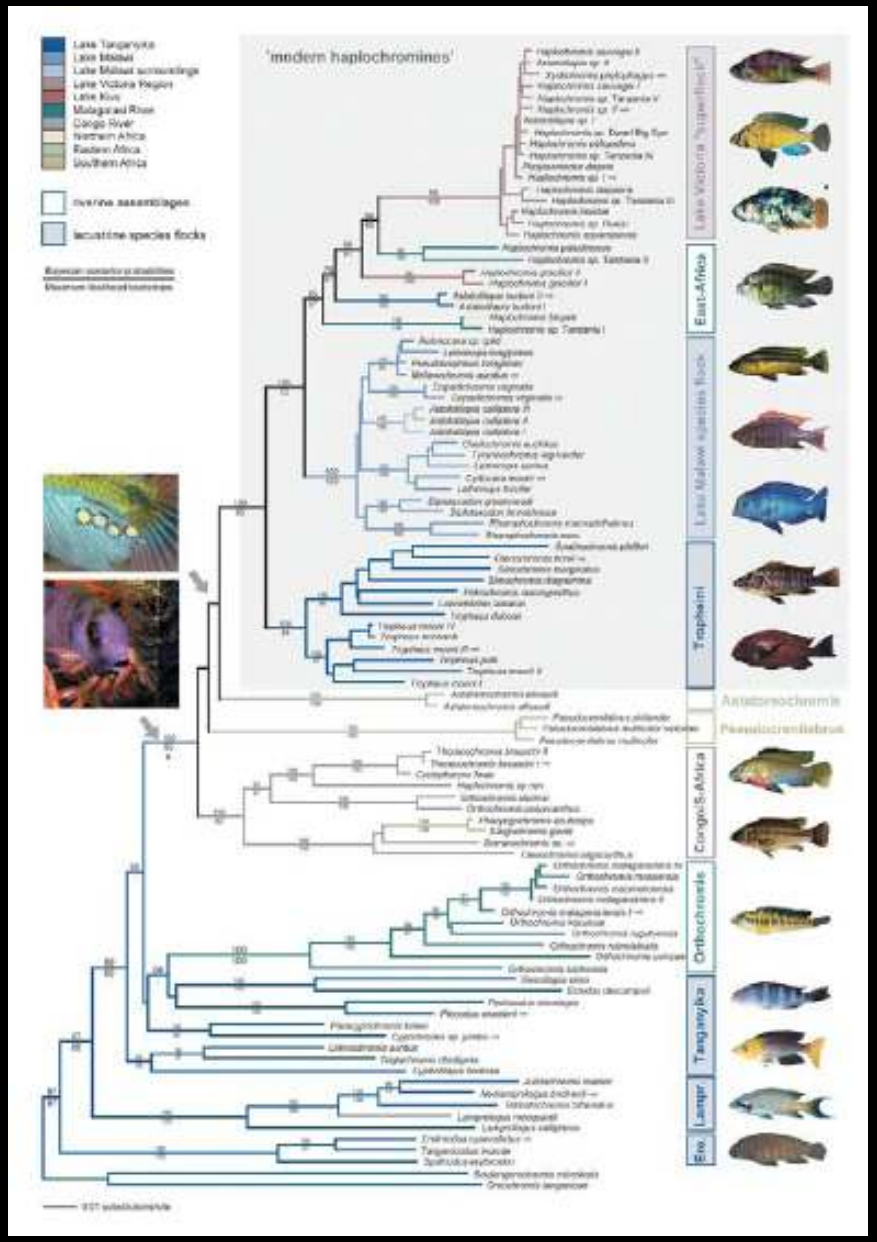
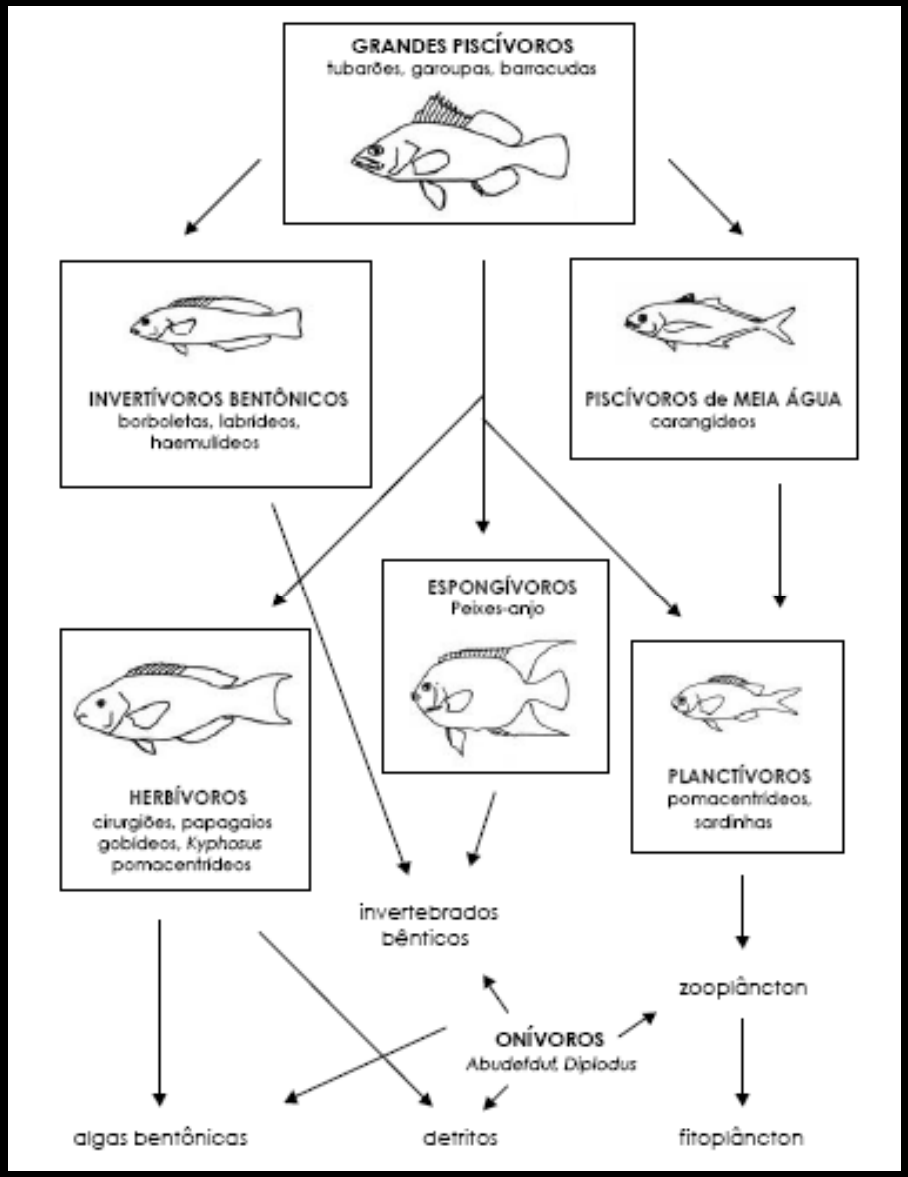


Figure 1
Distribution of the major haplochromine lineages in Africa with special emphasis on the East African lakes


Lake Tanganyika
Lake Malawi
Lake Malawi surroundings
Lake Victoria Region
Lake Kivu
Malagarasi River
Congo River
Northern Africa
Eastern Africa
Southern Africa
riverine assemblages
lacustrine species flocks
'modern haplochromines'
Lake Victoria "superflock"
East-Africa
Lake Malawi species flock
Tropheini
Astatotilapiini
Pseudocrenilabrini
Congo/S-Africa
Orthochromis
Tanganyika
Lamp.
Env.



Relações tróficas

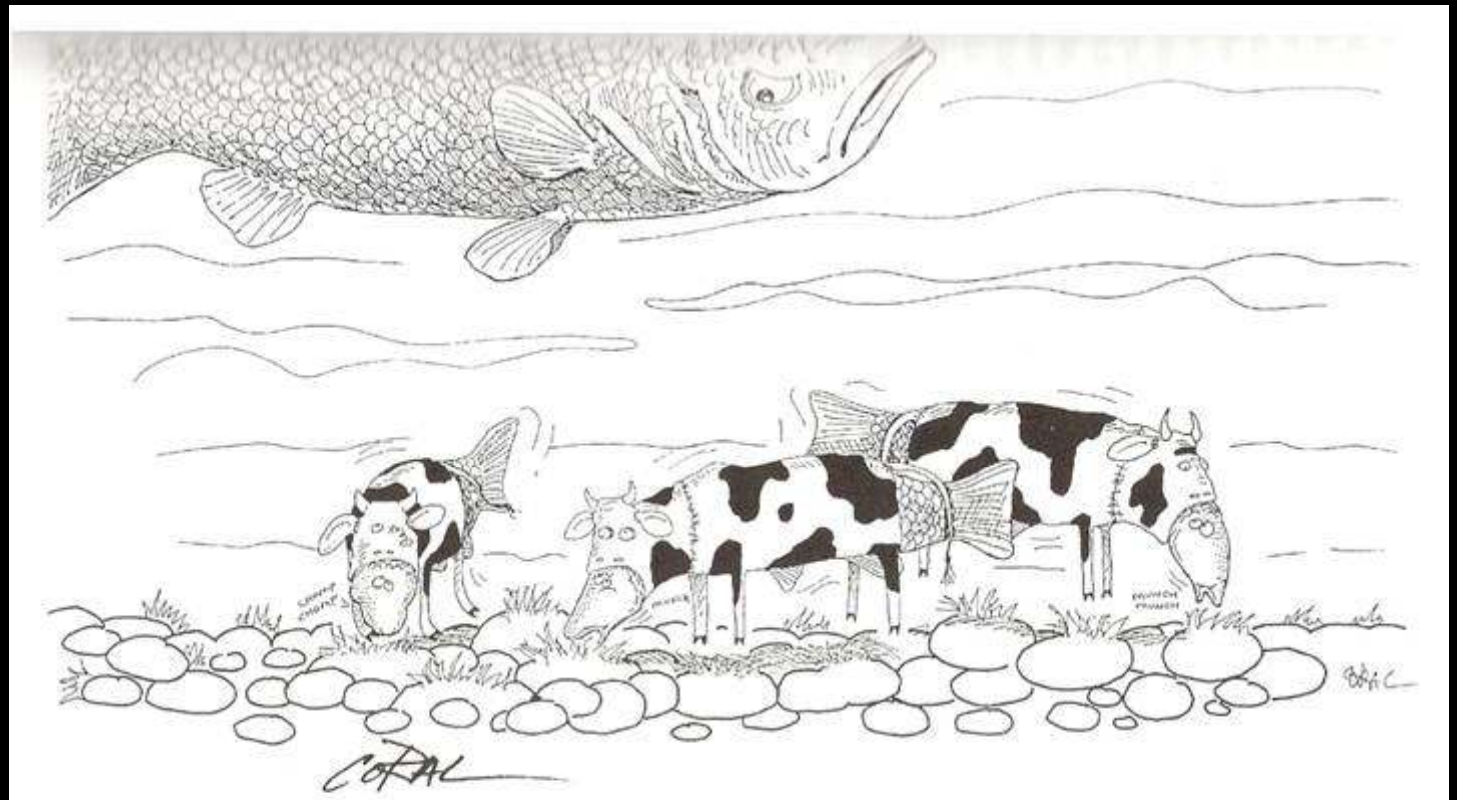


Figure 1.8. Depiction of the potential for piscivorous bass to influence the behavior of the herbivorous minnow *Campostoma anomalum*, producing the cascading trophic effect on attached algae described in Power and Matthews (1983). (Artwork courtesy of Coral McCallister.)

Qualidade do alimento e estratégias alimentares

***- Alta qualidade* – CARNÍVOROS, PISCÍVOROS, INVERTÍVOROS (INVERT. MÓVEIS) e PLANCTÍVOROS.**
Alto conteúdo energético e proteico. Alta digestibilidade.

***- Baixa qualidade* – HERBÍVOROS, DETRITÍVOROS e INVERTÍVOROS (INVERT. SÉSSEIS).**
Baixo conteúdo de energia, geralmente com baixa taxa de assimilação e apresentando defesas químicas ou estruturais.

- Qualidade intermediária – **ONÍVOROS.**
Alga + proteína animal.

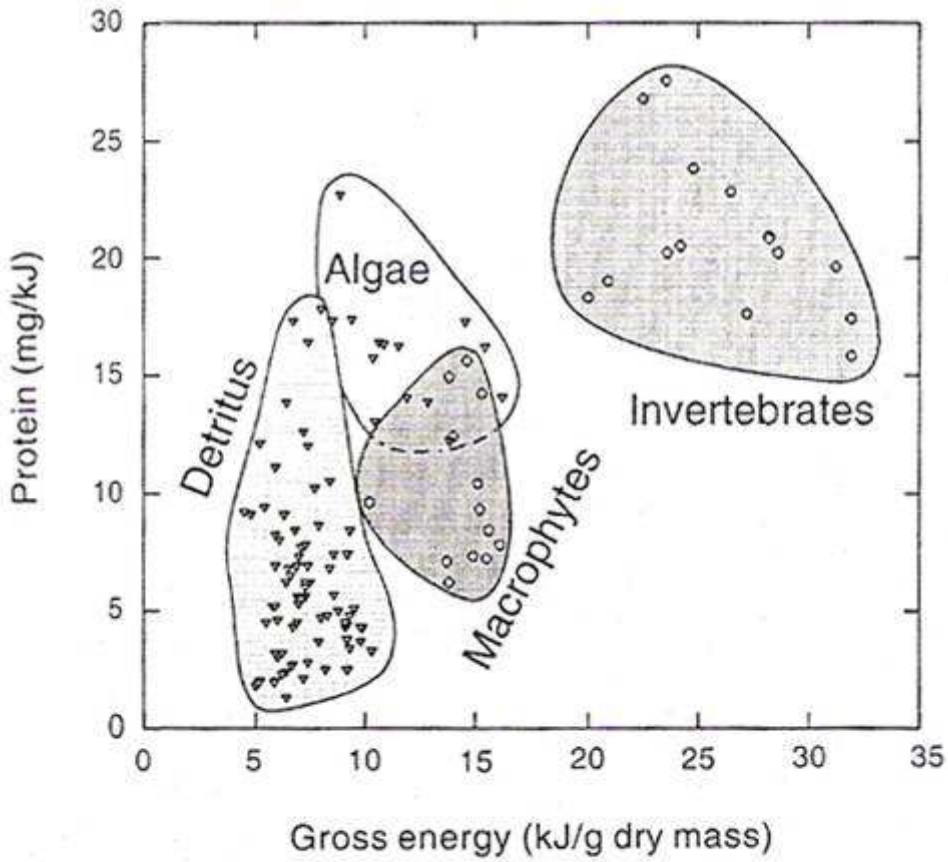


FIG. 1. Protein and gross energy in food resources available to consumers in aquatic habitats.

Peixes que consomem alimentos de relativo baixo valor nutricional, seriam mais importantes nos trópicos:

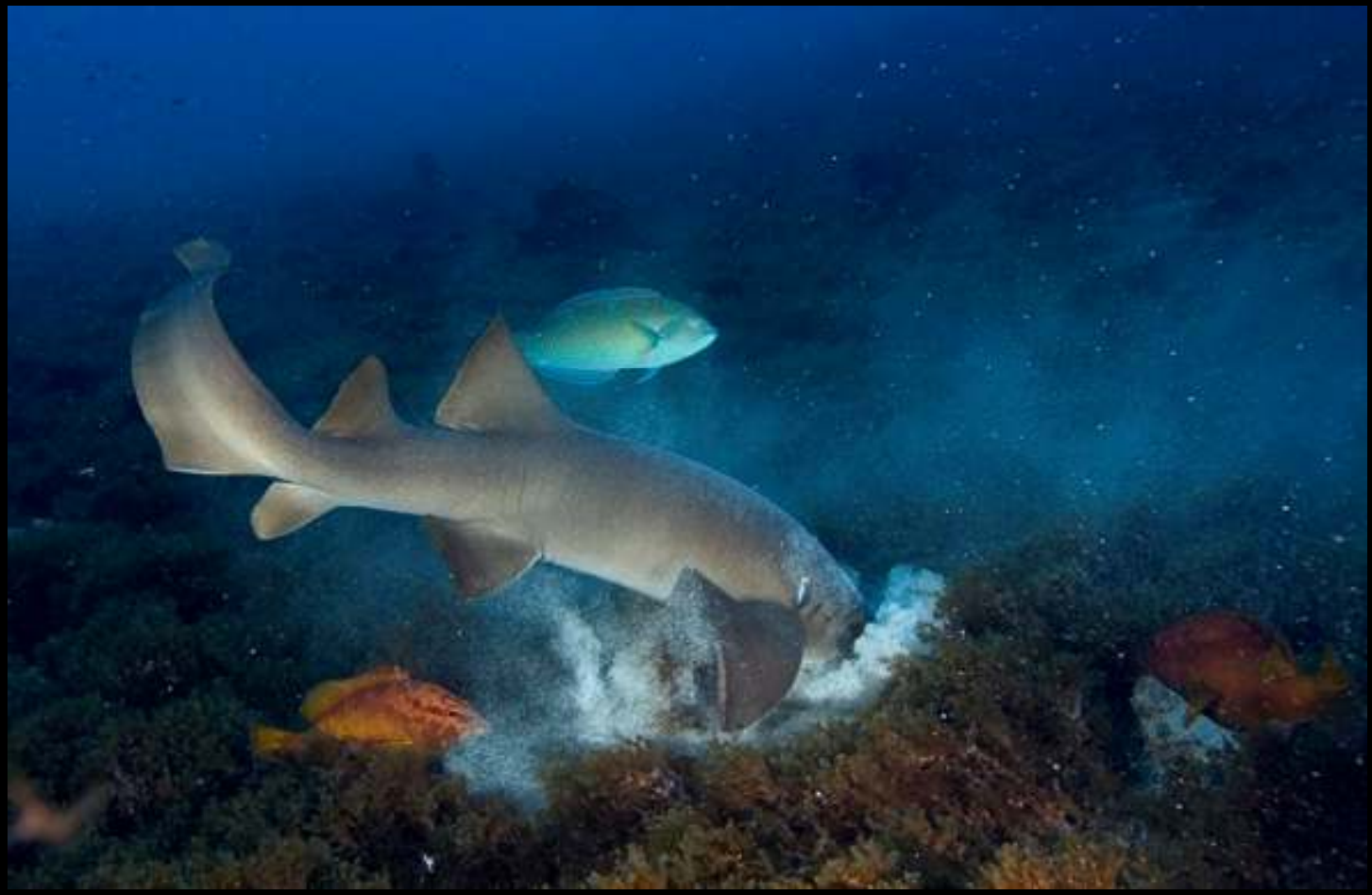
Herbívoros

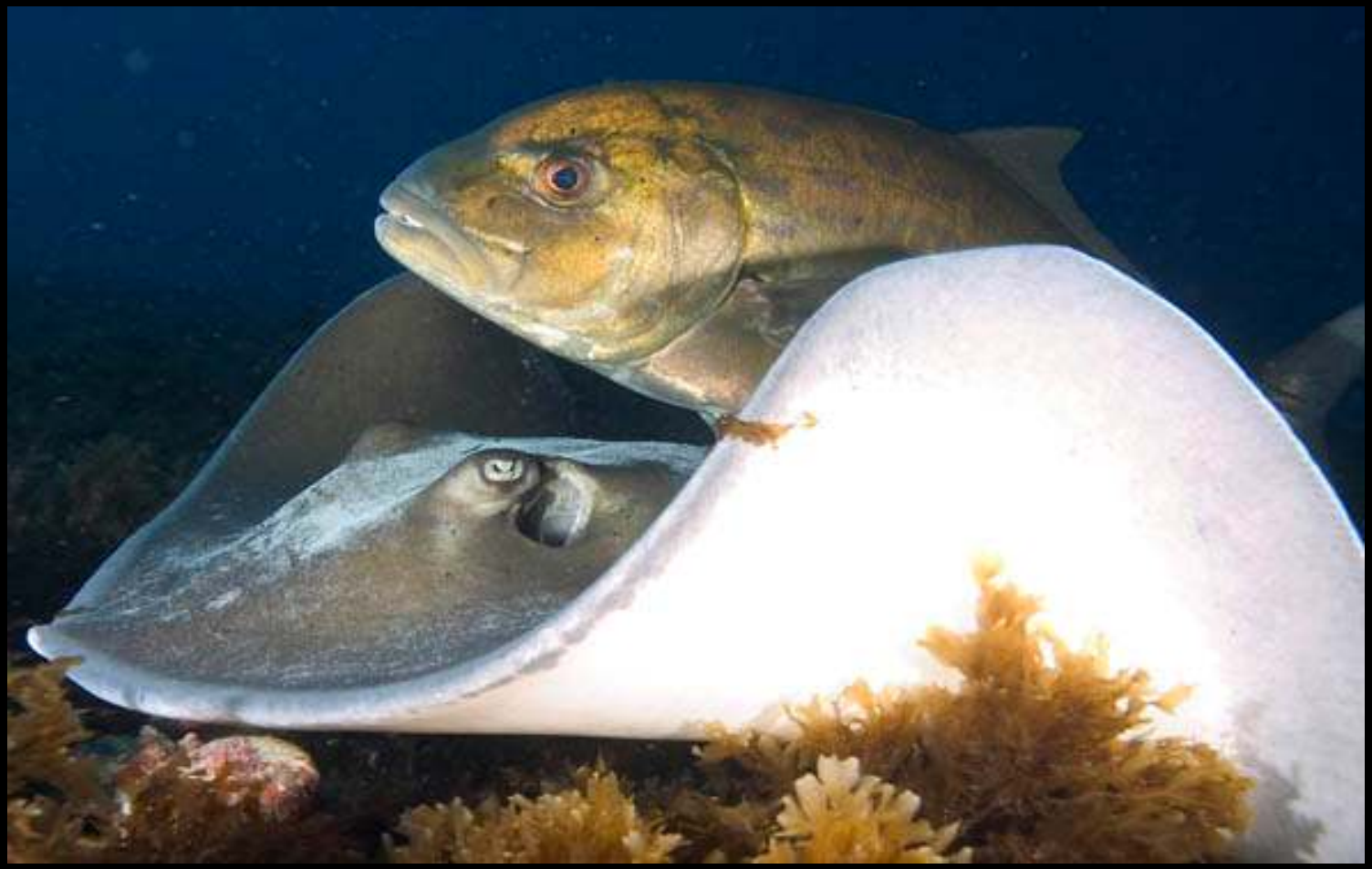
Espongívoros

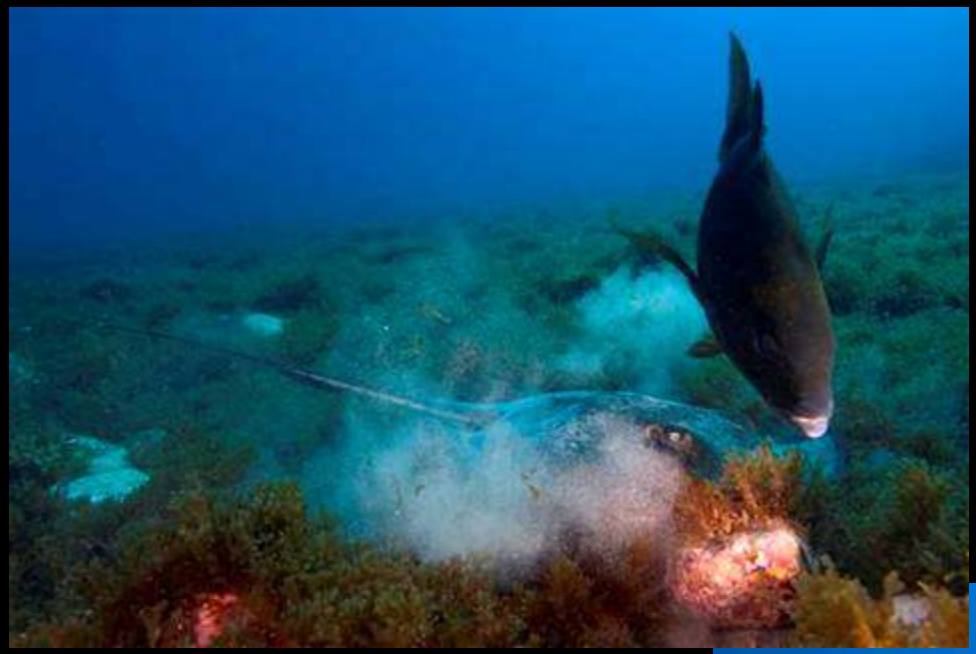
Coralívoros

Estratégias de Forrageamento

Estratégias de Forrageamento







Estratégias de Forrageamento:
Água doce vs. Ambiente marinho

Estratégias de Forrageamento:
Água doce vs. Ambiente marinho

J. Fish Biol. (1986) **29,** 53–65

Similarities in feeding behaviour between some marine and freshwater fishes in two tropical communities

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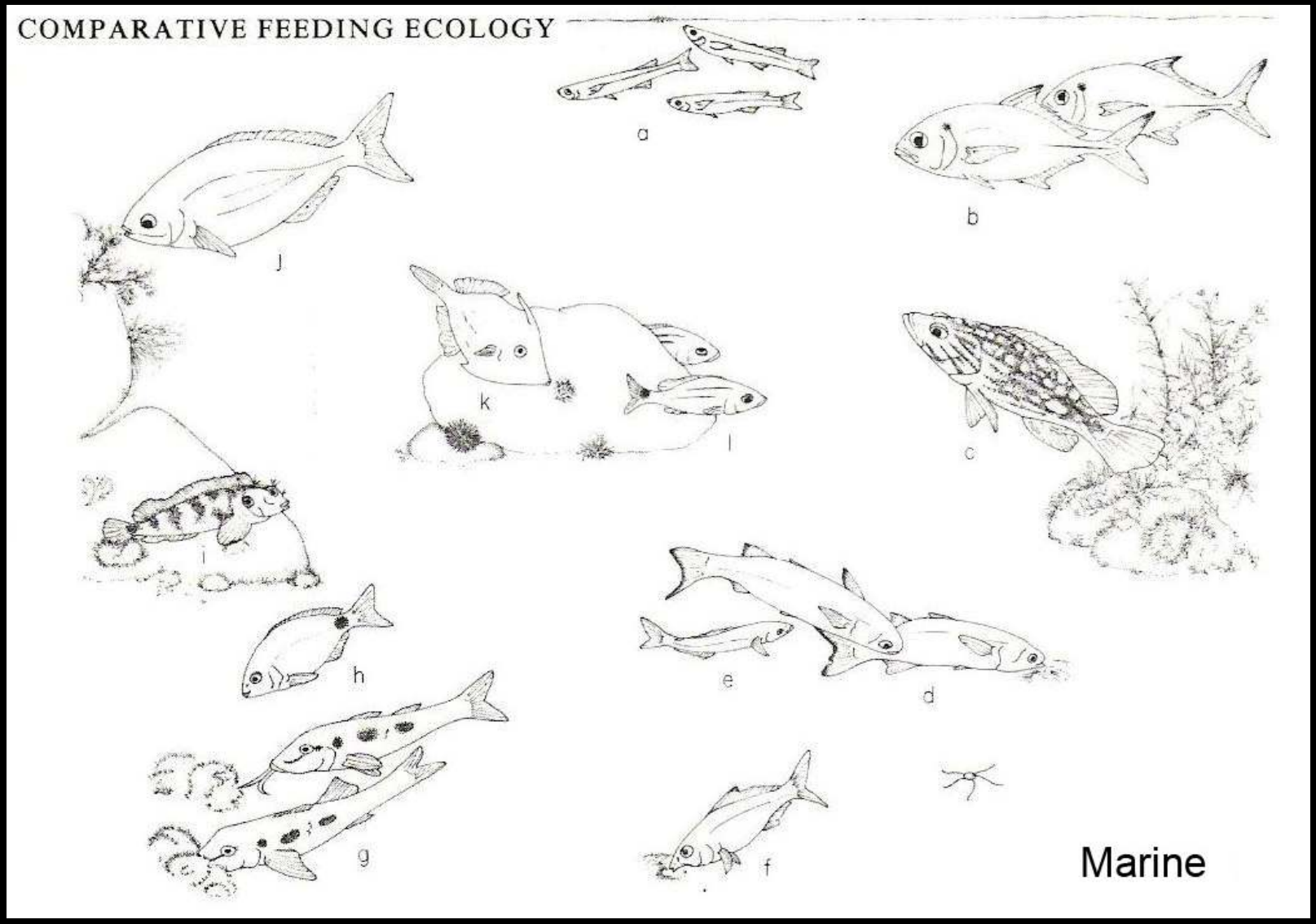
(*Received 22 October 1985, Accepted 31 December 1985*)

The feeding behaviour and diets of fishes in two tropical habitats, a marine reef and a freshwater pond, were studied comparatively in Brazil. Similarities were found in the tactics employed to obtain food, the social patterns during foraging, and the general diet, notwithstanding lower-level taxonomic differences between the food items. The feeding behaviours of about one-third of the fish fauna from each community were approximately equivalent. The feeding categories of these fishes are briefly described. The similarities in the feeding modes probably reflect structural and functional properties shared by the two communities. Additional behavioural similarities of fishes in both habitats are presented and the lack of some particular foraging modes in each community is noted. The picture emerged that different, unrelated fish assemblages have the ability to evolve towards a similar behavioural and structural organization in response to comparable situations and constraints. The value of underwater observations and naturalistic studies on tropical freshwater fish assemblages is indicated.


COMPARATIVE FEEDING ECOLOGY
a
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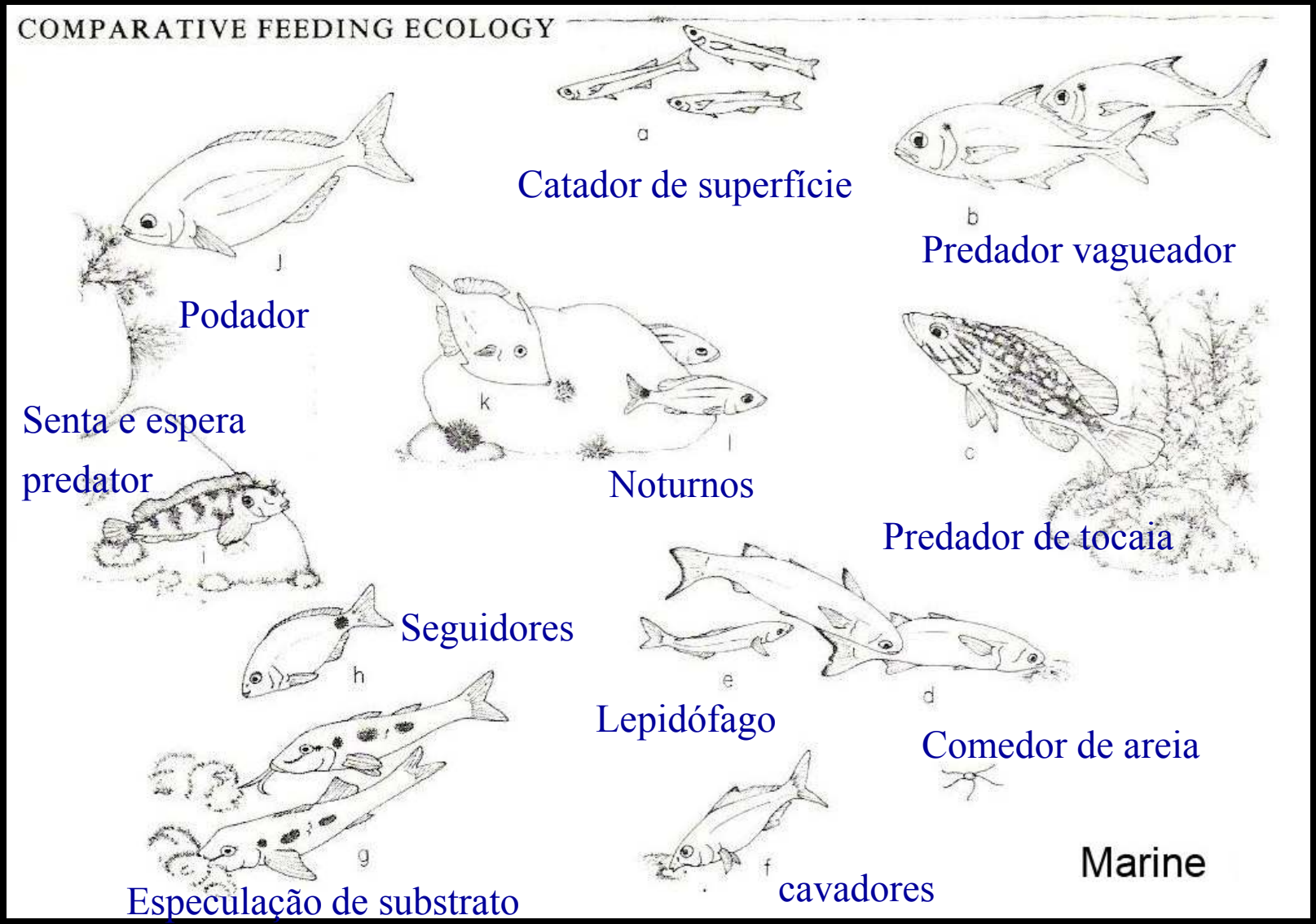
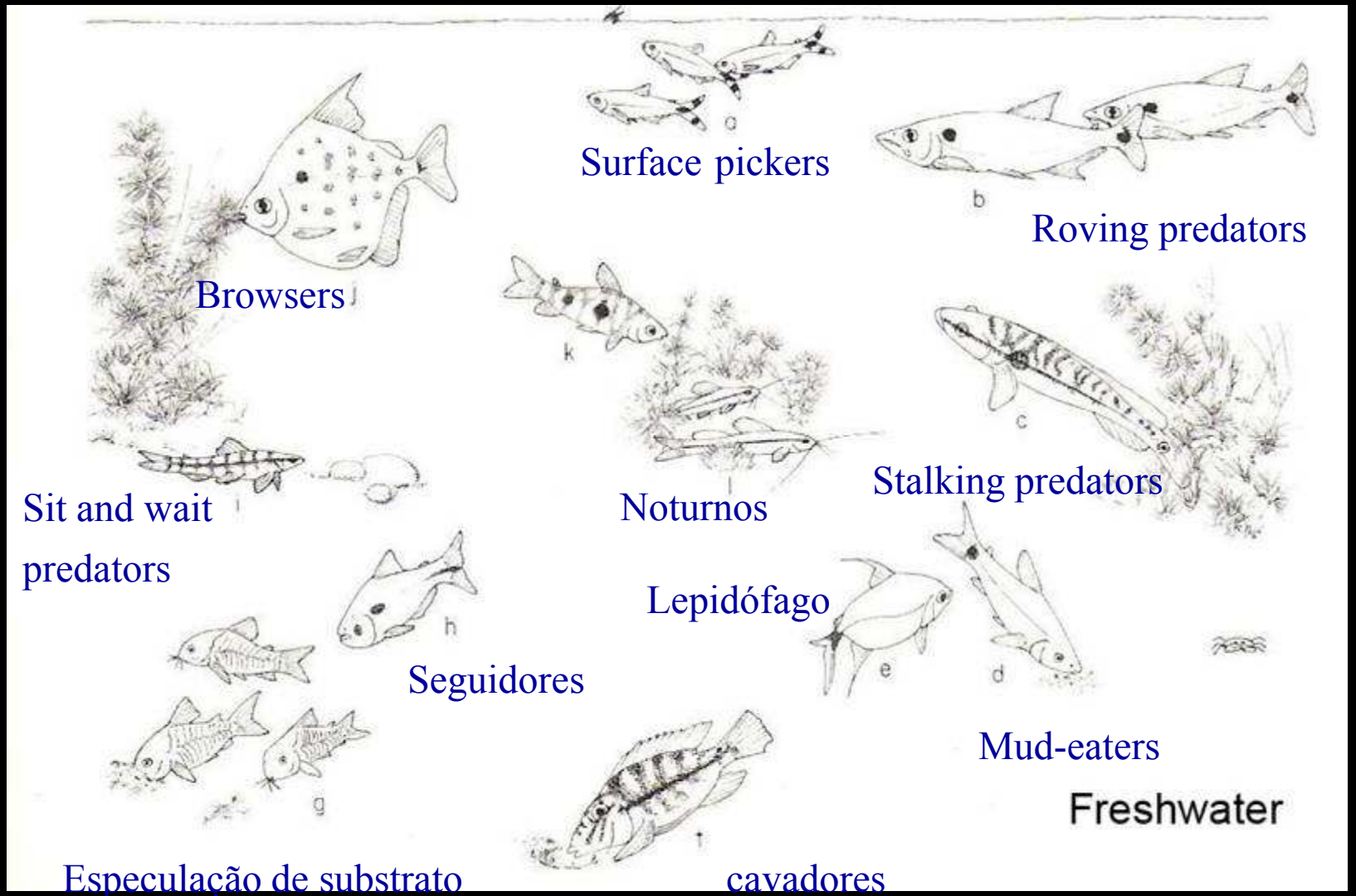
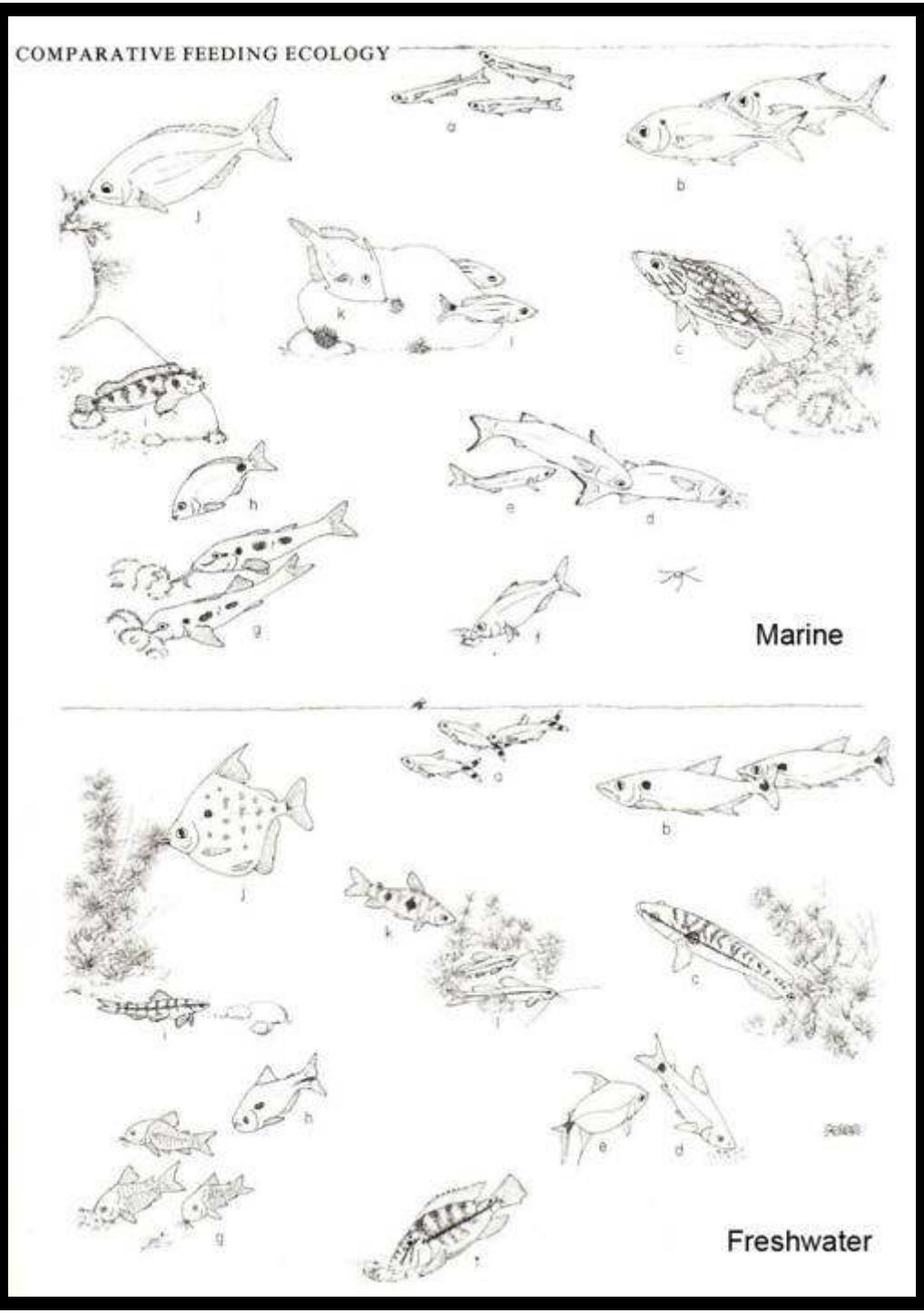
c
d
e
f
g
h
i
j
k
l
Marine


COMPARATIVE FEEDING ECOLOGY
a
Catador de superfície
b
Predador vagueador
j
Podador
Senta e espera
predator
k
l
Noturnos
c
Predador de tocaia
i
h
Seguidores
e
d
Lepidófago
Comedor de areia
g
Especulação de substrato
f
cavadores
Marine


Surface pickers
Roving predators
Browsers
Noturnos
Stalking predators
Sit and wait predators
Lepidófago
Seguidores
Mud-eaters
Freshwater
Especulação de substrato
cavadores


COMPARATIVE FEEDING ECOLOGY
Marine
Freshwater

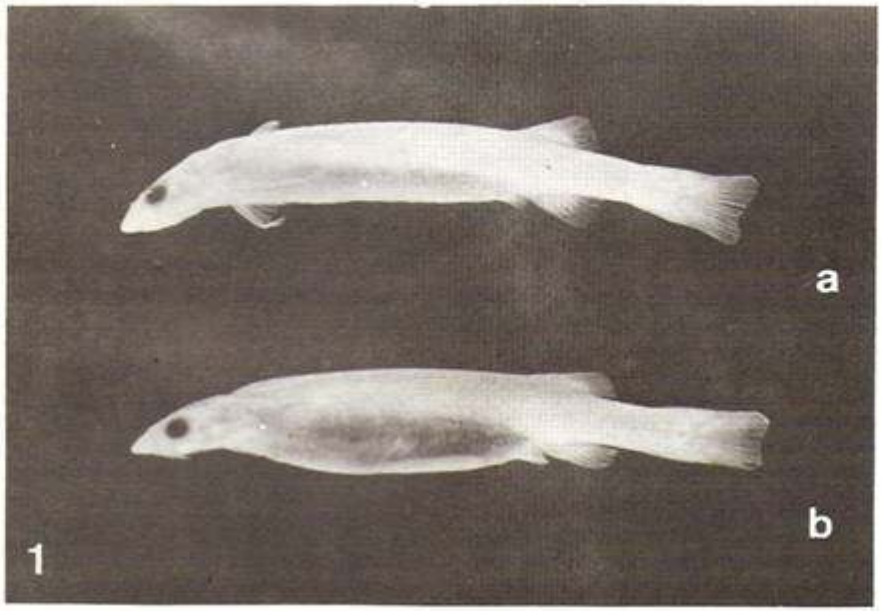


Fig. 1. *Branchioica bertonii:* a) indivíduo adulto, 18 mm (fêmea com ovários desenvolvidos); b) indivíduo adulto, repleto de sangue após abandonar o hospedeiro (note abdômen dilatado e escurecido).

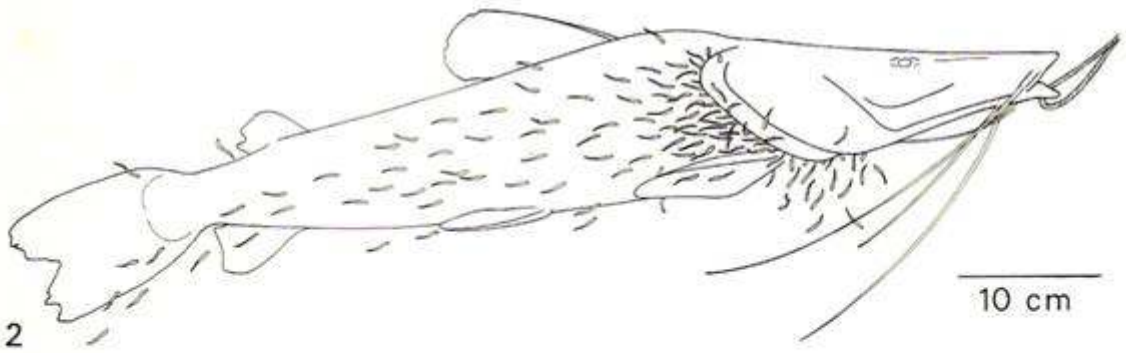
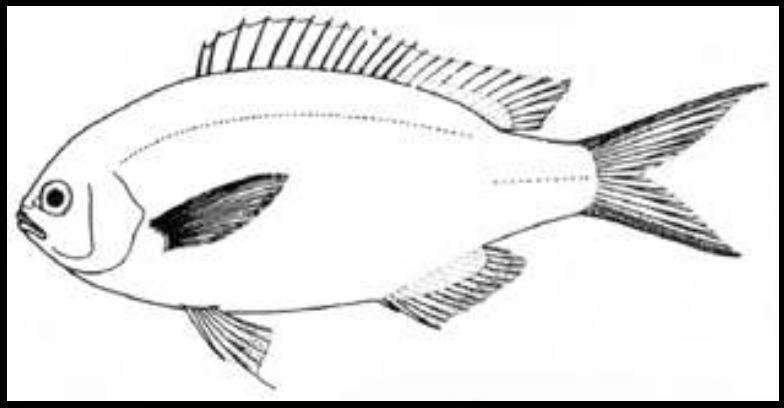
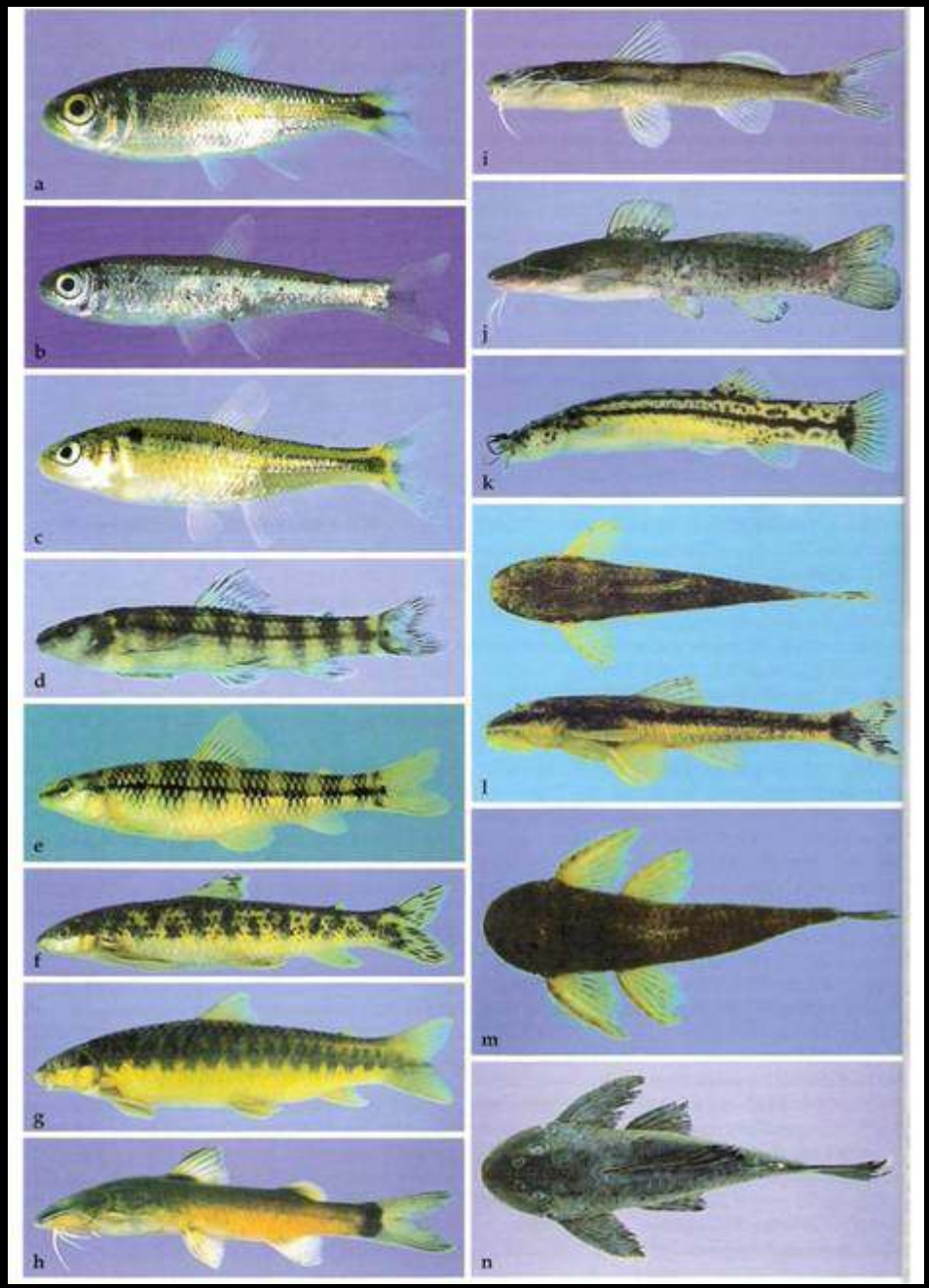


Fig. 2. Agrupamento de *Branchioica bertonii* ao atacar um *Pseudoplatystoma fasciatum* cativo. Note a concentração de hematófagos na região da câmara branquial do hospedeiro e o fluxo de indivíduos ao longo de seu corpo.

Chromis multilineata



Copadichromis mloto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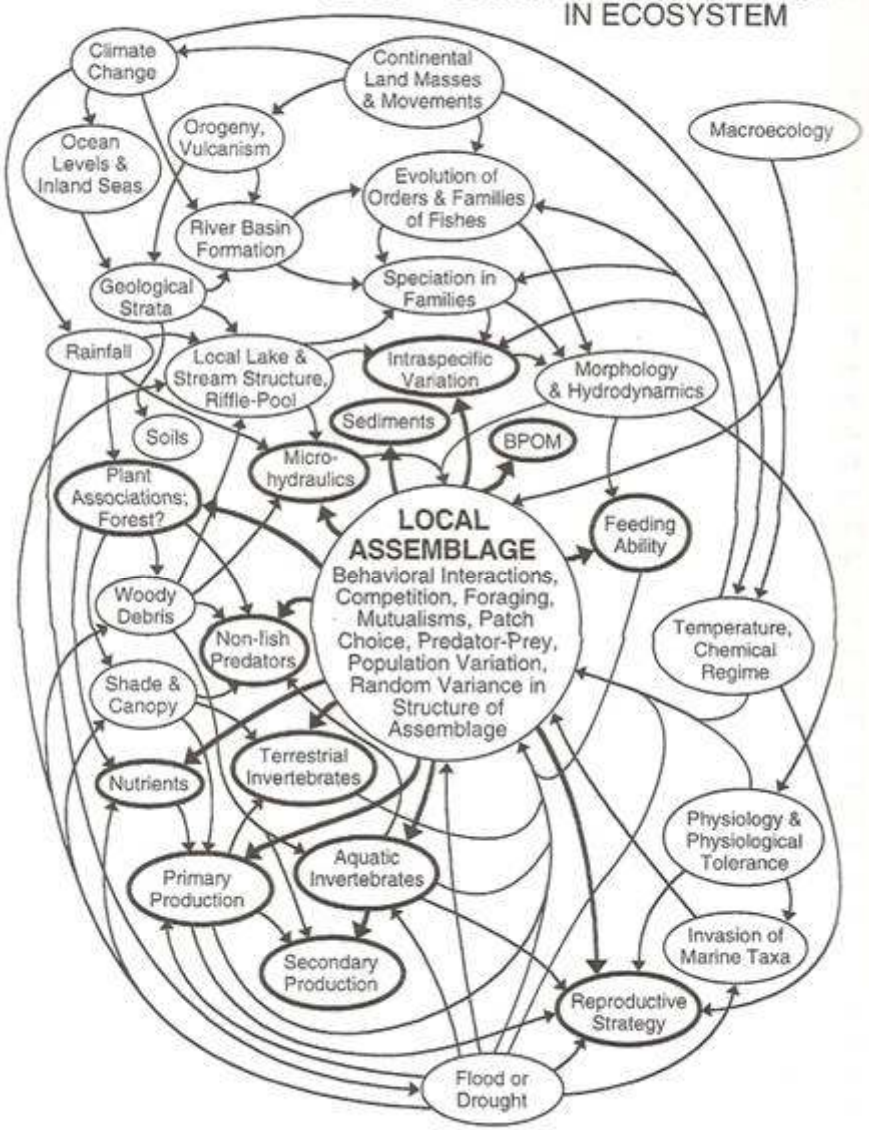

Figure 11.1 Known direct effects (bold) of fish on their ecosystems. Factors as in Figure 1.2.

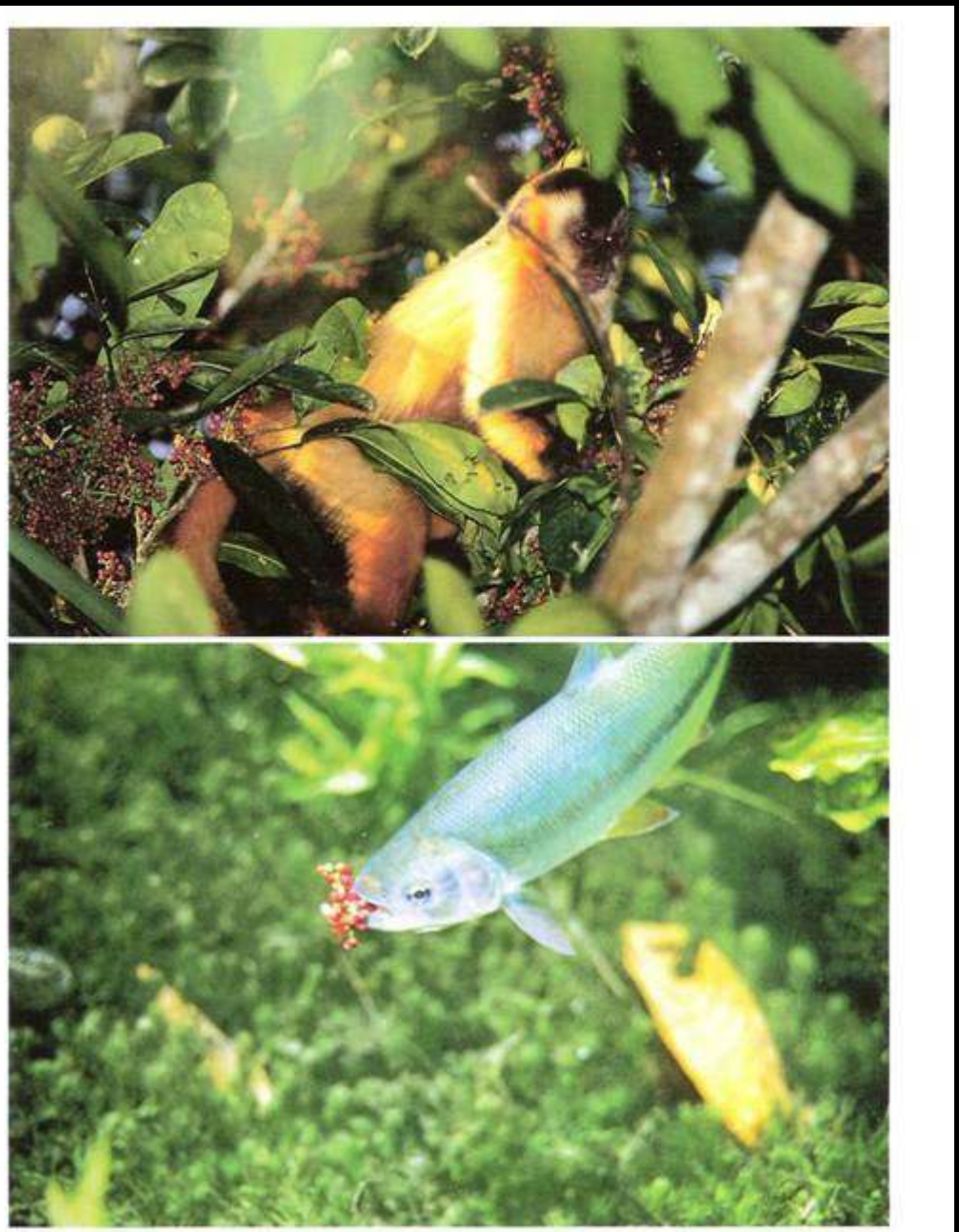

Fig. 2. Capuchin monkey, *Cebus apella*, feeding on the fruits of *Zanthoxyllum riedelianum* (upper). Fruits of *Zanthoxyllum* dropped in the water are fed upon by *Brycon microlepis* (lower).

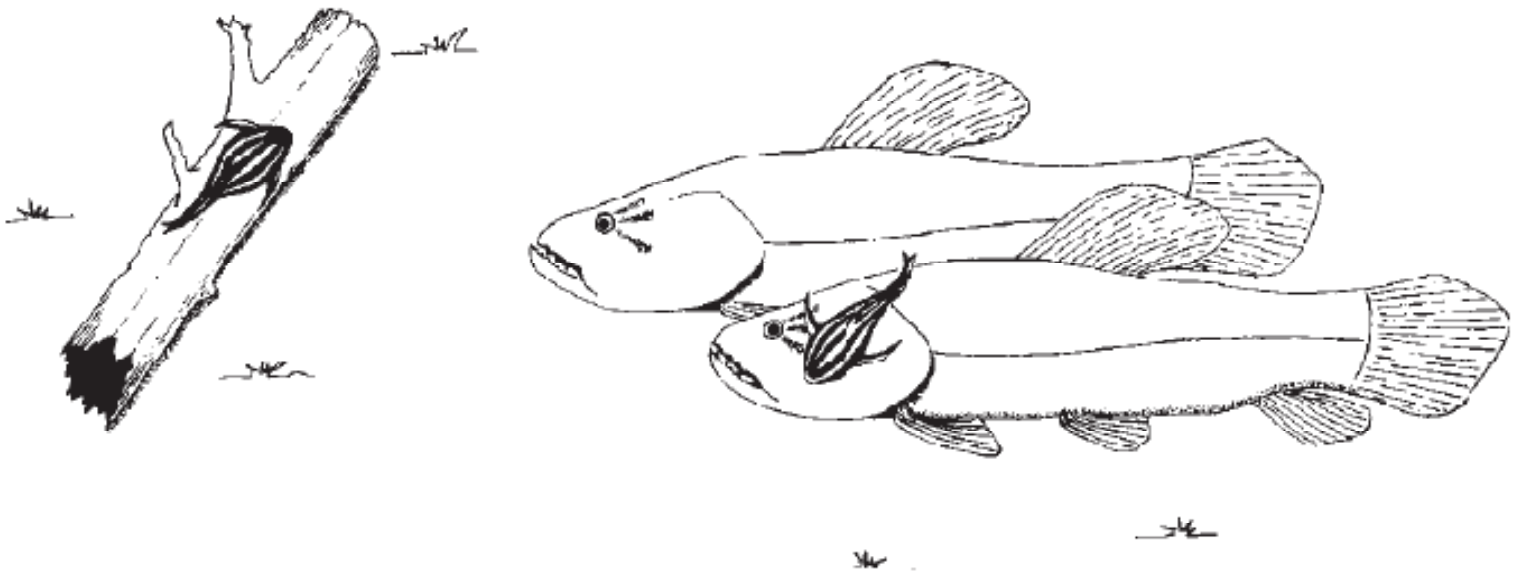

Fig. 1. Two juvenile catfish *Platydoras costatus,* one mouthing at the head of piscivorous erythrinid *Hoplias malabaricus*, and other poised under a submerged trunk in stream bottom.

Agradecimentos por maravilhosas imagens e ensinamentos:

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J P Krajewski
David Bellwood