

## PREHISTORY OF HUMAN SOCIETIES IN THE *CERRADO* (CENTRAL BRAZIL)

### *The first settlements*

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# Introduction

- Example of human/environment interactions in a context of a first settlement of an area
- Definition of the *Cerrado* biome
- Description of technology and ways of live of the first humans in Central Brazil
- Considerations about the use of the notion of human adaptation to his environment for early prehistoric periods (hunters and gatherers)

# The *Cerrado* biome

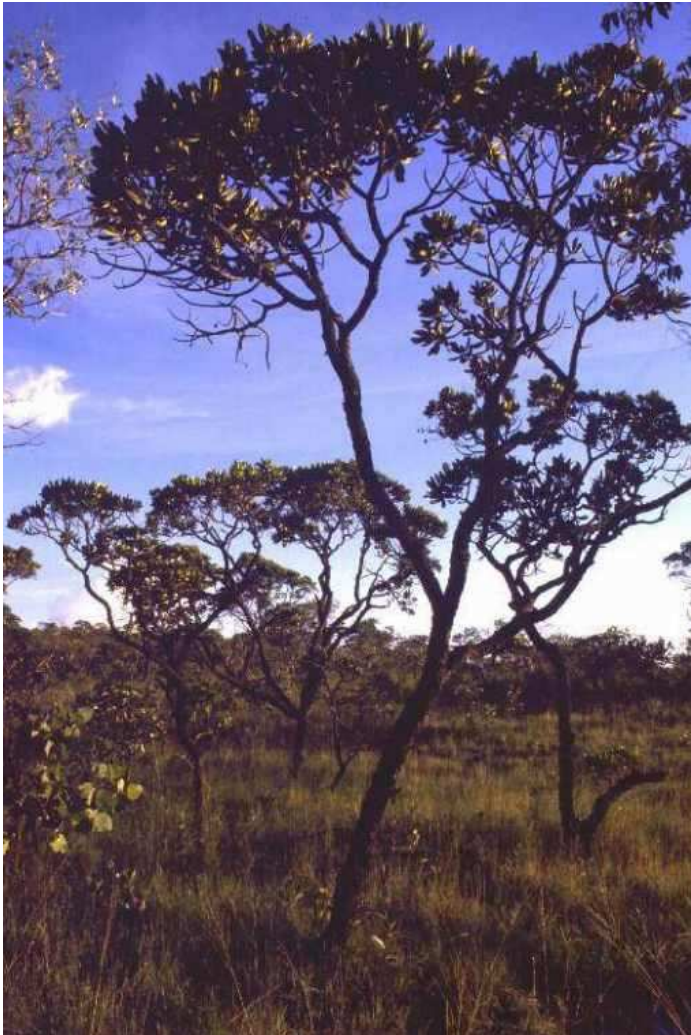


IBGE

- Central Brazil
- 2<sup>nd</sup> largest biome of Brazil
- 2 millions km<sup>2</sup> (almost ¼ of the Brazilian territory and ½ of the European Union)

# The *Cerrado* biome

- Open vegetation
- Classified as an “arboreal savanna”
- Very rich biodiversity



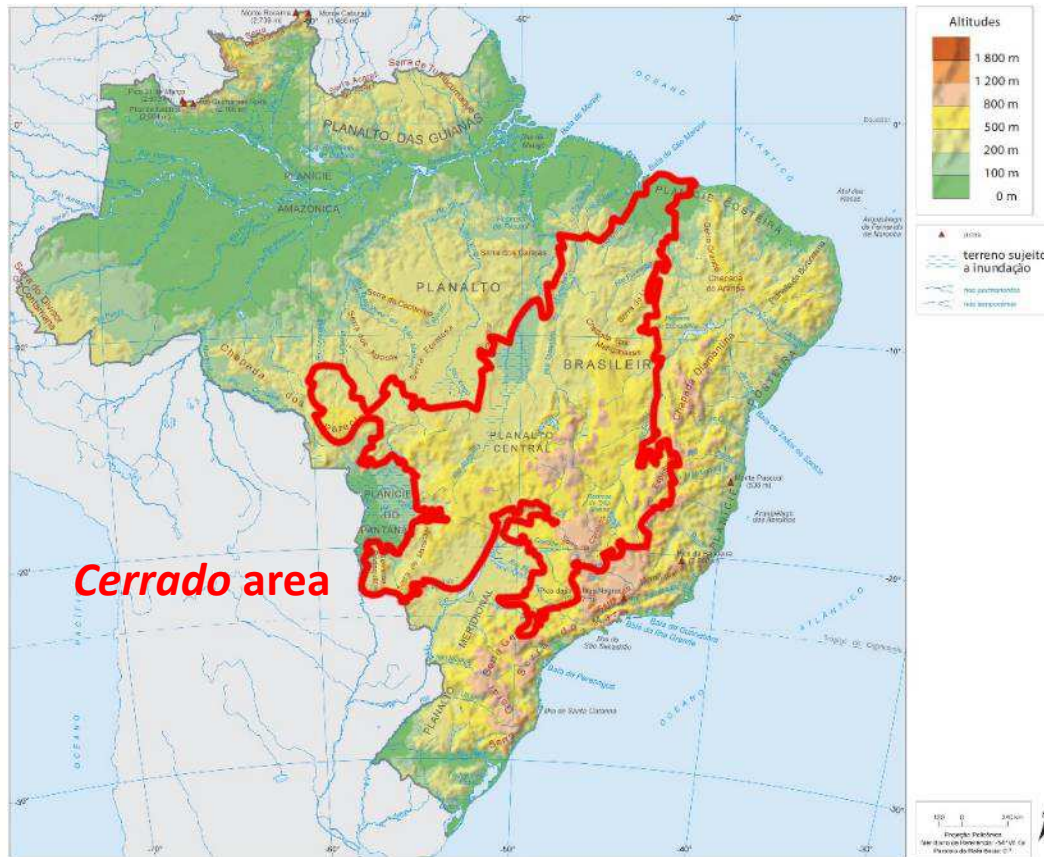
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# Physical context

## The Brazilian Central Plateau



- Precambrian shield
- Most of the plateau is between 500 and 1.000 m a.s.l.
- Uneven reliefs

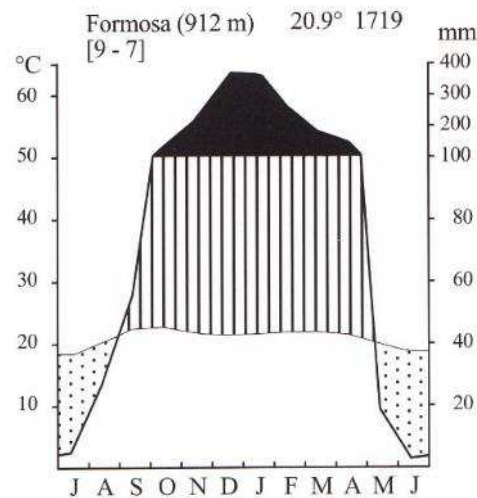


IBGE

# Climate



Gottssberger, 2006



- Hot and subhumid tropical climate
- Temperature is stable throughout the year (20/25°C)
- Annual rainfall range: 1.000 – 2.000 mm, but very strong seasonality of precipitation:

“Summer”  
(November to April):  
Rainy season

“Winter”  
(May to October):  
Dry season

# The *Cerrado* vegetation

- Arboreal savanna
- Permanent grass cover
- Trees with large leaves, contorted trunk, thick bark
- Interactions vegetation/fires



WWF



Fig. 74. A spectacularly contorted *Qualea parviflora* (Vochysiaceae) tree covered in thick, longitudinally fissured bark. Águas Emendadas biological reserve, Federal District, September 1998, end of dry season.

Gottsberger, 2006



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# Vegetation physiognomy

Diversity of the landscapes in the *Cerrado*:

a continuum from forest to open grassland

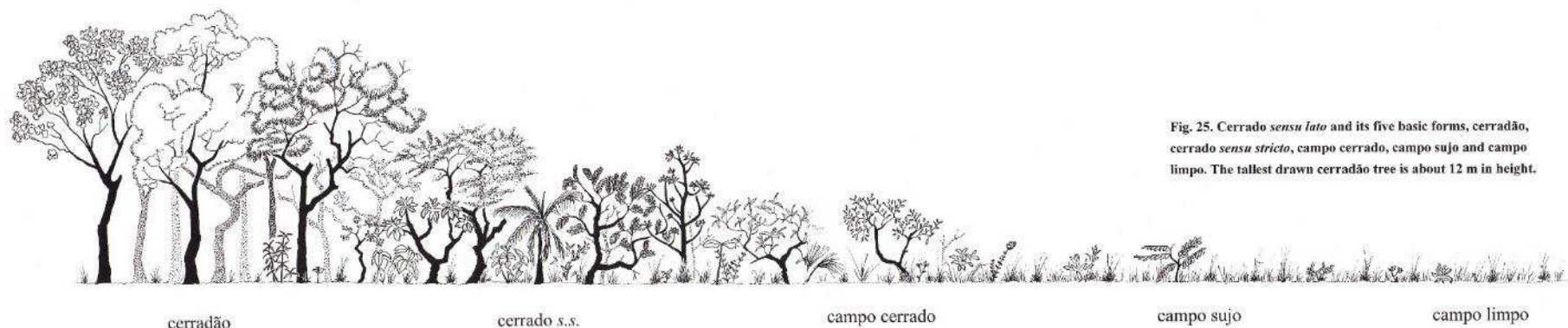


Fig. 25. Cerrado *sensu lato* and its five basic forms, cerradão, cerrado *sensu stricto*, campo cerrado, campo sujo and campo limpo. The tallest drawn cerradão tree is about 12 m in height.



# Cerradão

## Forest

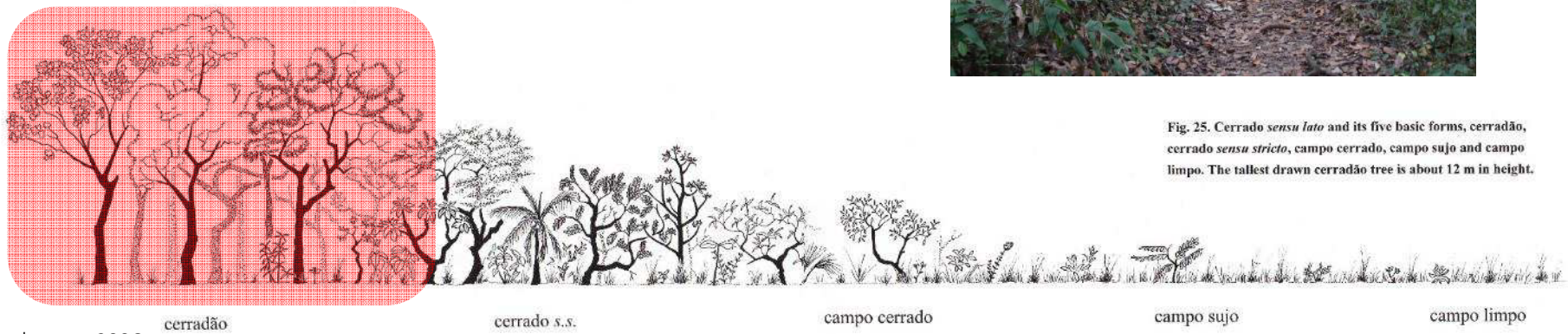
- Arboreal cover > 60%
- Canopy at about 7m (with some trees until 15m)



ICMBio



Fig. 25. Cerrado *sensu lato* and its five basic forms, cerradão, cerrado *sensu stricto*, campo cerrado, campo sujo and campo limpo. The tallest drawn cerradão tree is about 12 m in height.



Gottsberger, 2006

# *Cerrado stricto sensu*

Arboreal savanna

- Dominated by trees (around 3 m high) and shrubs
- Continuous grass layer



ICMBio

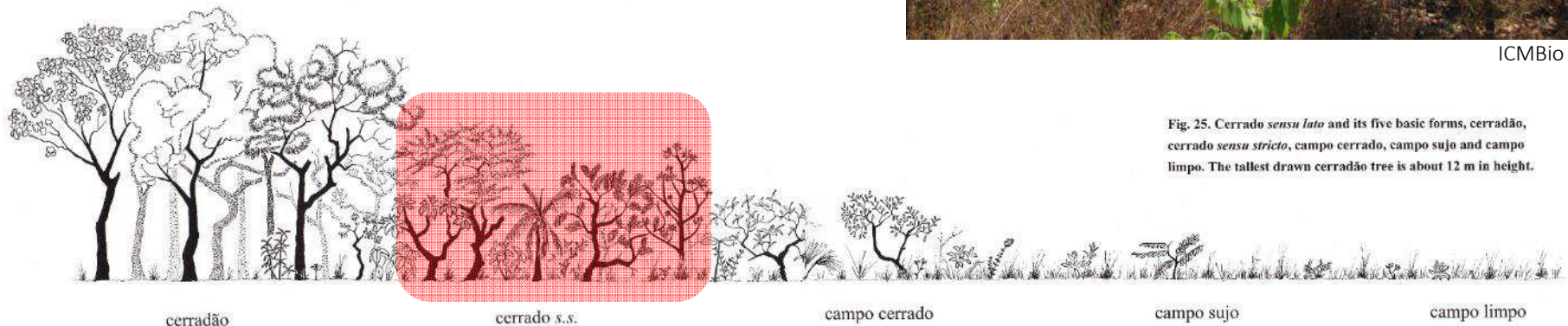


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# Campo cerrado

Shrubby savanna

- Continuous grass layer
- Low trees (until 2m high) and shrubs, from 10 to 40% cover



Fig. 35. Campo cerrado in foreground is a mixture of closely and more widely set low trees and scrubs (slope in background on right shows some areas of campo sujo and campo limpo). São José dos Campos, São Paulo, April 1977, end of rainy season.

Gottsberger, 2006

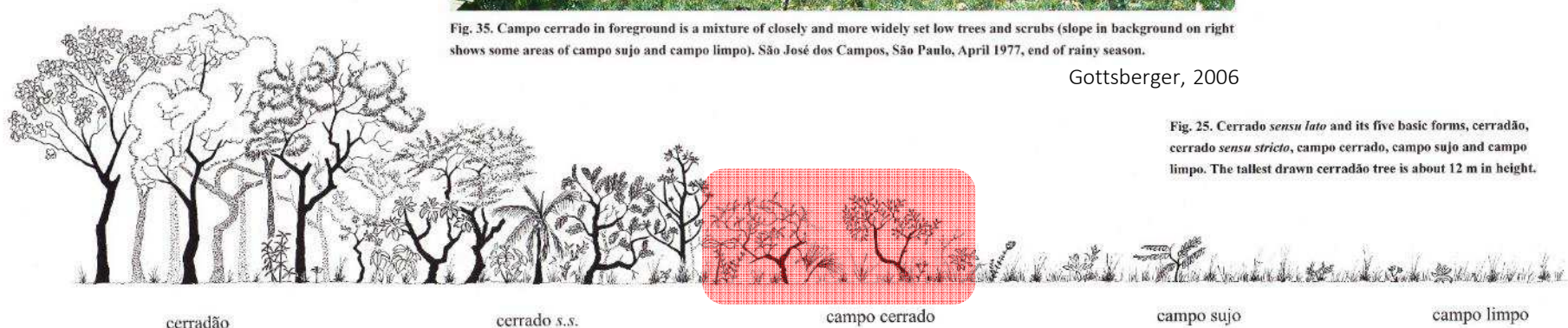


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Gottsberger, 2006

cerradão

cerrado s.s.

campo cerrado

campo sujo

campo limpo

# Campo sujo and Campo limpo

Grasslands, with some scattered trees and shrubs (*Campo sujo*), or not (*Campo limpo*).



ICMBio



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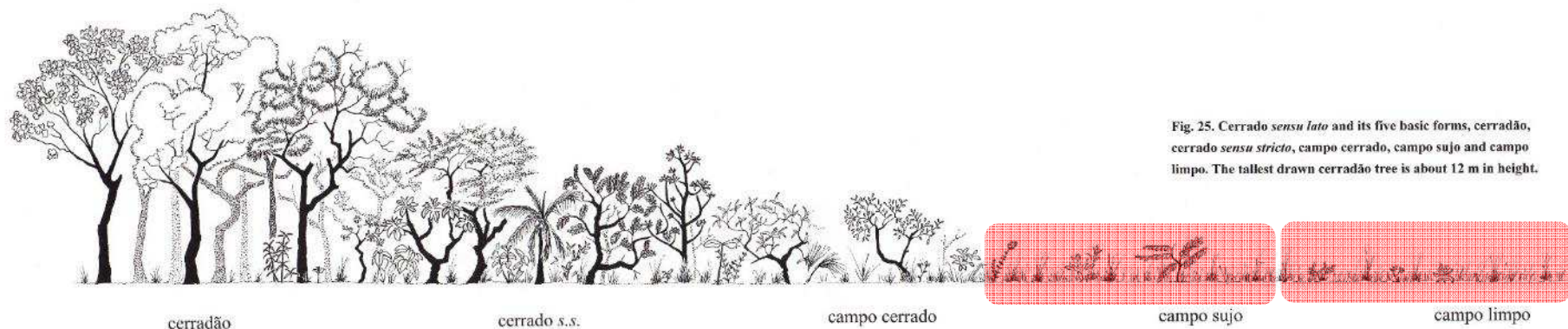


Fig. 25. Cerrado *sensu lato* and its five basic forms, cerradão, cerrado *sensu stricto*, campo cerrado, campo sujo and campo limpo. The tallest drawn cerradão tree is about 12 m in height.

# Gallery forest

Dense forest along the valleys  
(canopy around 15m)



Fig. 46. Undisturbed cerrado landscape, campo limpo and campo sujo cerrado on a Lithosol slope in foreground, gallery forest in midground, and campo cerrado and cerrado s.s. in background. At Marco Fundamental, south of Planaltina, Federal District, December 1975, rainy season (photograph G. Eiten).

Gottsberger, 2006



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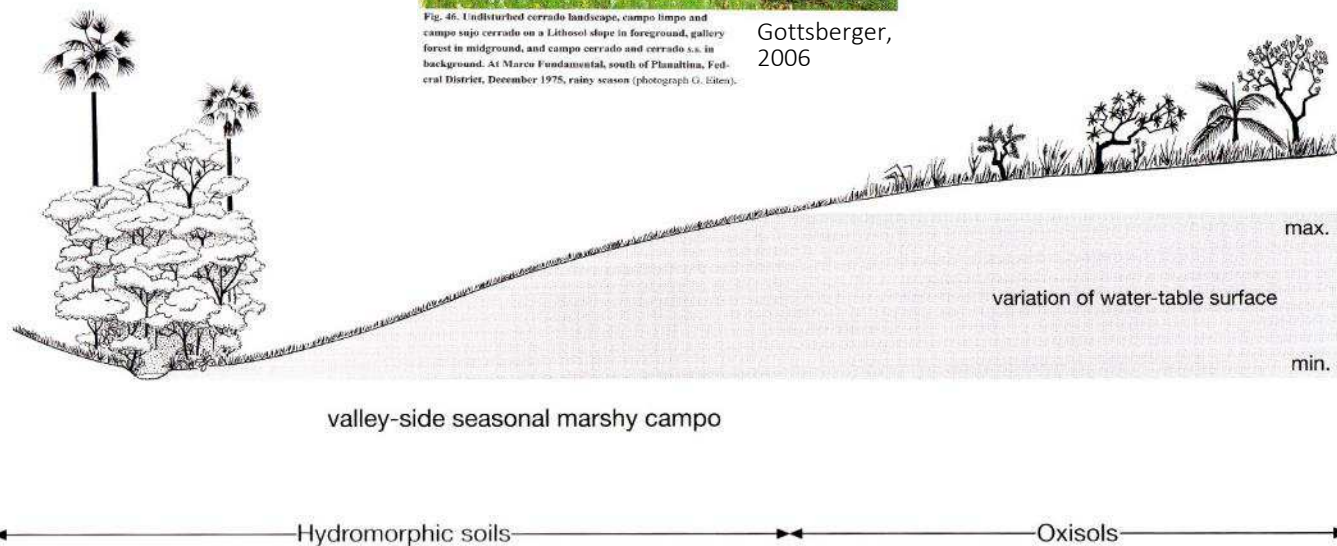


Fig. 43. Cerrado landscape showing upland cerrados on Oxisols and gallery forests along brooks, bordered by valley-side marshy campos on hydromorphic soils. Marshy valley-side campos can be occupied by earthmounds, called hummocks. Based on Askew et al. (1970), Eiten (1975), Furley (1986), Furley and Ratter (1988), Oliveira-Filho et al. (1989).  
Gottsberger, 2006

# *Vereda*

Marshy grassland in alluvial plains with *Buritis* palms.



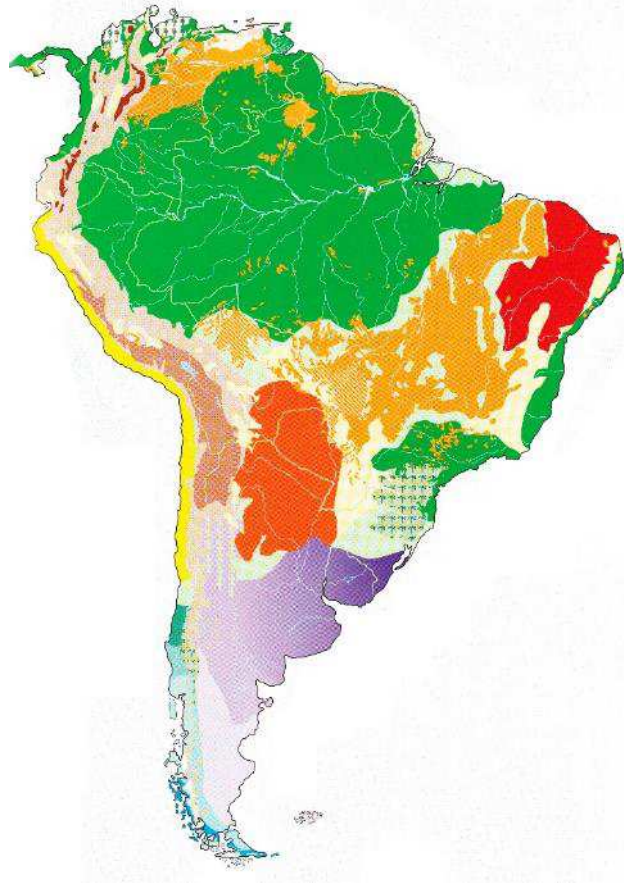
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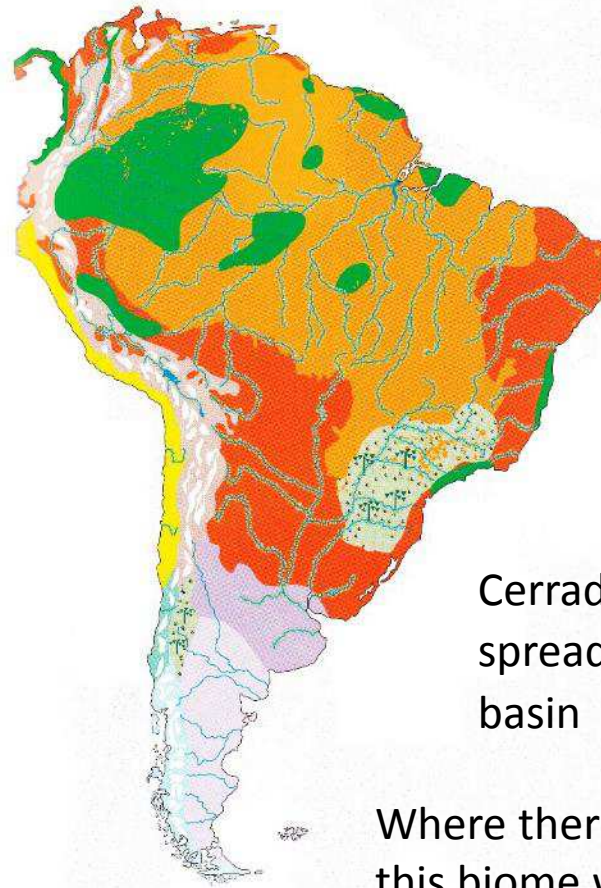
# The *Cerrado* during Prehistory

Today



Gottsberger, 2006

Late Pleistocene (20.000 to 14.000 BP)  
(hypothesized map)



More arid in the tropics  
during the glaciation  
maxima

Cerrado vegetation was  
spread in the Amazon  
basin

Where there is *Cerrado* today,  
this biome was yet present at  
least from the late Pleistocene

# *Cerrado's* assets for human occupation during prehistory

- Terrestrial circulation facilitated by open vegetation (including in historical periods)
- Very rich biodiversity, with a large amount of animal and vegetal food resources, relatively easy to access

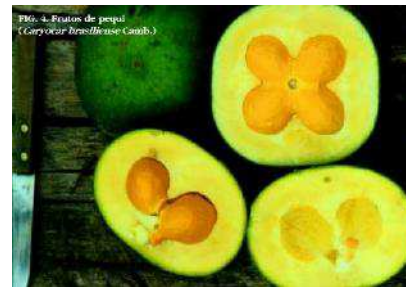


FIG. 4. Frutos de pequi (*Caryocarpus brasiliense* Camb.)



FIG. 5. Frutos de ariçuna (*Aimonia Czasczalka* Mart.)



FIG. 9. Frutos de cagaita (*Eugenia dysenterica* DC.)



FIG. 10. Frutos de puriti (*Mauritia vitifera* Mart.)

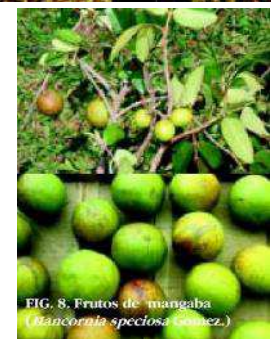


FIG. 8. Frutos de mangaba (*Mangorola speciosa* Cassiez.)



# Prehistory of Central Brazil

First peopling in the Late Pleistocene



1: Serra da Capivara region

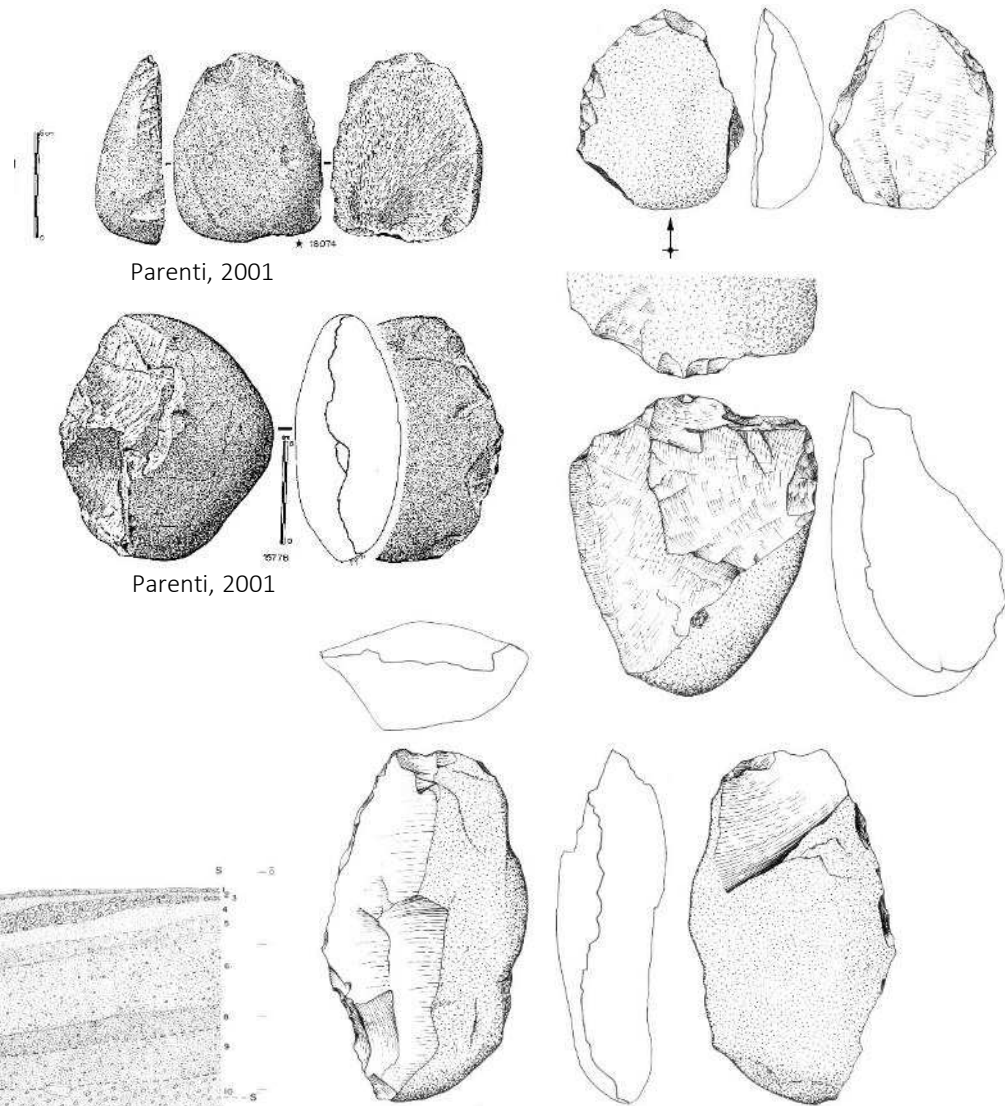
- Boqueirão da Pedra Furada
- Sítio do Meio
- Tira-Peia
- Vale da Pedra Furada

2: Santa Elina

# First peopling

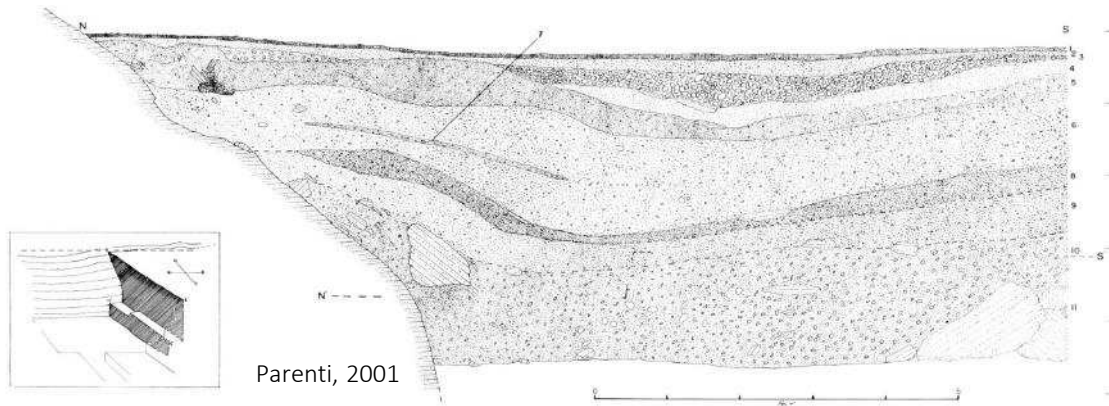
## Boqueirão da Pedra Furada

From 49.000 BP



Parenti, 2001

Parenti, 2001



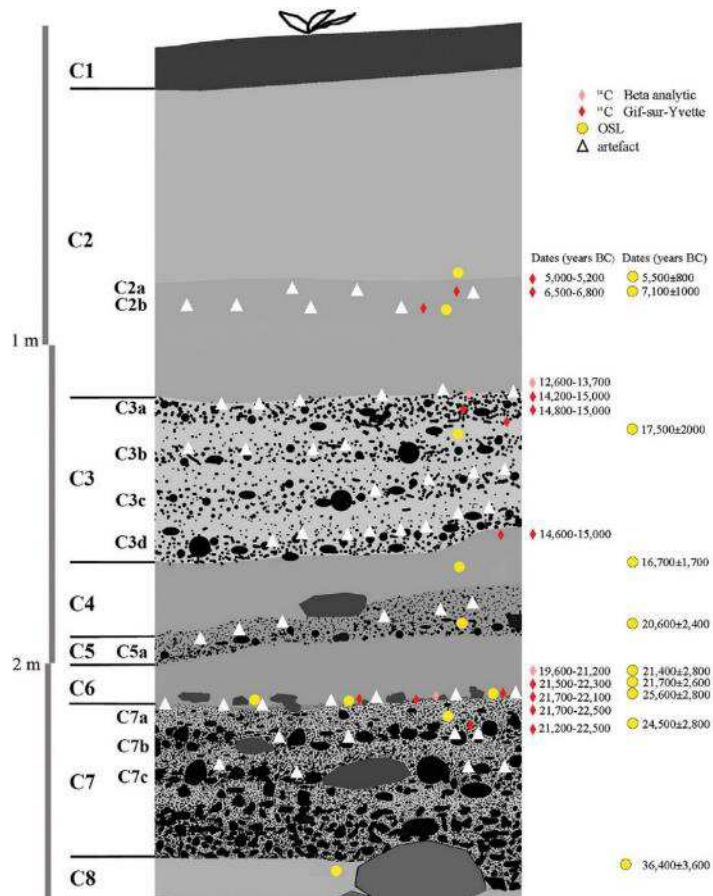
Parenti, 2001

Lithic tools made on quartz and quartzite pebbles and flakes

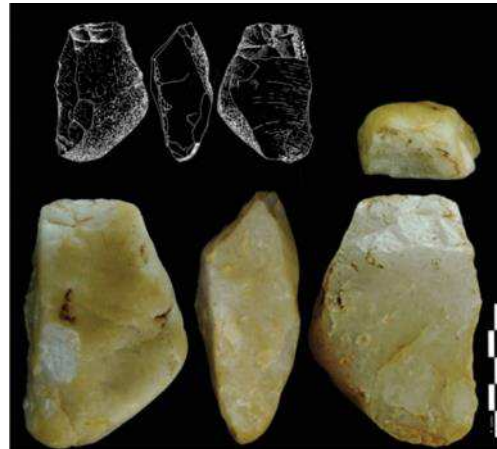
# First peopling

## Vale da Pedra Furada

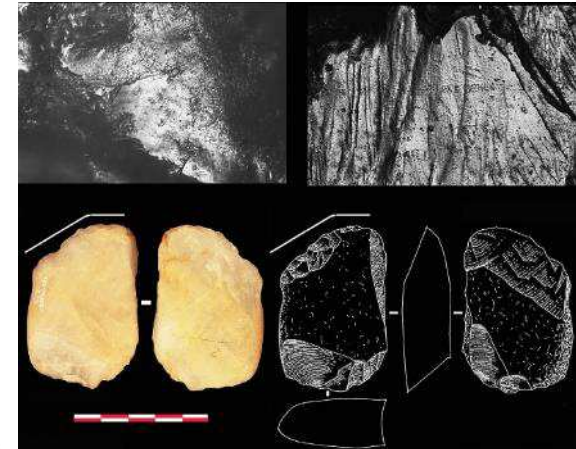
From 22.000 BP



Boëda *et al.*, 2014



Boëda *et al.*, 2014



Boëda *et al.*, 2014

Quartz lithic tools with use wear

## Tira-Peia

From 20.000 BP



Lahaye *et al.*, 2013

Lithic tool made on quartzite pebble

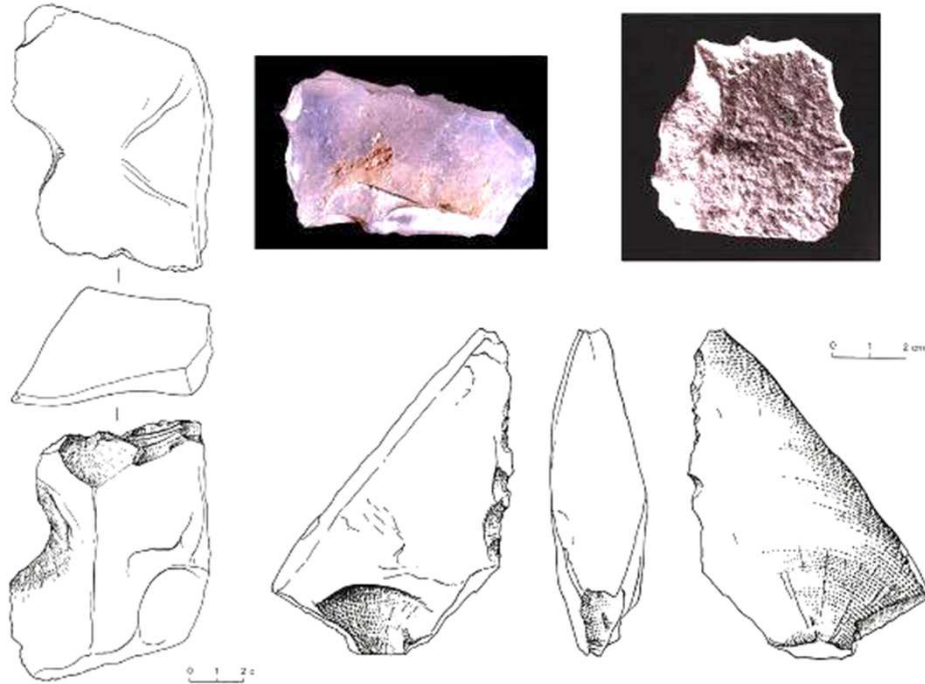


Lahaye *et al.*, 2013

# First peopling

## Santa Elina

From 25.000 BP



Vilhena Vialou, 2005

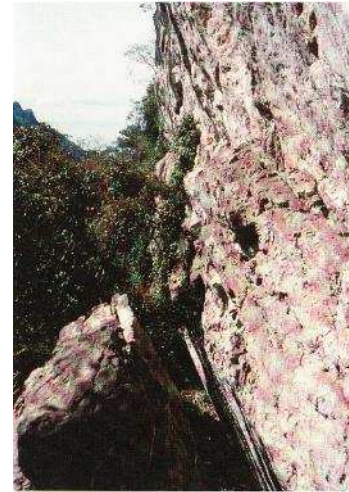


FIGURA 4. Vista geral das paredes calcárias que limitam a área de ocupação pré-histórica do abrigo de Santa Elina.

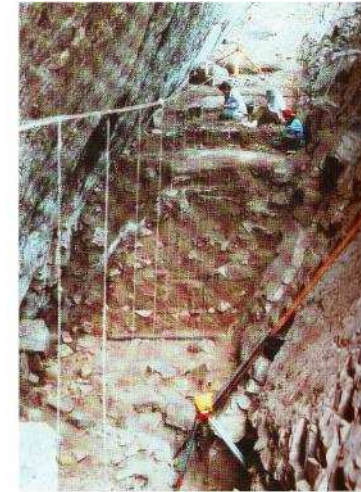


FIGURA 5. Corte estratigráfico 28/30. A, B, C, contendo a sequência de ocupações e os solos evidenciados, do Holoceno, nível superior e Pleistoceno, nível inferior; abrigo de Santa Elina.

Vilhena Vialou, 2005

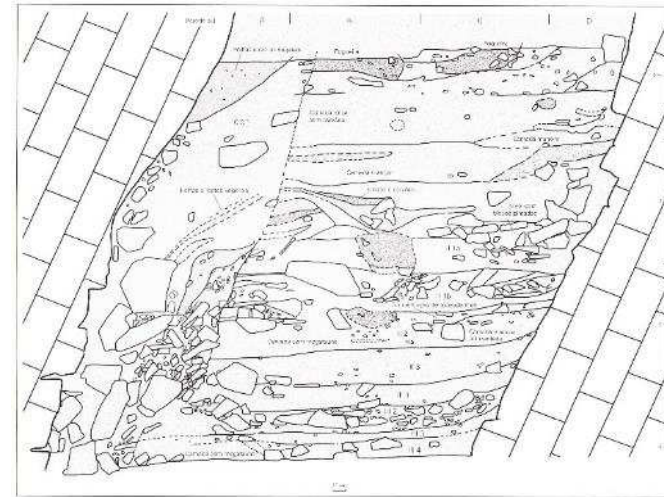


FIGURA 6. Perfil estratigráfico 29/30 Chave, Santa Elina.

Vilhena Vialou, 2005

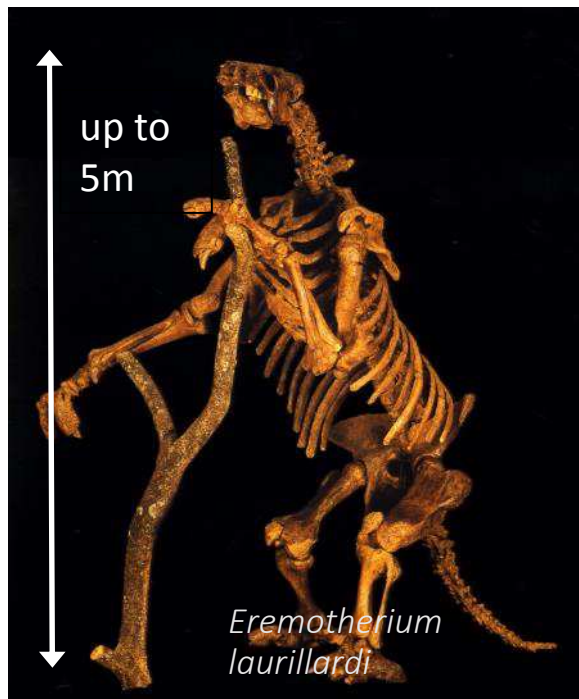
# First peopling

## Fossil Megafauna

Until the end of the Pleistocene, the first human societies live together with the American fossil megafauna

Relationship between Humans and Megafauna in Central Brazil is not clear (hunting? scavenging? ignorance?)

Giant sloth



Guérin & Faure, 2004

Giant armadillo



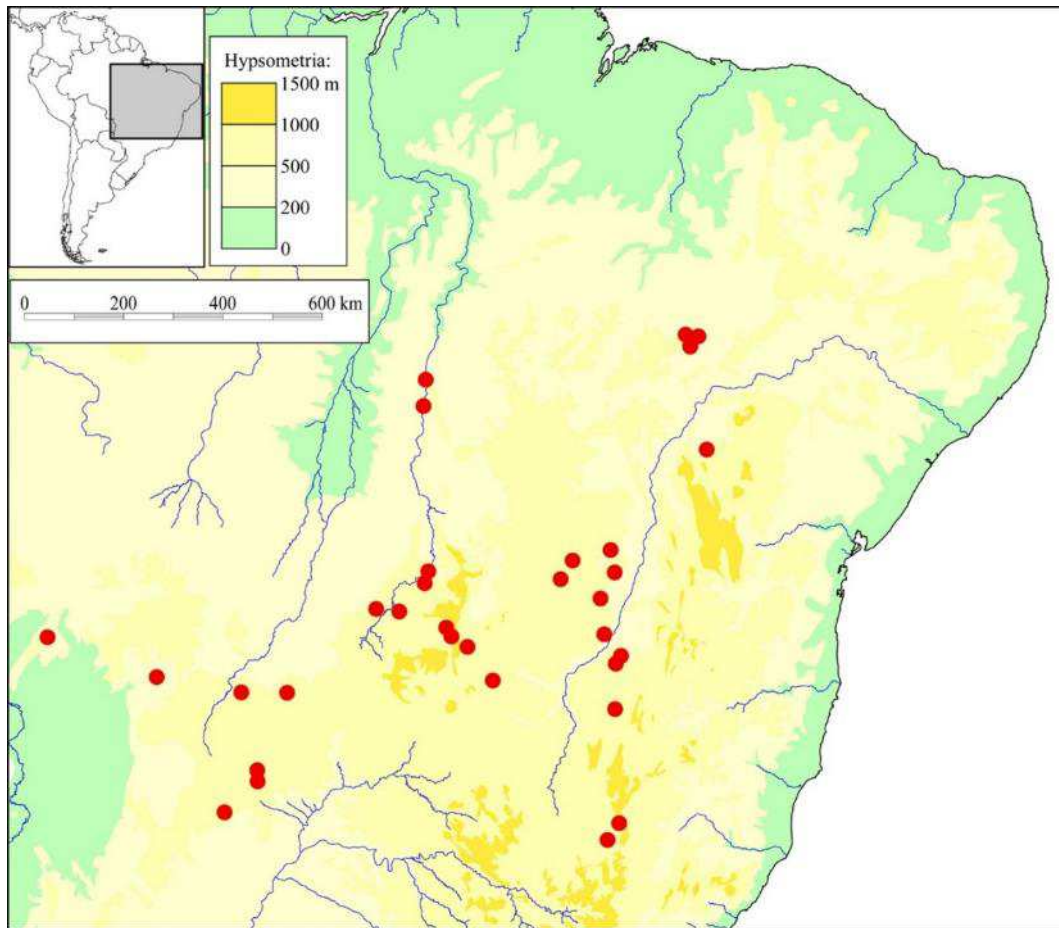
Saber-toothed tiger



Guérin & Faure, 2004

# Prehistory of Central Brazil

First conspicuous settlement from Pleistocene-Holocene transition



Main archaeological sites in Central Brazil from 14.000 to 9.000 BP

Dozens of archaeological sites dated between 14.000 and 9.000 BP

Most of them are attributed to the **ITAPARICA TRADITION** (Itaparica technocomplex)

# Prehistory of Central Brazil during Pleistocene-Holocene transition and early Holocene

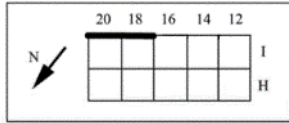
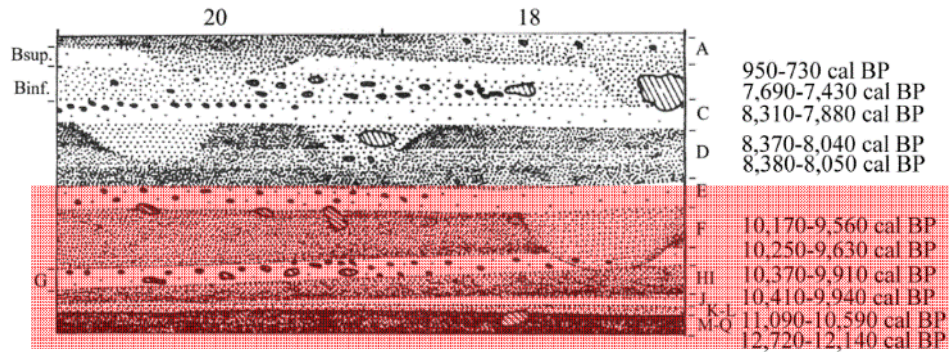
## Lithic technology in the Itaparica technocomplex



Unifacially shaped artefacts (*“lesmas”, “unifaces”, “plano-convex tools”...*)  
Not just a *“guide-fossil”*

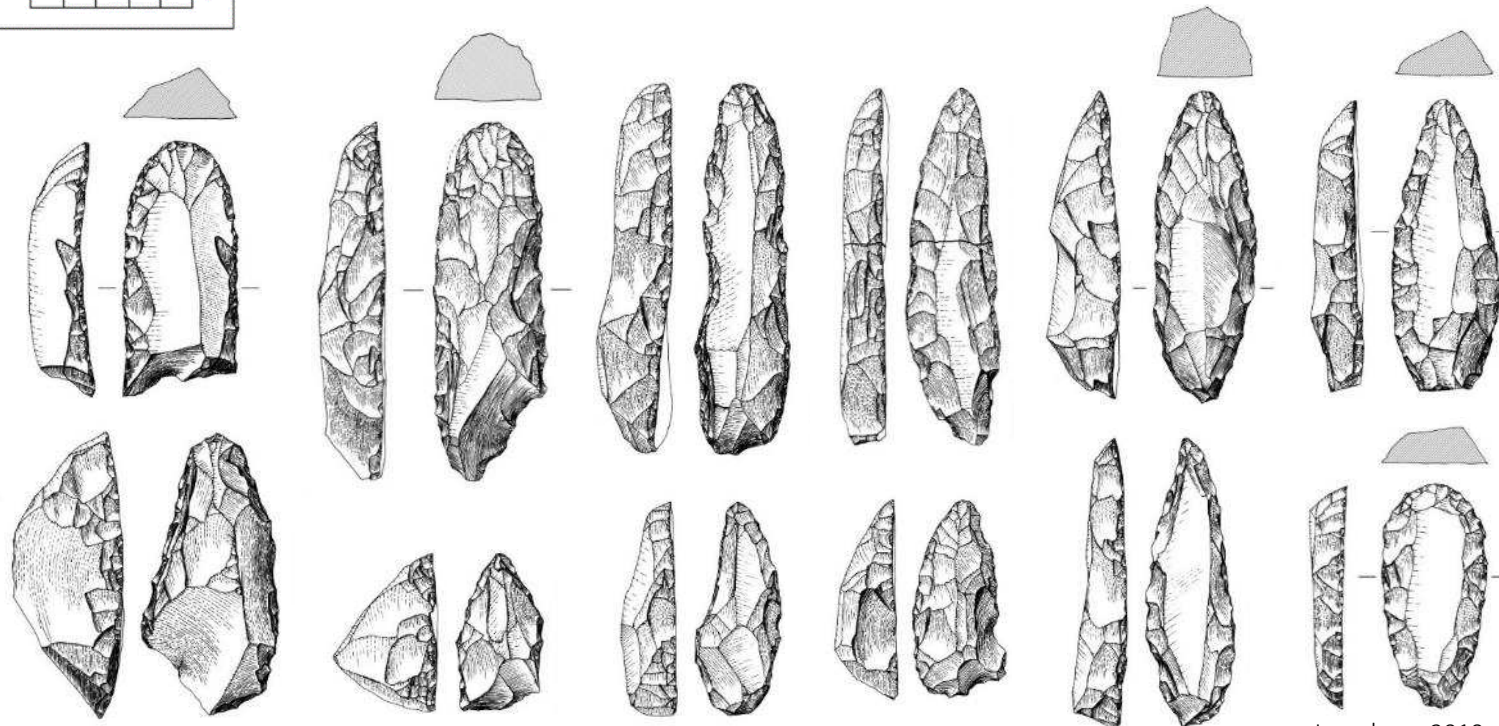
# Lithic technology in the Itaparica technocomplex

## GO-JA-01 Rockshelter



0 1 m  
Schmitz, 1989

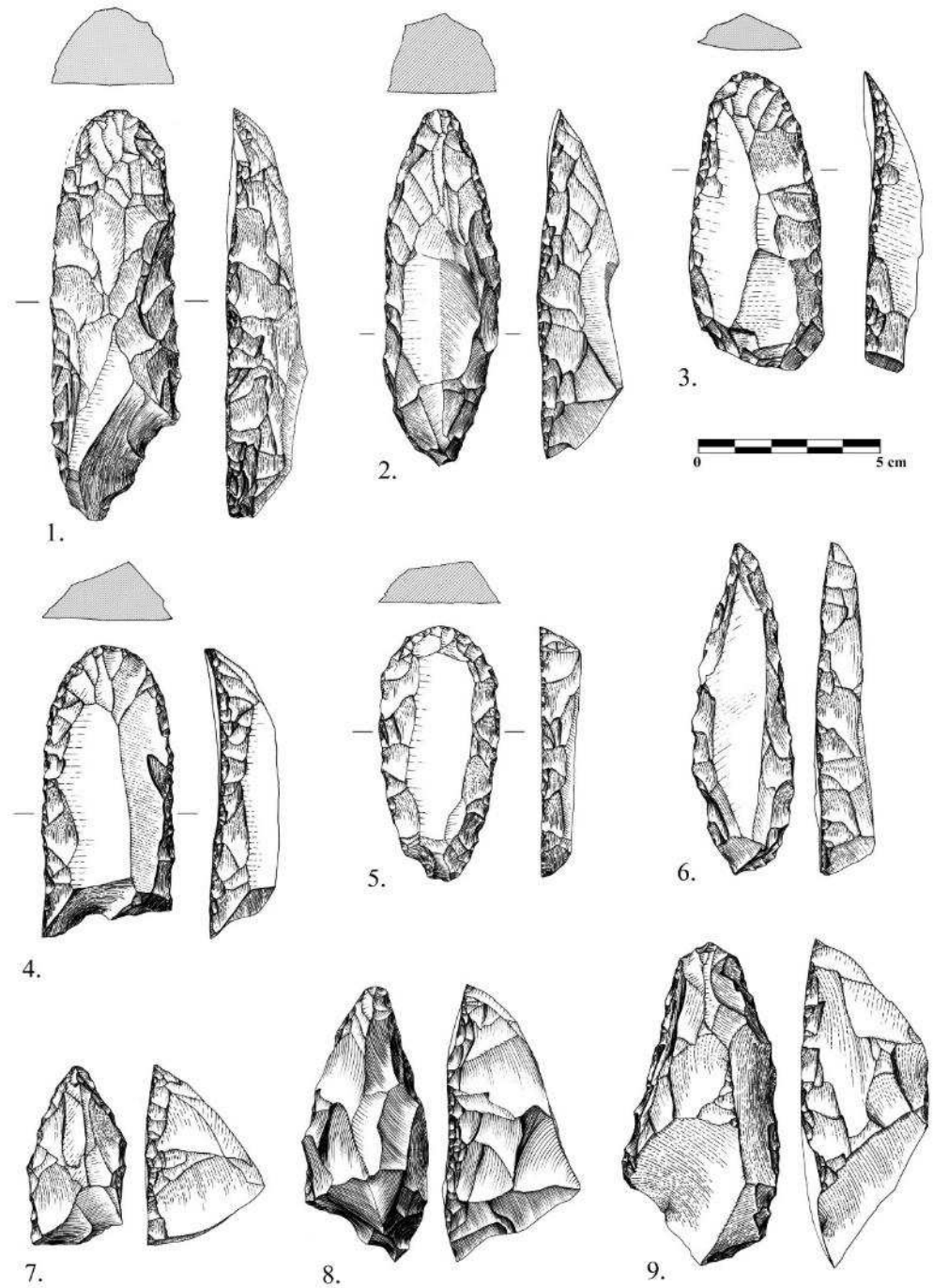
Itaparica layers



Lourdeau, 2010



# Unifacially shaped artifacts

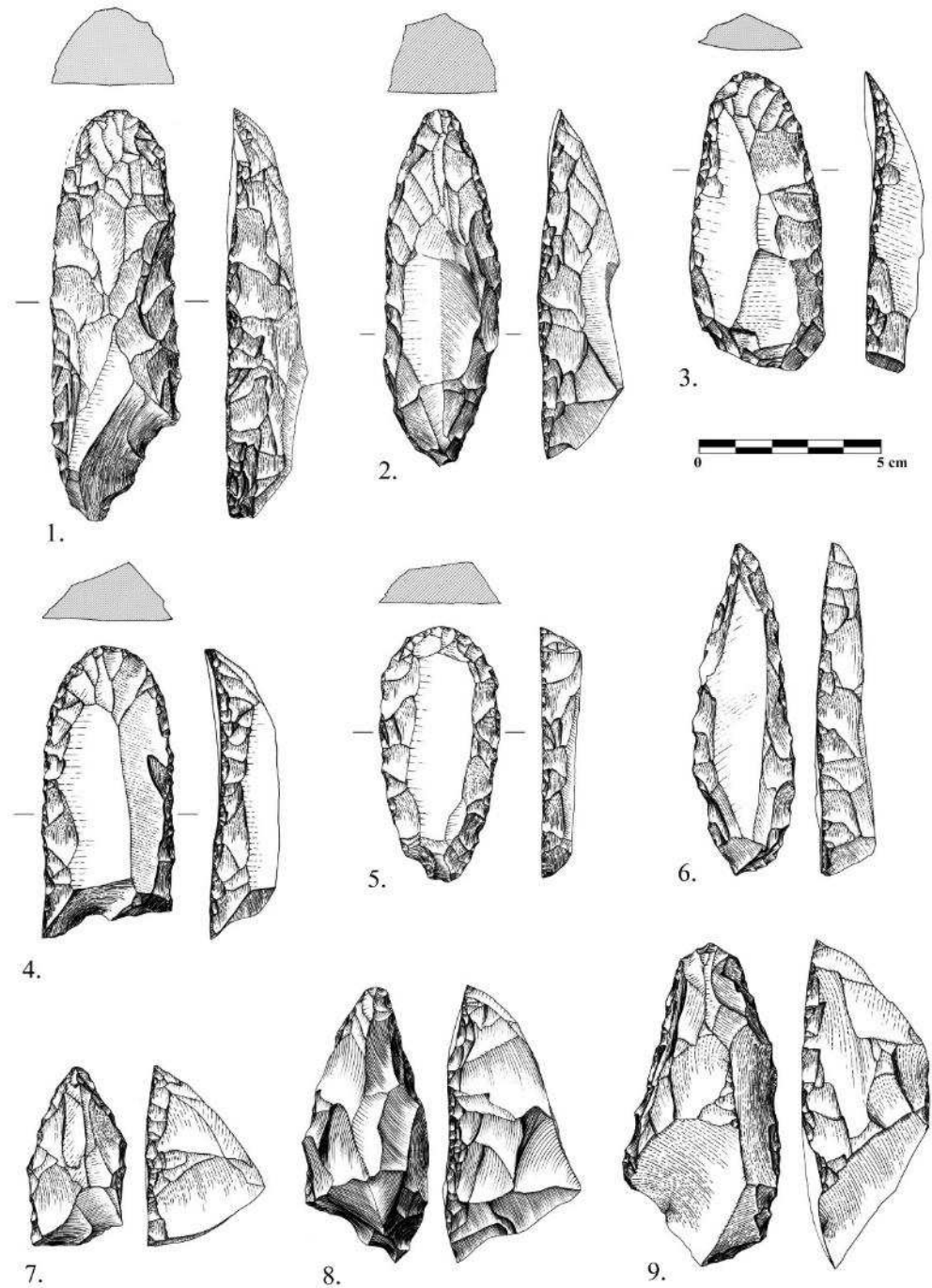


# Unifacially shaped artifacts

Concept



1- An elongated blank with a flat face

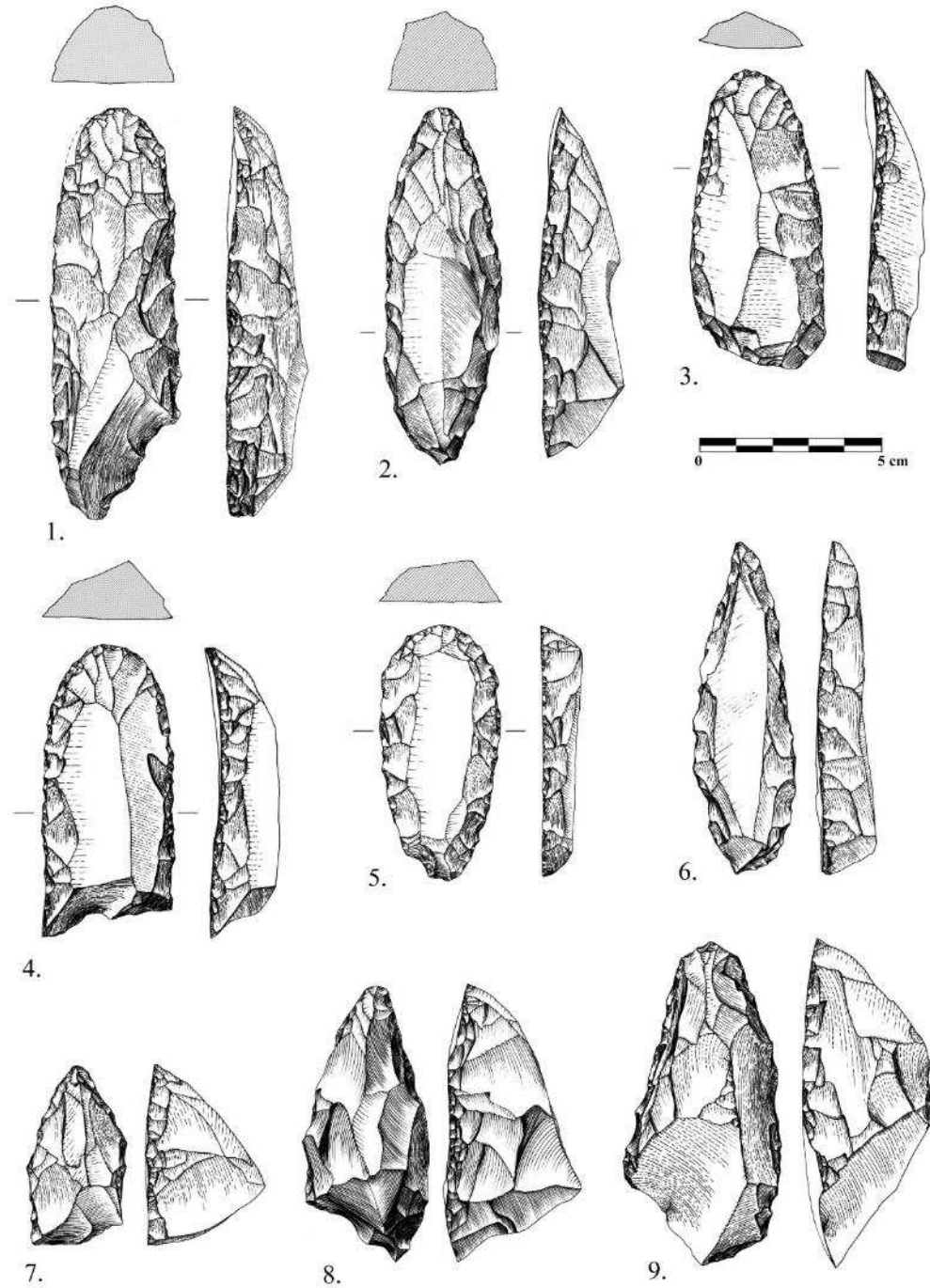


# Unifacially shaped artifacts

Concept

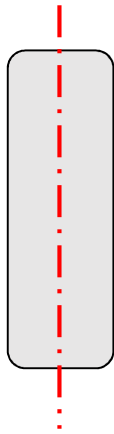


- 1- An elongated blank with a flat face
- 2- Produced by unifacial shaping

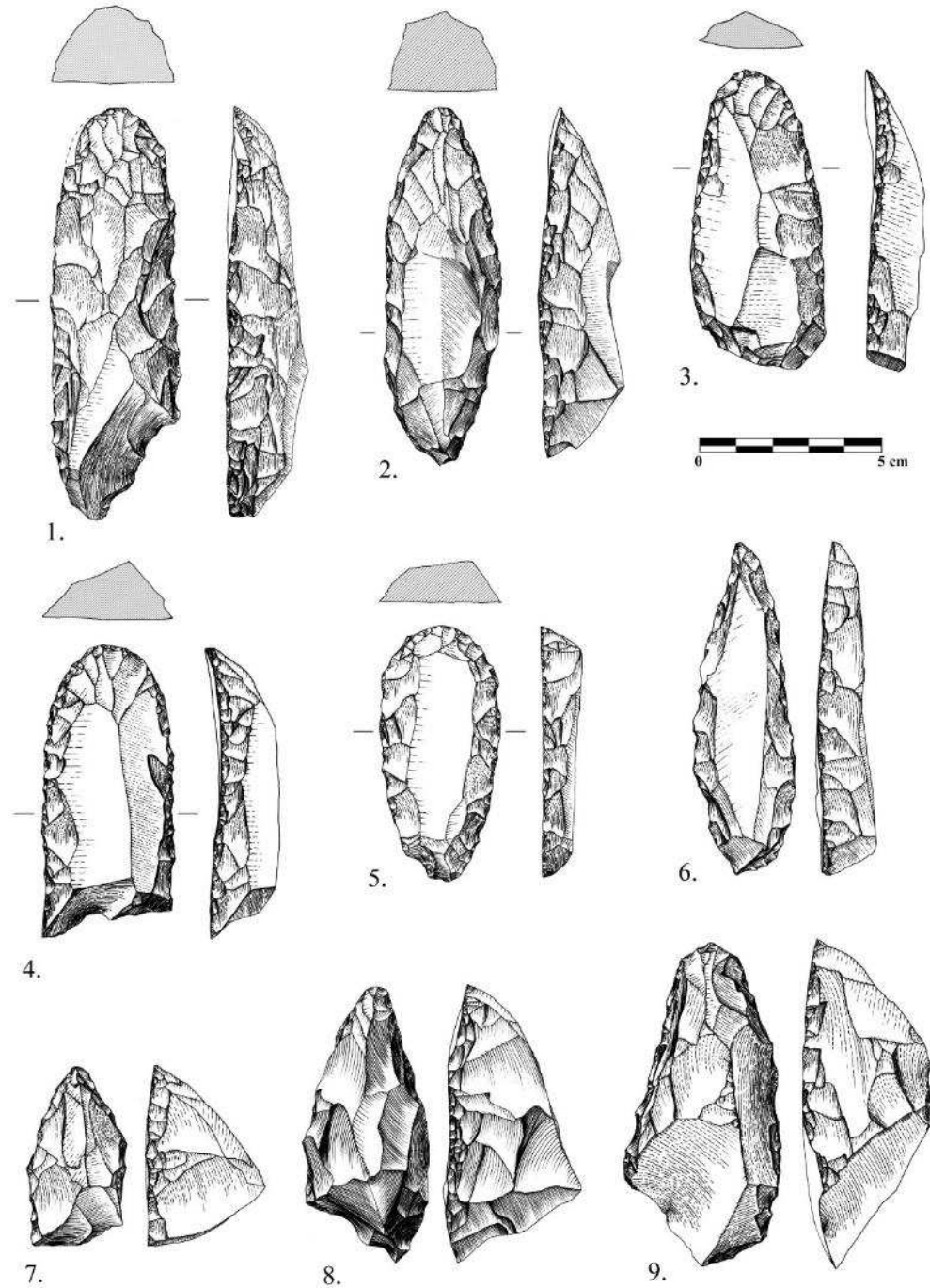


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Concept

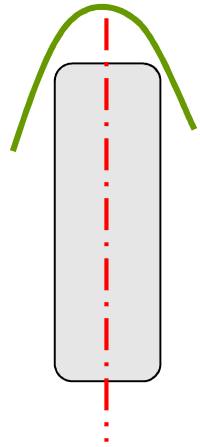


- 1- An elongated blank with a flat face
- 2- Produced by unifacial shaping
- 3- Symmetrical volume along the longitudinal axis

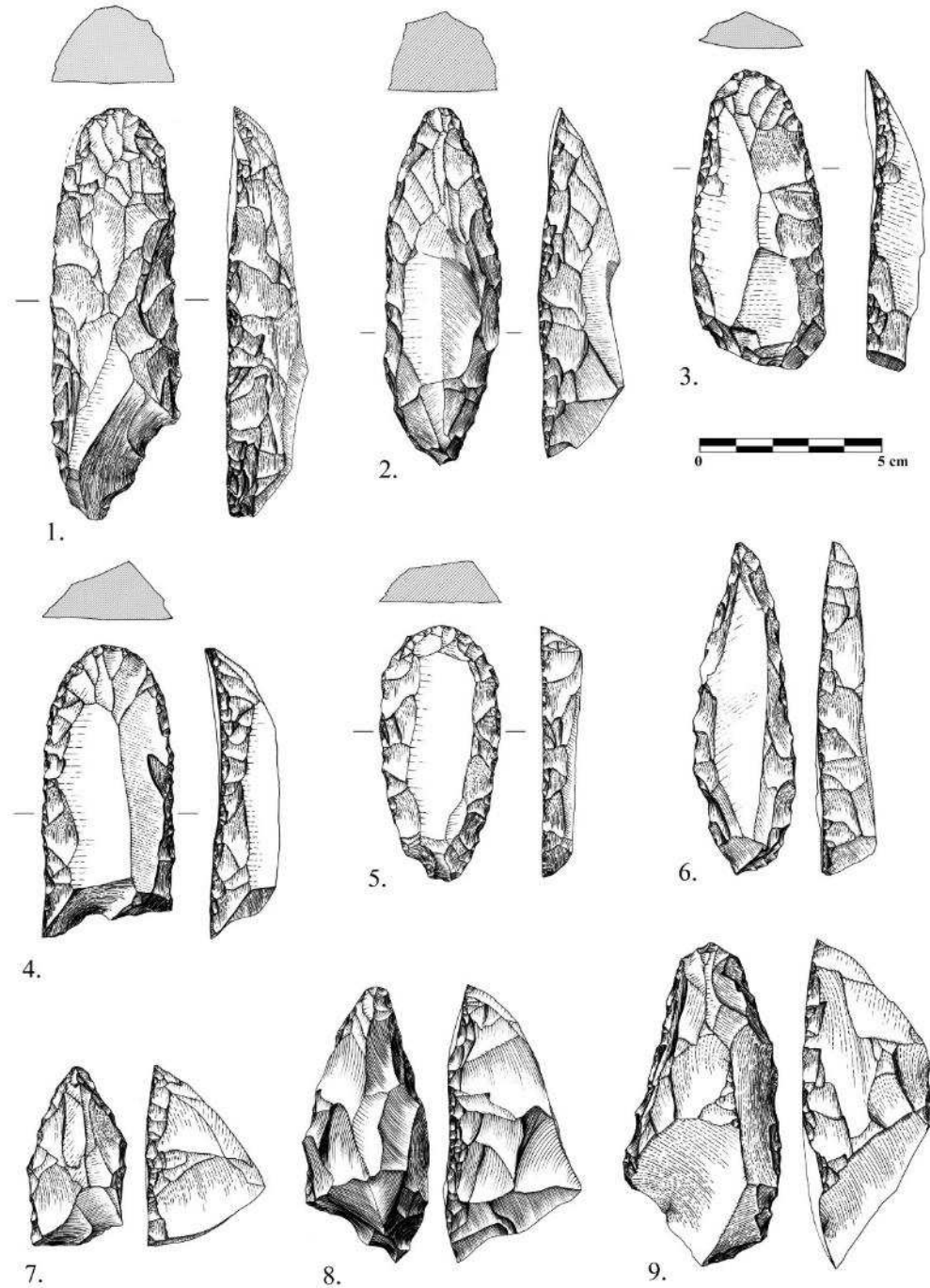


# Unifacially shaped artifacts

Concept



- 1- An elongated blank with a flat face
- 2- Produced by unifacial shaping
- 3- Symmetrical volume along the longitudinal axis
- 4- A cutting-edge at one end

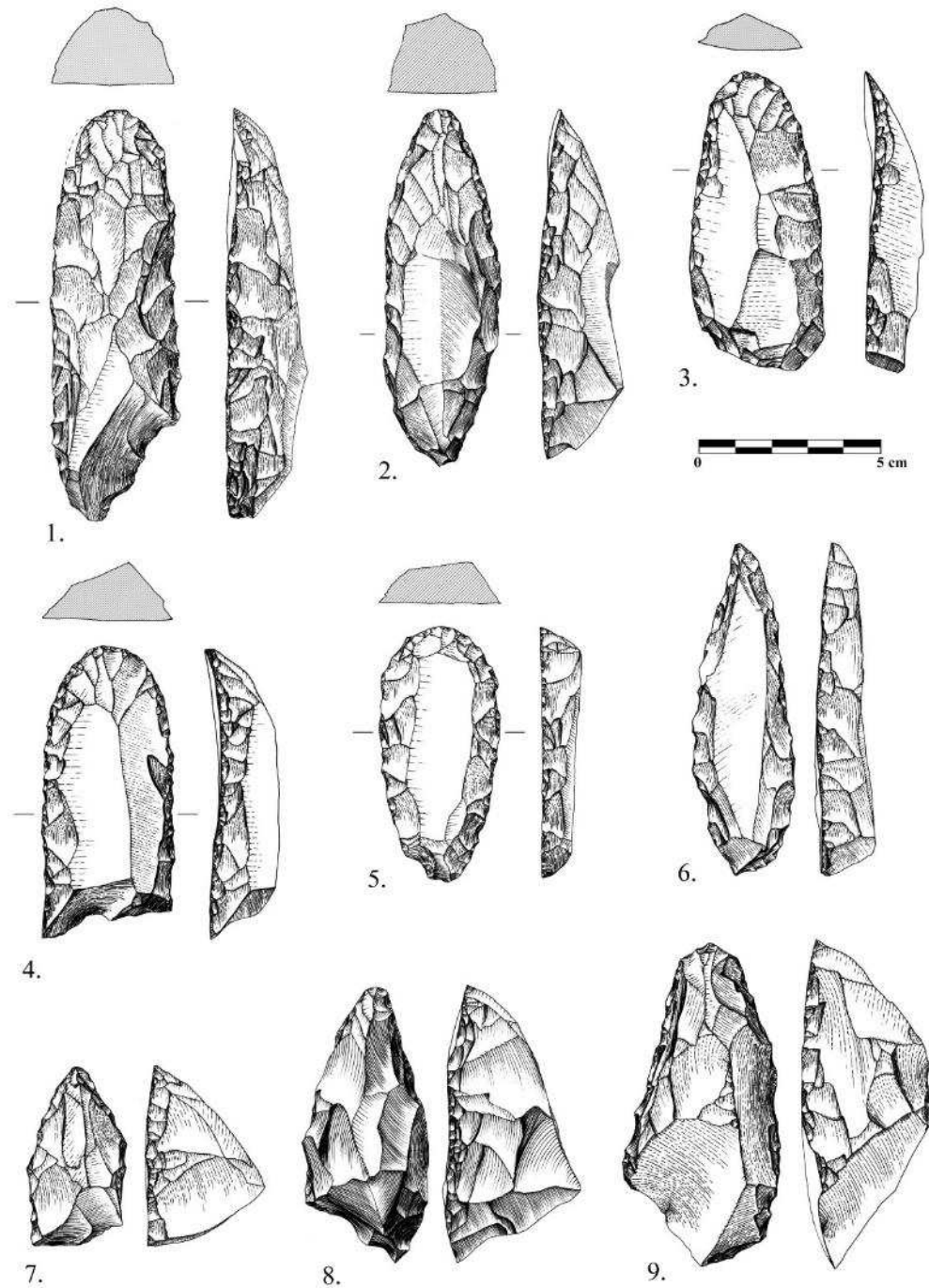


# Unifacially shaped artifacts

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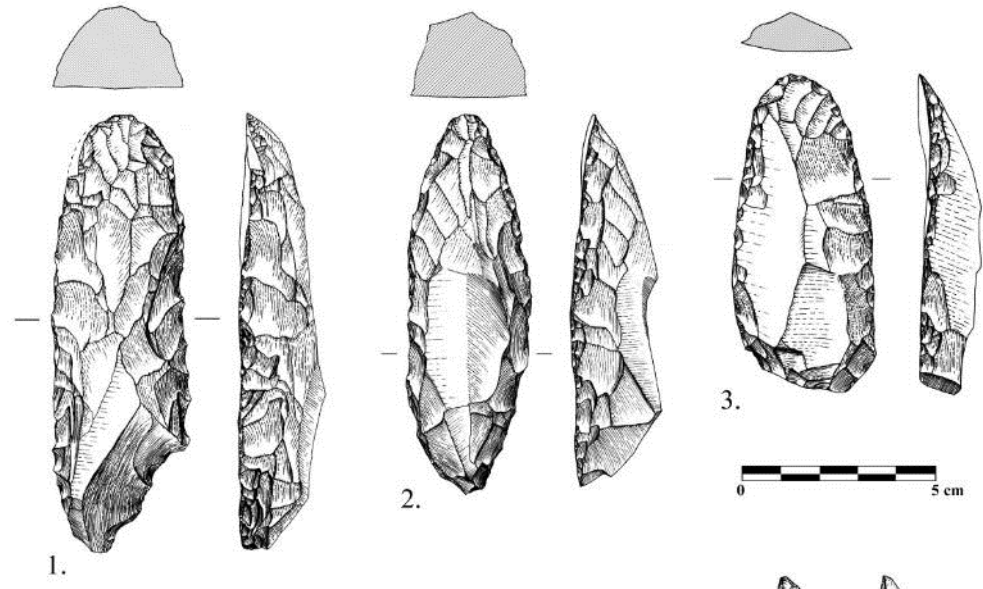
## Variability



# Unifacially shaped artifacts

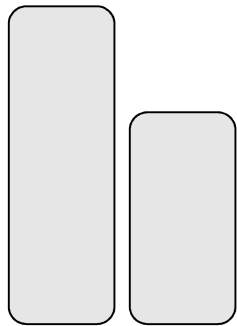
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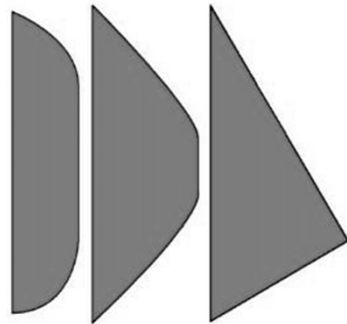


## Variability

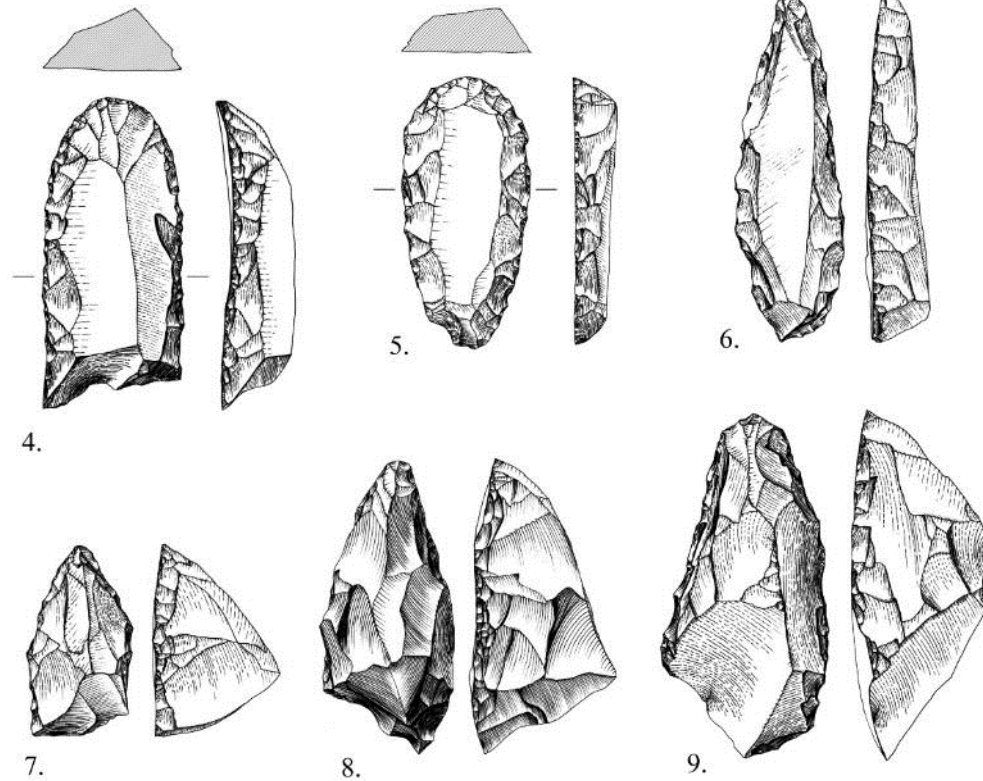
- in the volumes



More or less elongated



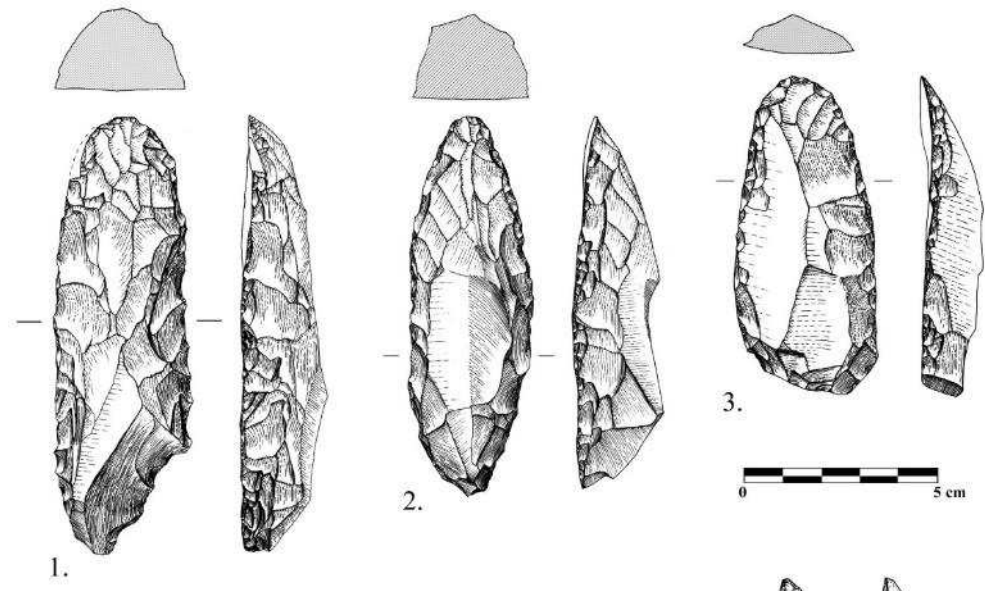
Different profiles



# Unifacially shaped artifacts

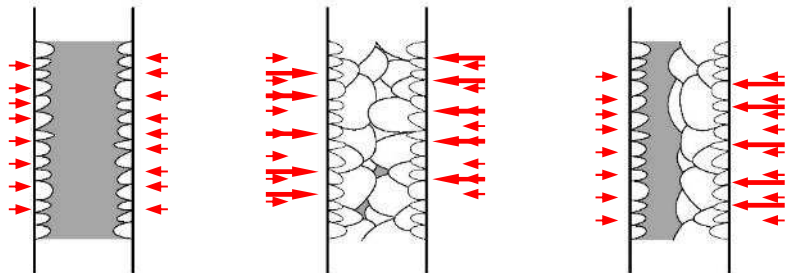
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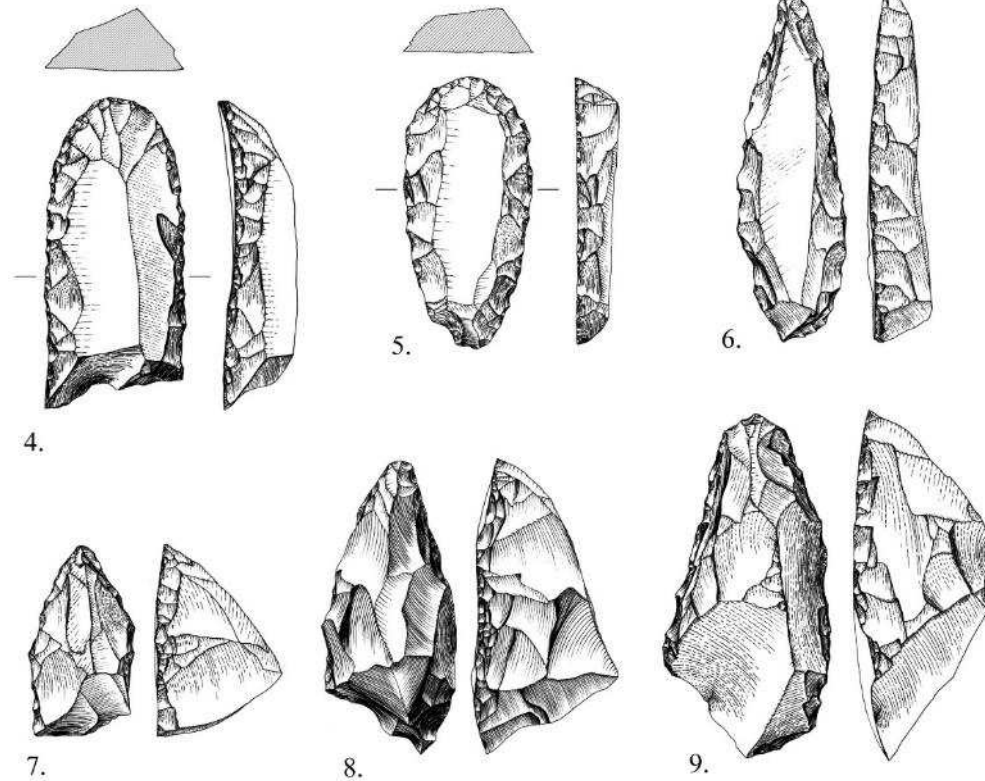


## Variability

- in the production processes



Differences in the unifacial shaping process and intensity

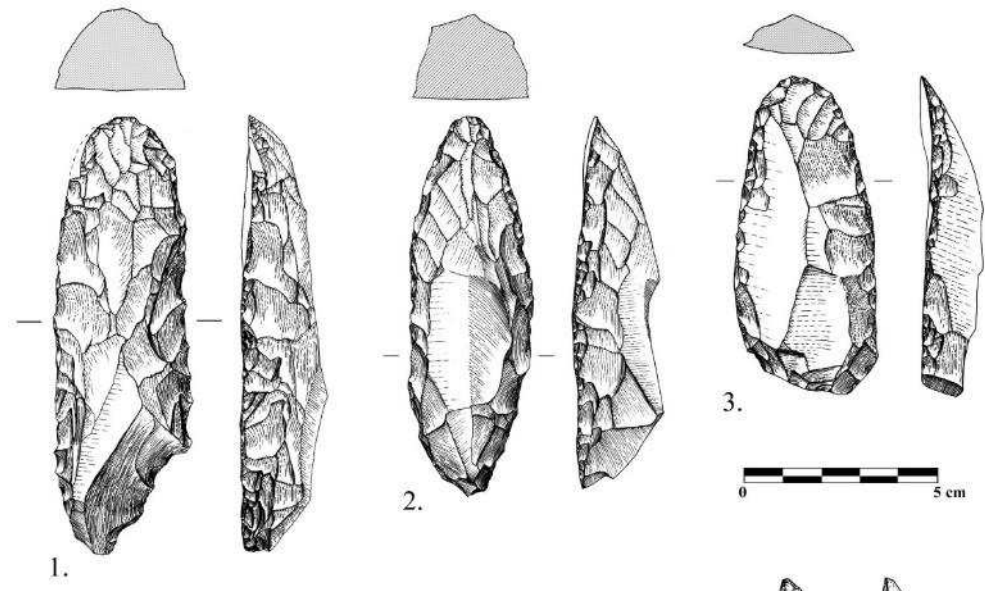




# Unifacially shaped artifacts

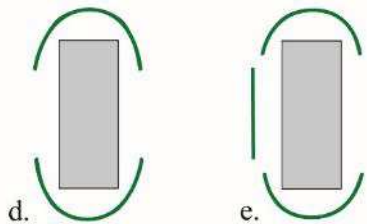
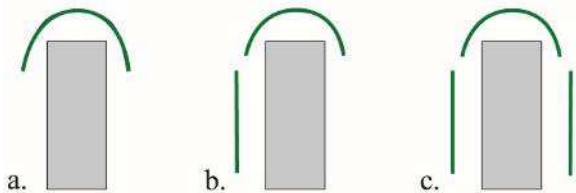
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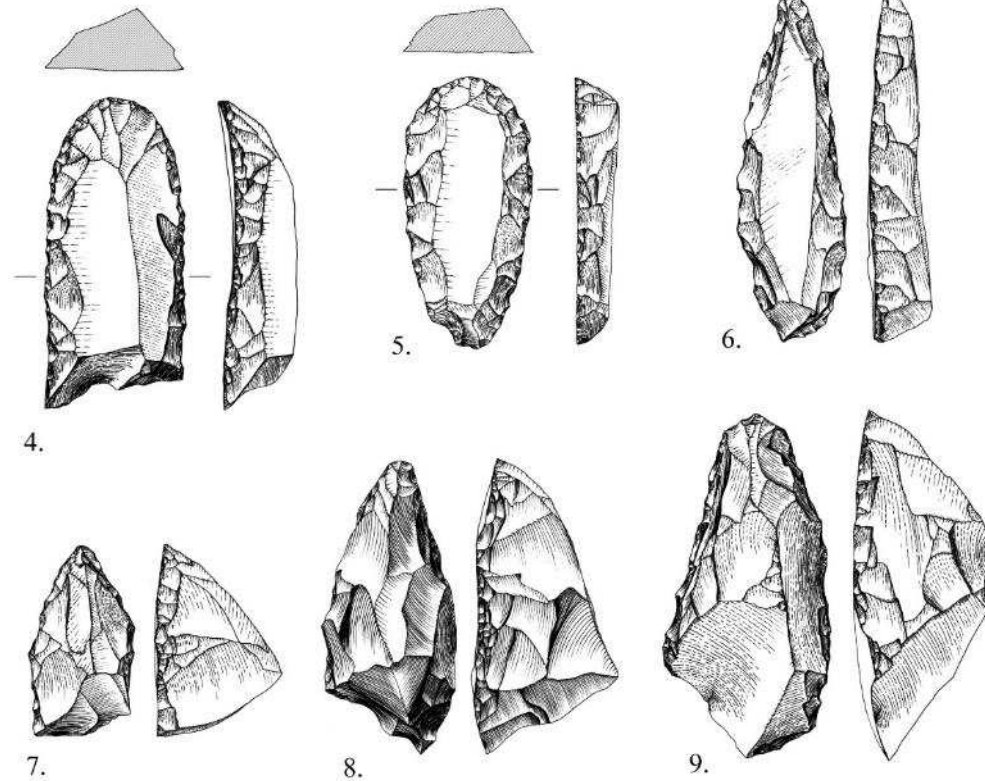


## Variability

- in the functional potentials



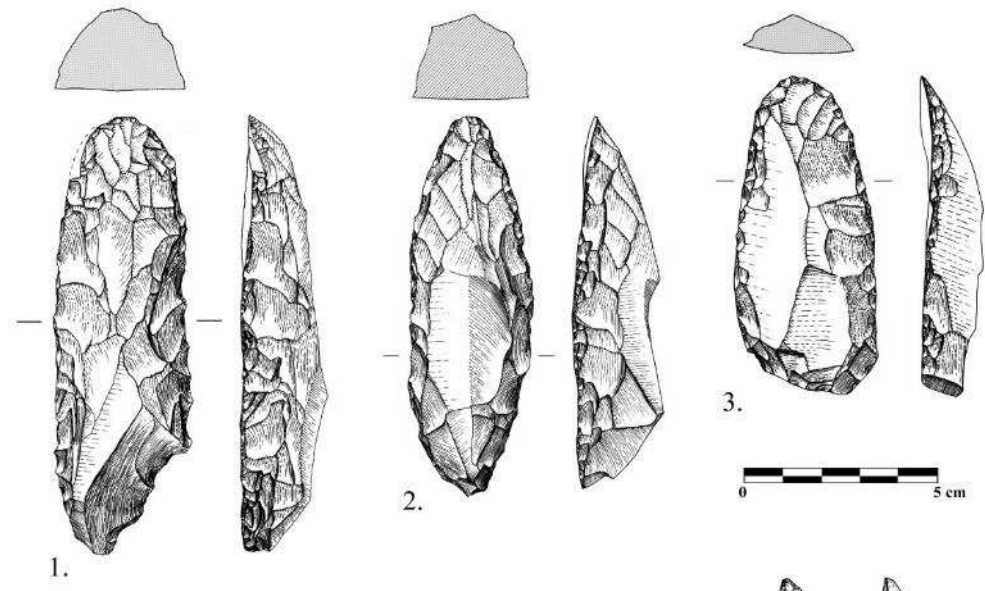
Number, properties and location of the cutting-edges



# Unifacially shaped artifacts

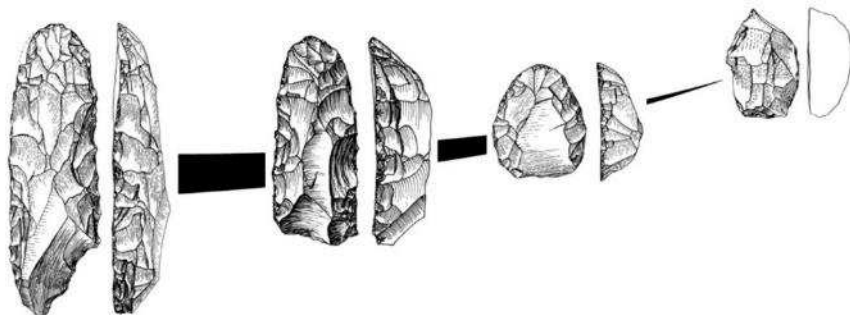
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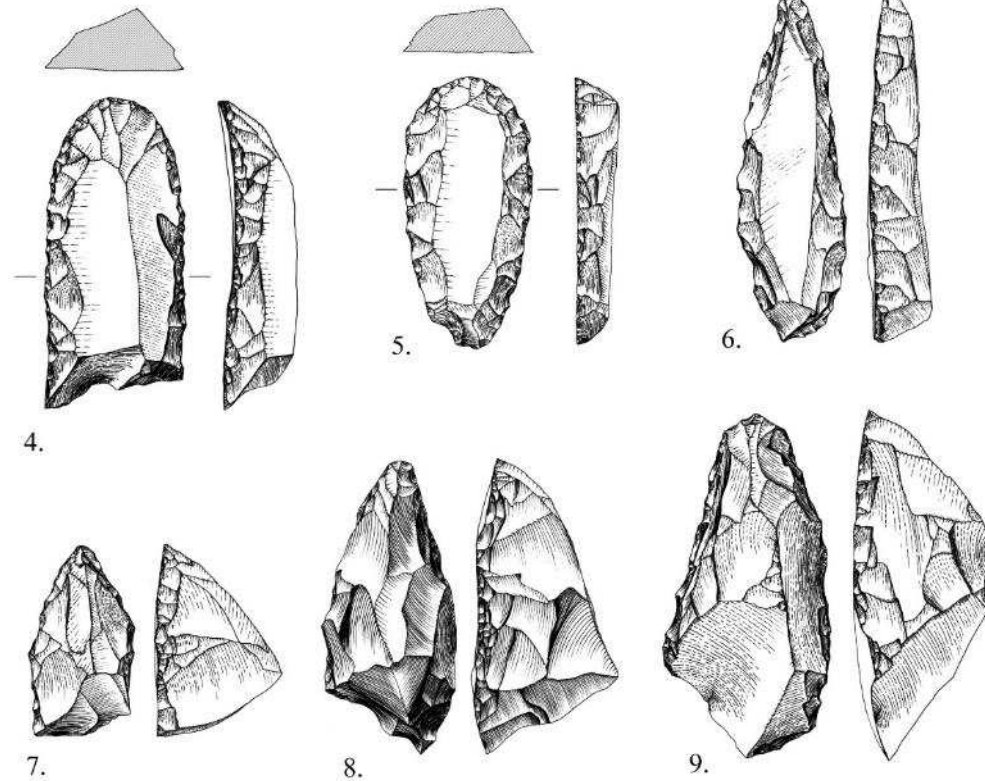


## Variability

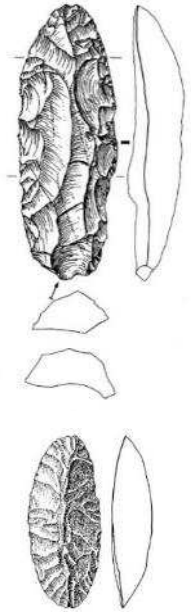
- in the "functional life" duration



Different technical stages of use and reuse

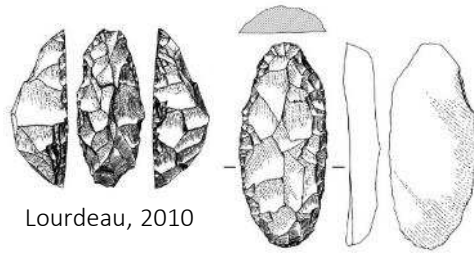


# Unifacially shaped artifacts



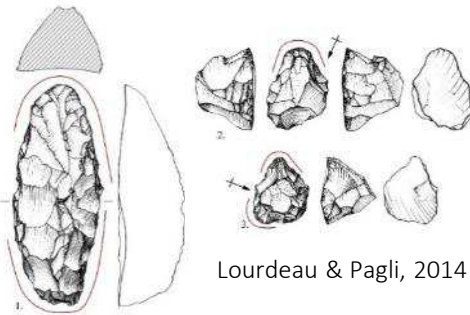
Parenti, 2001

Boqueirão da  
Pedra Furada



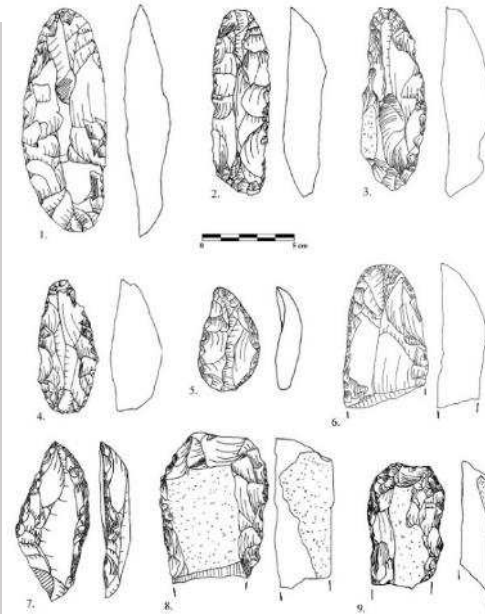
Lourdeau, 2010

Pica-Pau



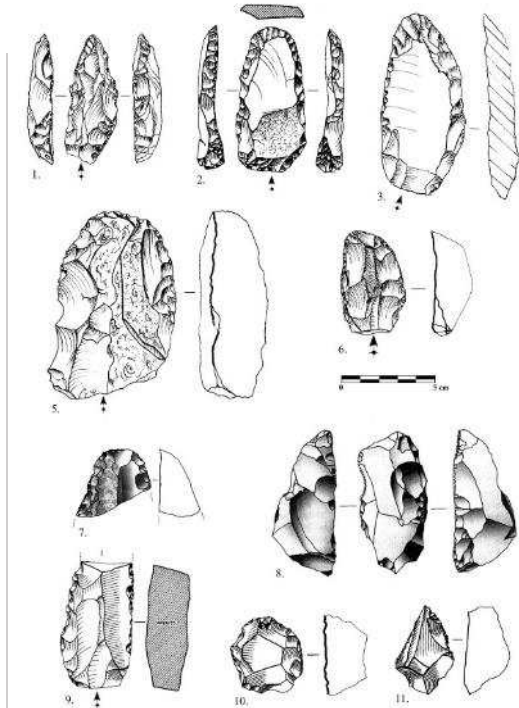
Lourdeau & Pagli, 2014

Baixa das Cabaceiras



Lajeado

Bueno, 2007



Boquete

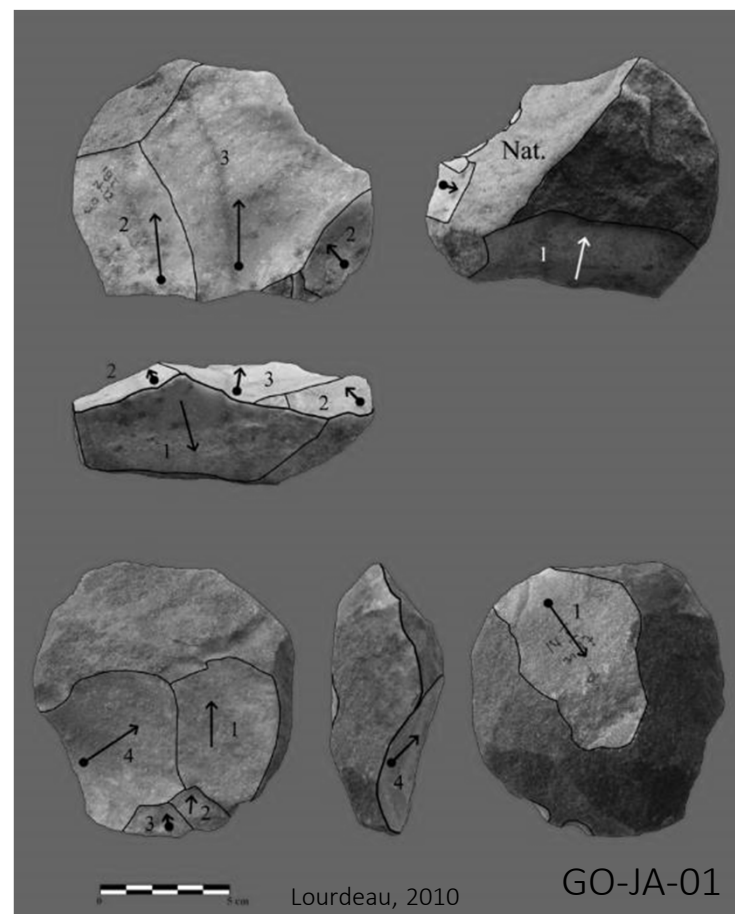
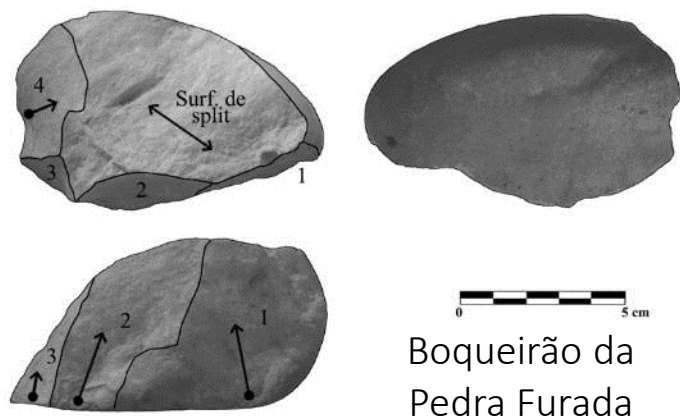
Fogaça, 2001

The same conception in all the archaeological sites of the  
Itaparica technocomplex

# Lithic technology in the Itaparica technocomplex

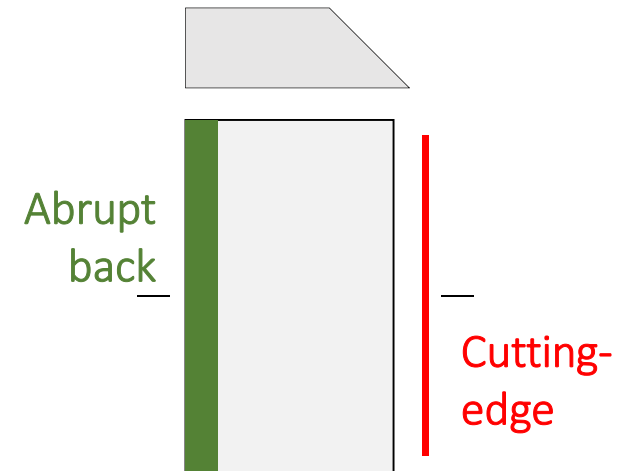
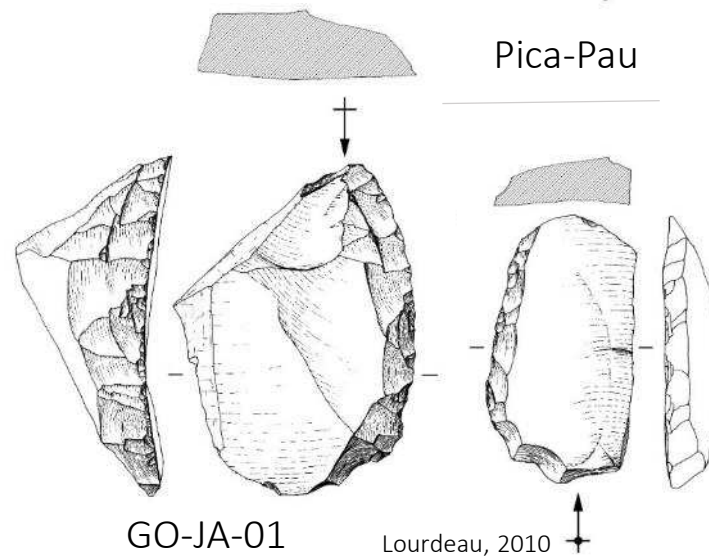
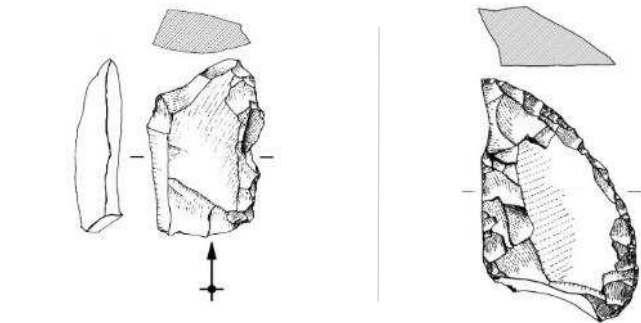
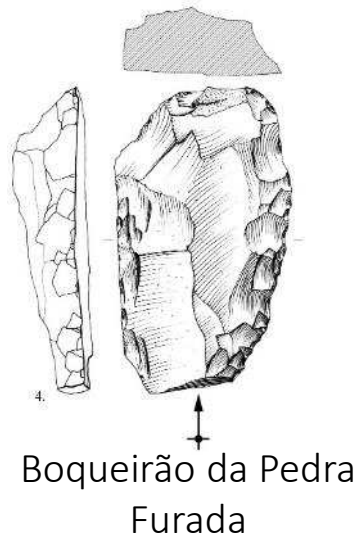
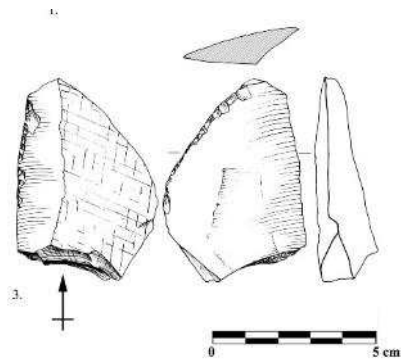
## Flake *débitage*

- unidirectional short series of flakes
- no preparation of the core prior to the *débitage*
- one or more series on the same block



# Lithic technology in the Itaparica technocomplex

## Tools on flakes



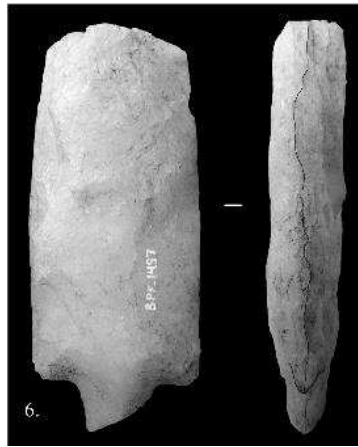
- Variability of the cutting-edges

- But a structural homogeneity:  
 . the cutting on one side,  
 . opposite to an abrupt back on the other side

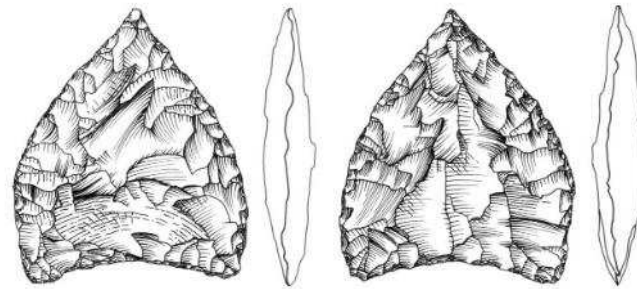
=> Predominance of lateral grasping

# Lithic technology in the Itaparica technocomplex

## Bifacial projectile points



Boqueirão da  
Pedra Furada



Pica-Pau

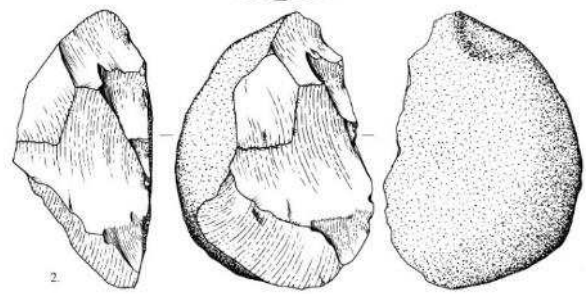
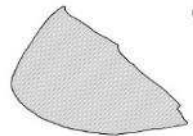
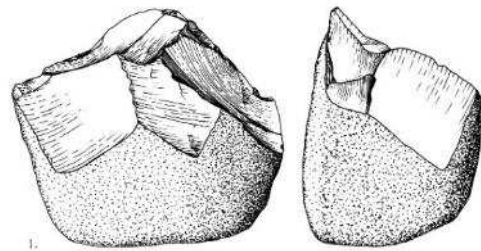
Lourdeau, 2015

Appear very rarely  
=> hunting is not based on the use of lithic points

# Lithic technology in the Itaparica technocomplex

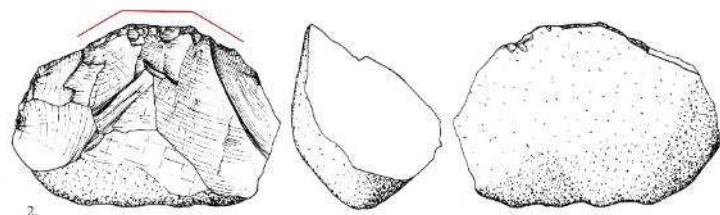
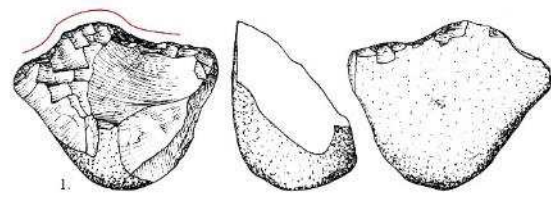
## Some local characteristics

Example: use of pebbles in the Serra da Capivara region

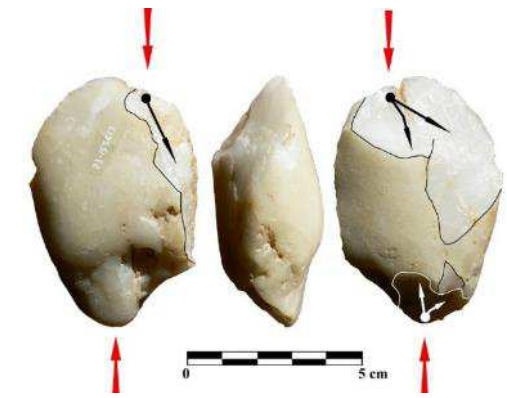


Boqueirão da Pedra Furada

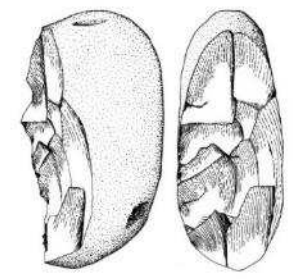
## Tools on pebbles



Baixa das Cabaceiras



Pedra Furada  
Bipolar *débitage*



Pica-Pau





# Means of subsistence associated with this technology

Barbosa's hypothetical model for the Itaparica's ecological management

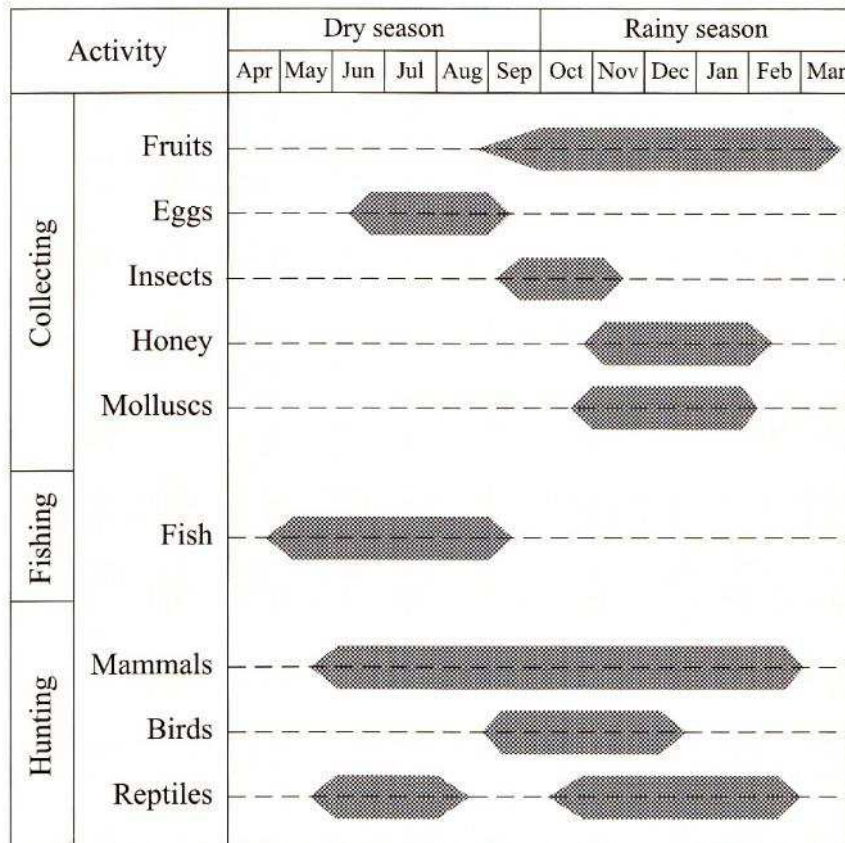


Fig. 135. Diagrammatic representation of annual hunting, fishing, and collecting activities exercised in the cerrado biome by Amerindians. Redrawn and adapted from Barbosa and Schmitz (1998).  
Gottsberger, 2006

Collecting:

Fruit collection more intensive during the rainy season.

Other resources: bird eggs during the second part of the dry season, larval stages of several insects, principally at the beginning of the rainy season; honey collection during the rainy season.

Hunting:

Mammals hunted throughout the year.

Bird hunting principally during the first half of the rainy season.

Small reptiles could be caught more easily during the rainy season, while the bigger ones, such as turtles or caimans, could be hunted more easily during dry season.

Fishing: principally during the dry season, because water volume is smaller at this time.

=> diverse food resources available at different times throughout the year.

## Itaparica technocomplex



- Corresponds to the first conspicuous settlement of Central Brazil (14.000 to 9.000 BP)
- Characterized by a specific lithic technology
- Its spatial distribution is included in the current extension of the *Cerrado*

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Can we really say that?

## Itaparica technocomplex adapted to the *Cerrado* ?

Yes, but not only...

Yes, of course, every society is adapted to his environment

But, how did humans living in Central Brazil adapt themselves to their environment? What were the solutions that human groups found to deal with the environment they are living in?

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But, how did humans living in Central Brazil adapt themselves to their environment? What were the solutions that human groups found to deal with the environment they are living in?

In what sense can we say that the unifacially shaped artefacts are adapted to the *Cerrado*? We don't even know their function...

One cannot forget that the Itaparica technocomplex is a cultural choice, among much other possible options (for example in São Paulo State).



Mere “adapalist” views, even for prehistoric hunter and gatherer groups, are not satisfactory to understand the human/environment relationship network and peopling processes.

Cultural approaches, searching for the local ways how societies live in a determined landscape, are essential.

The way to live in a given place is a matter of aware or unaware choices.

# PREHISTORY OF HUMAN SOCIETIES IN THE *CERRADO* (CENTRAL BRAZIL) *The first settlements*

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