

# Antropologie obecná I

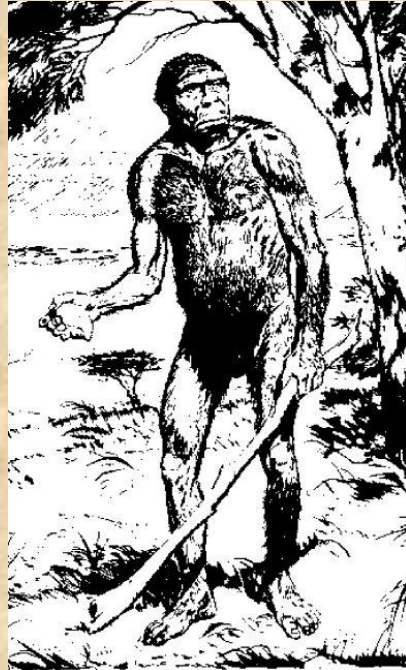
## Předci hominidů



**Doc. Václav Vančata**

*Antropologický ústav Př F MU*

# Lineární pojetí evoluce hominidů



# Nadčeled' *Hominoidea*

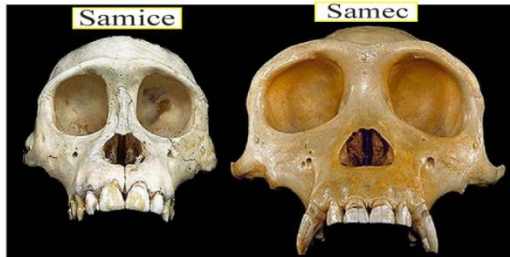


# Velcí lidoopi – jediní opravdoví příbuzní

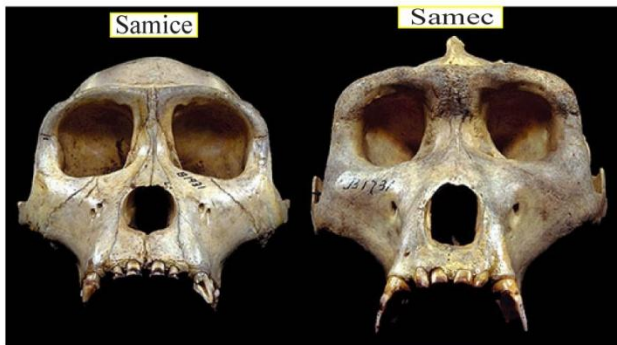


# Čeled' *Hominidae* - velcí lidoopi

Šimpanz



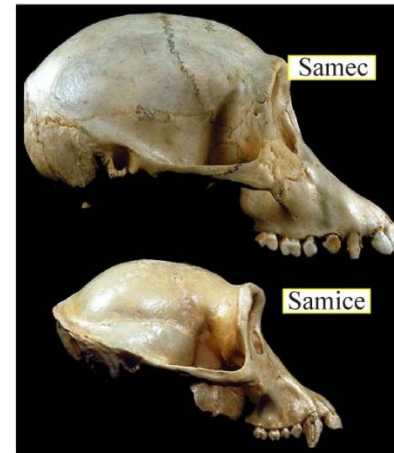
Gorila



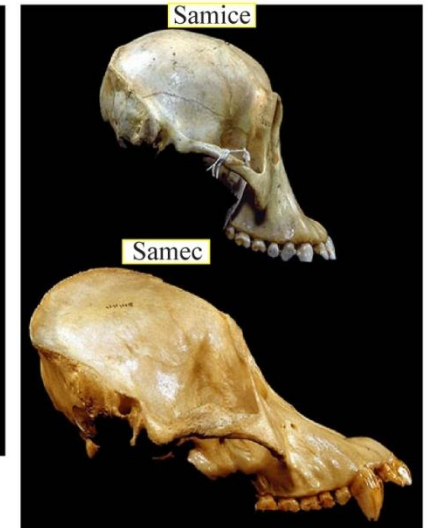
Orangutan



Šimpanz



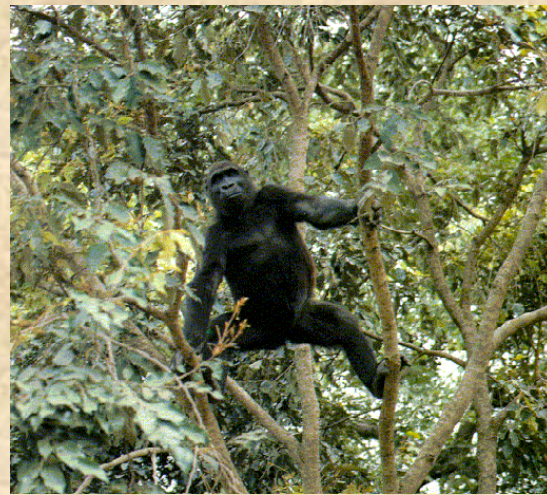
Orangutan



Gorila



# Skelet velkých lidoopů

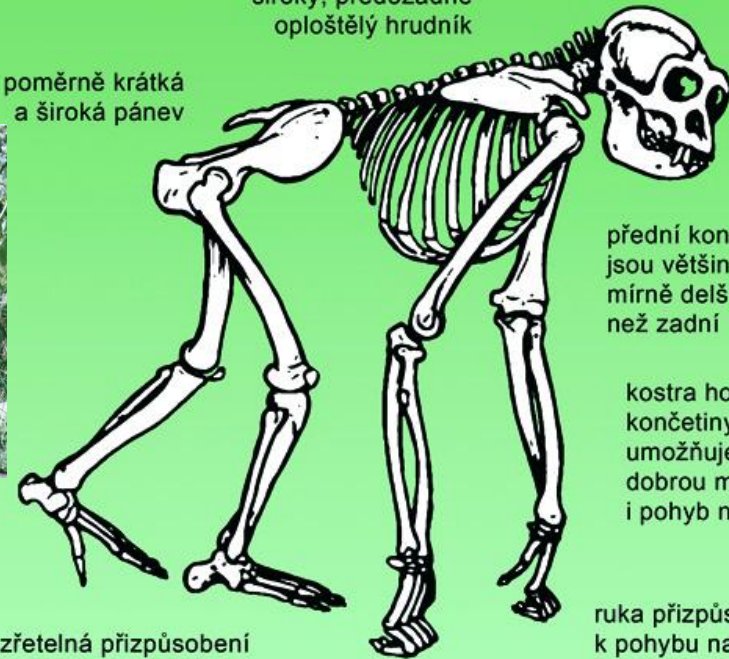


poměrně vysoká  
hmotnost: 40- 50 kg

hominidní stavba lebky

široký, předozadně  
oploštělý hrudník

poměrně krátká  
a široká pánev



přední končetiny  
jsou většinou  
mírně delší  
než zadní

kostra horní  
končetiny  
umožňuje velmi  
dobrou manipulaci  
i pohyb na stromech

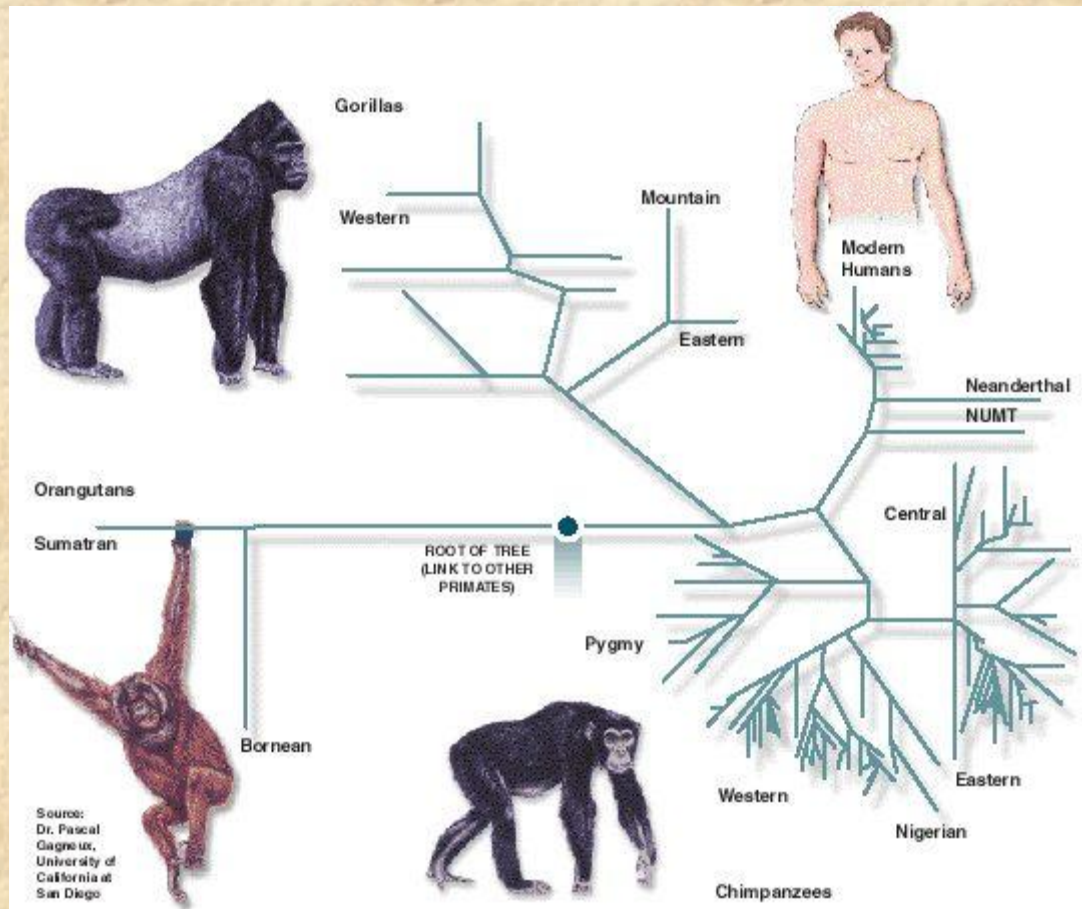
noha má zřetelná přizpůsobení  
k pohybu na zemi

ruka přizpůsobená  
k pohybu na zemi  
i na stromech



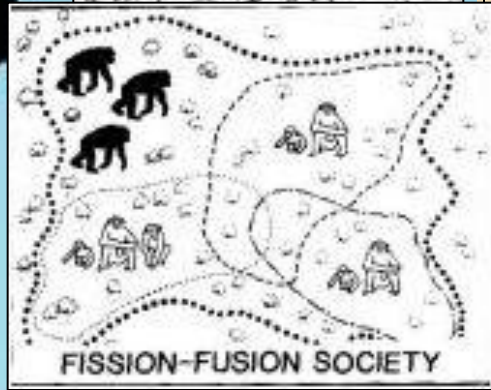
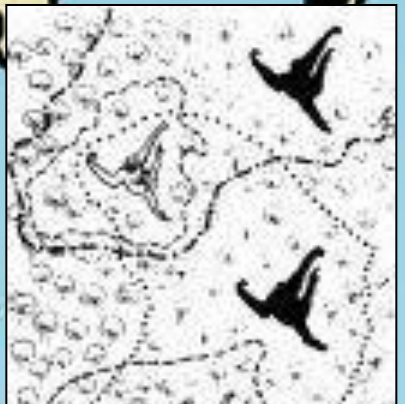
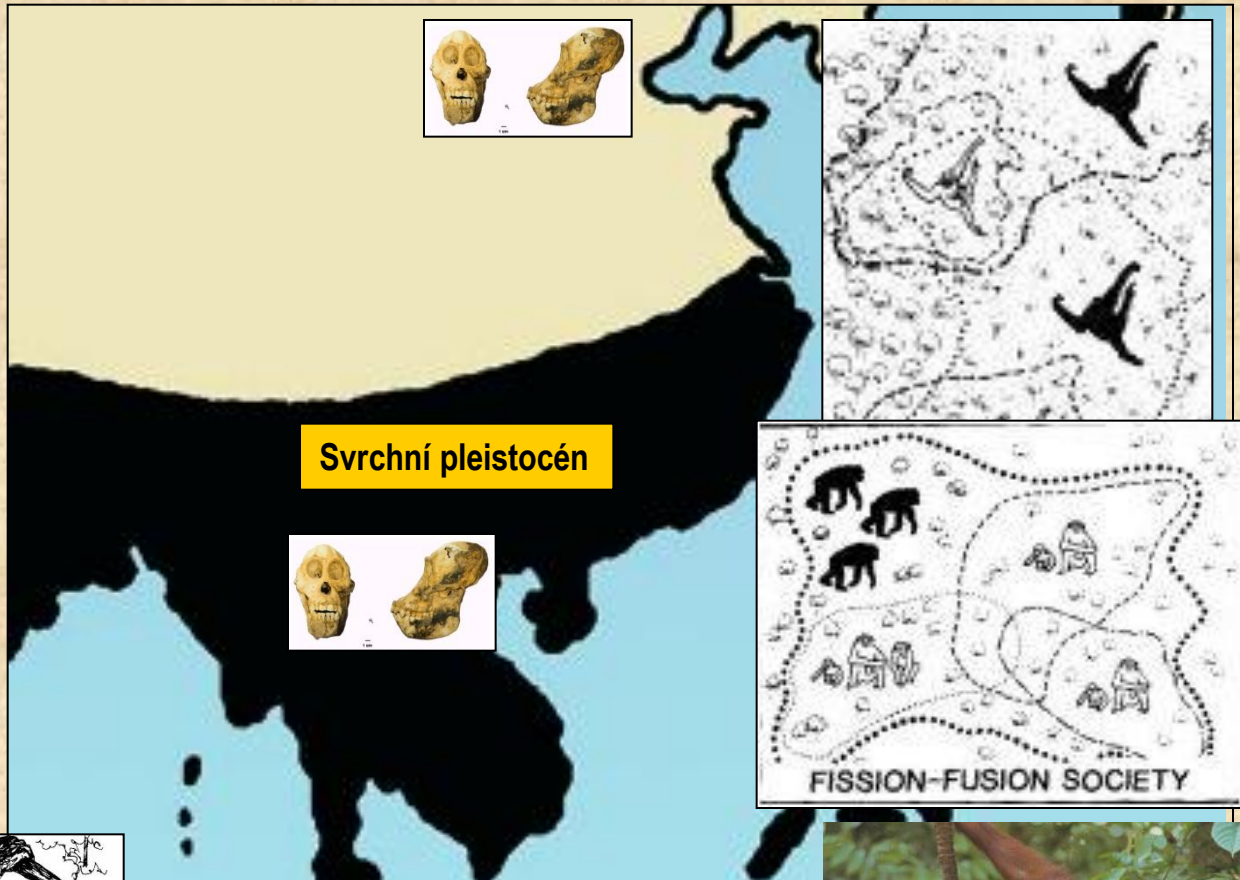
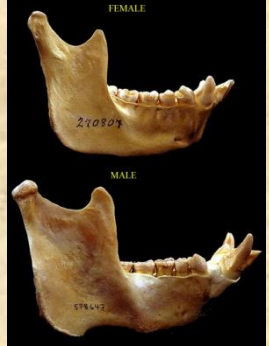
# Genetika hominidů

Všichni velcí lidoopi mají stejný počet 48 chromozomů

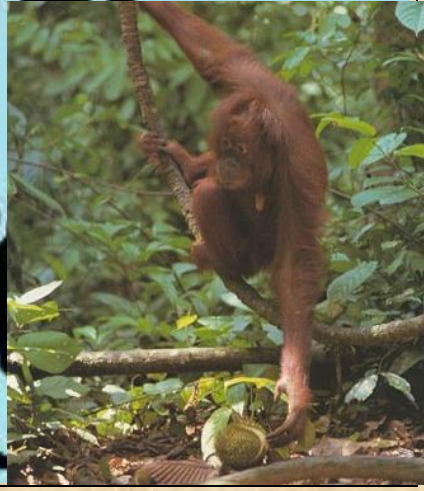
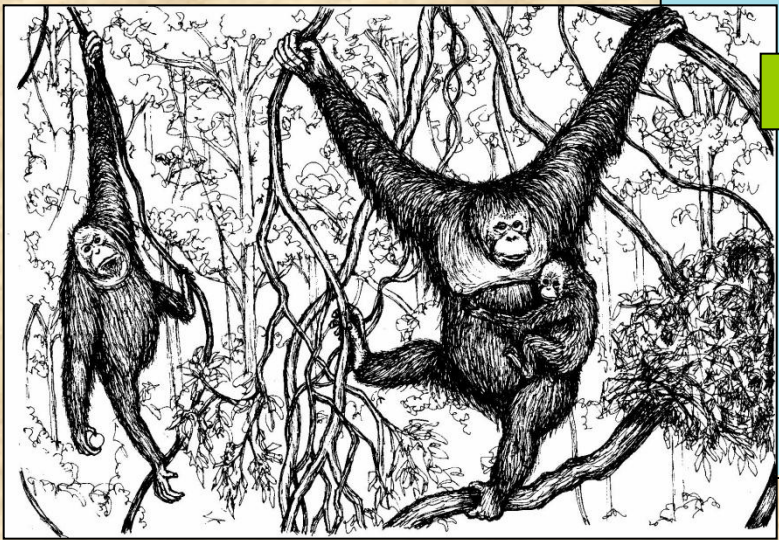




Rod  
orangutan  
*Pongo*

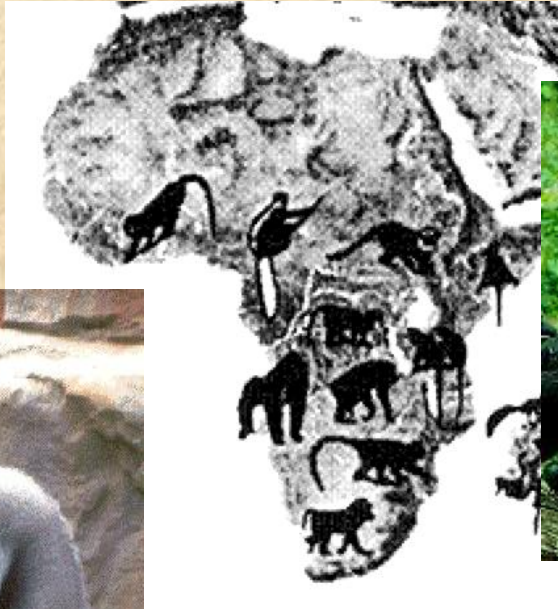


Orangutan sundský - *Pongo pygmaeus*





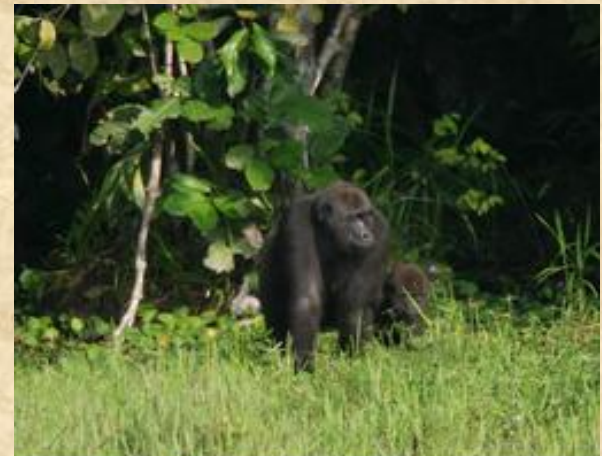
# Gorily a šimpanzi – nejstarší nález pouhých 535 000 let



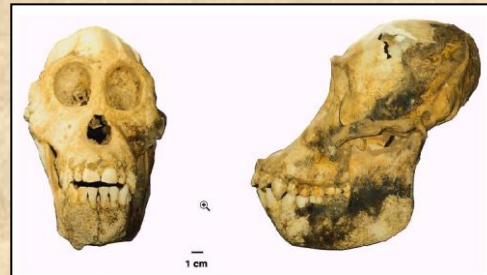
Frans de Waal, Frans Lanting  
Bonobo: The Forgotten Ape  
(University of California Press 1997).



# Nástrojové chování goril

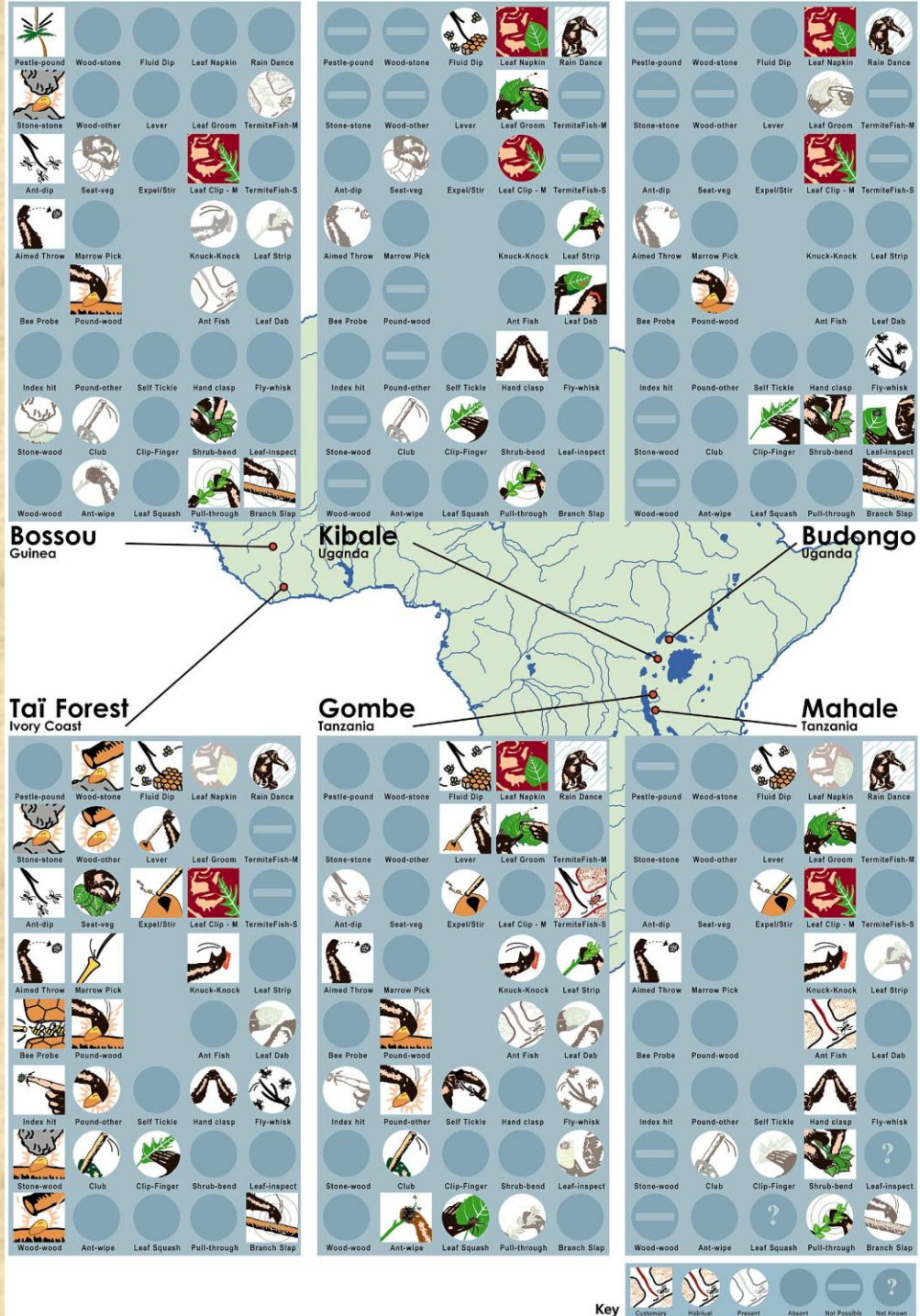


# Orangutani – nástroje, voda a lov ryb



# Pan troglodytes

## nástrojové chování, tradice a lov



# Fongoli savanna Senegal

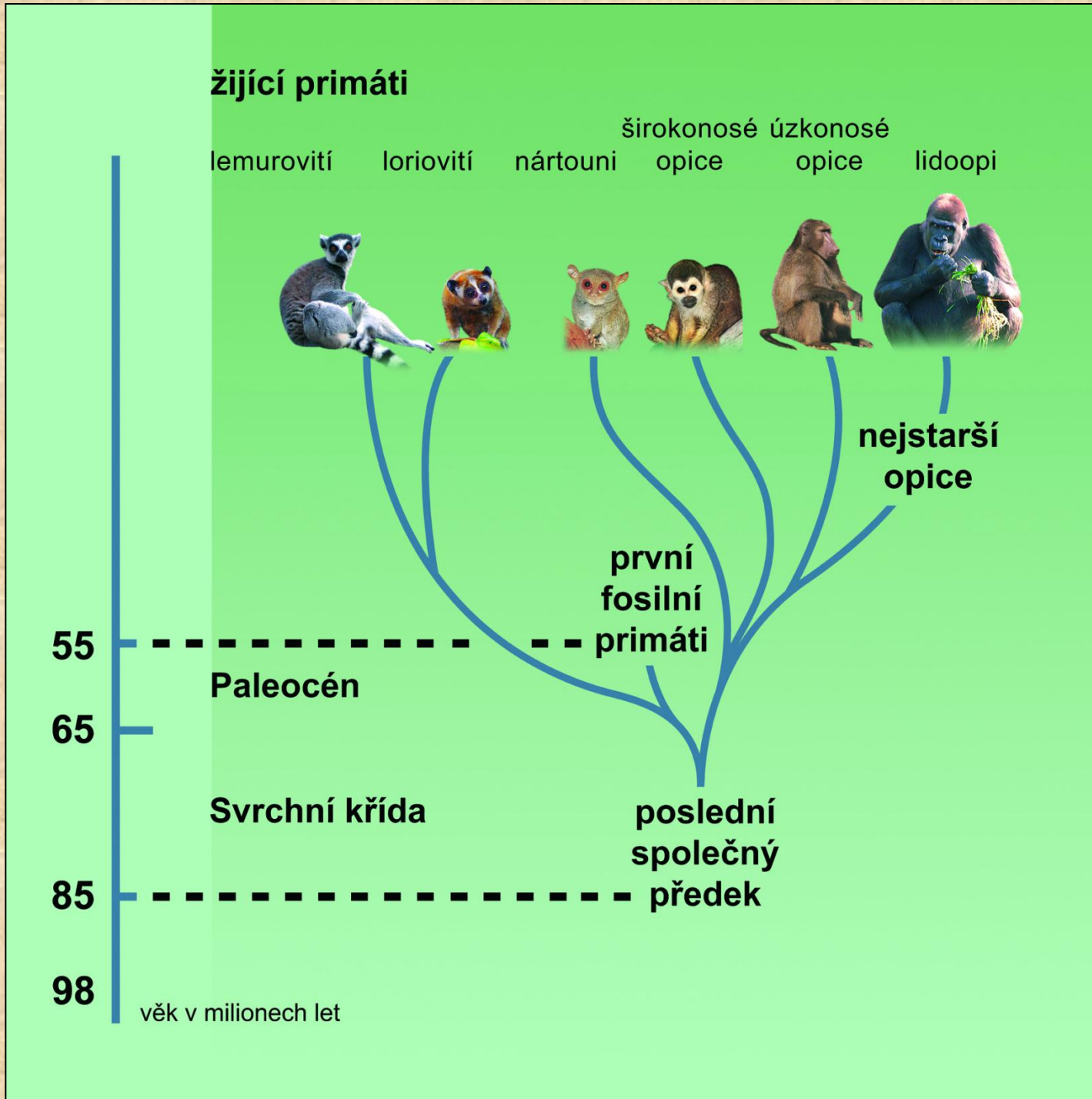


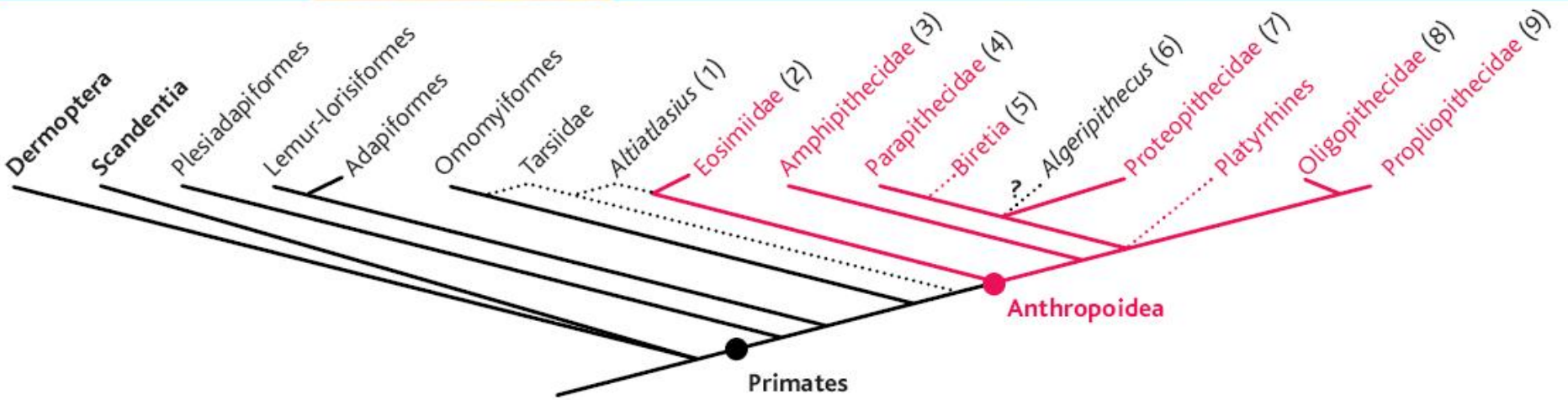
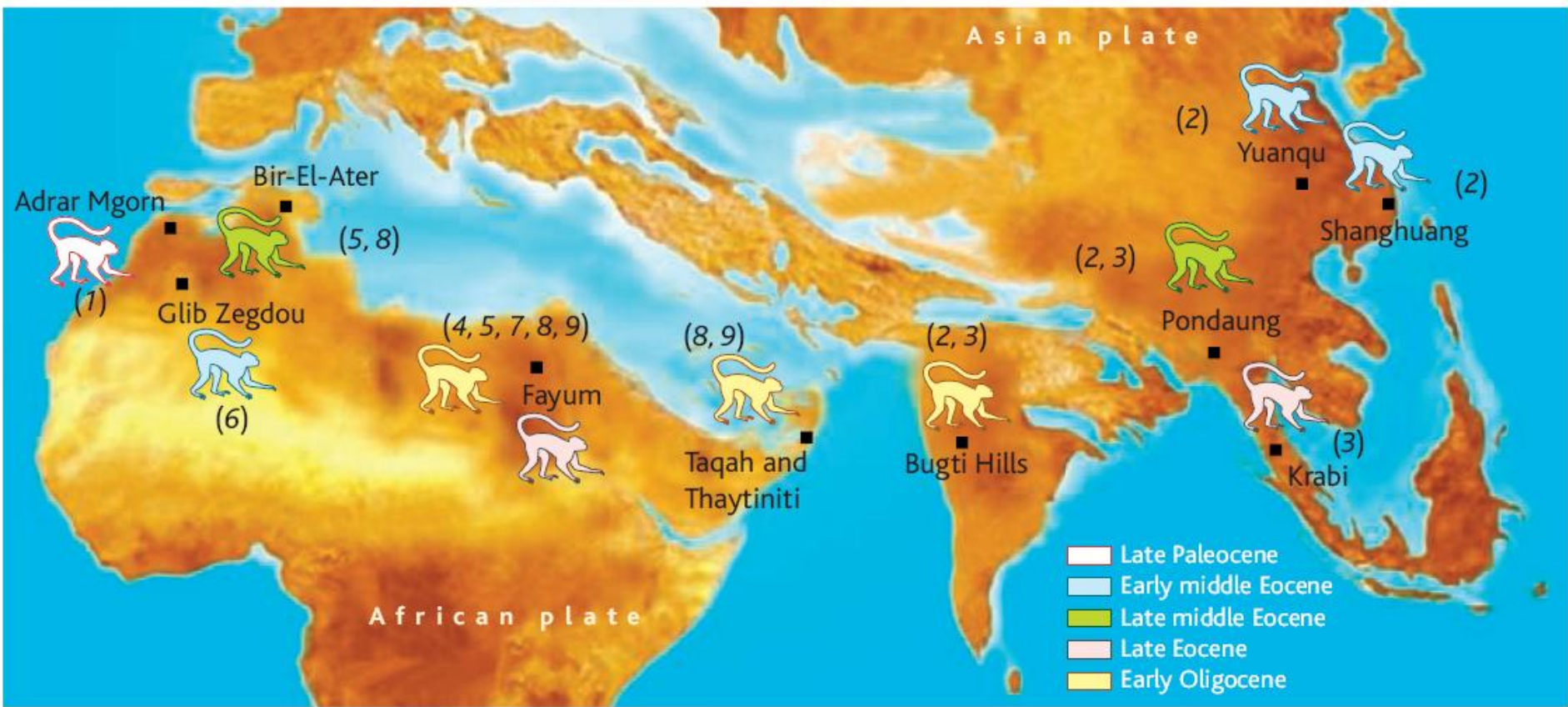
# Fongoli savanna Senegal



- Šimpanzi loví podle podmínek různou kořist
- Používají sady nástrojů a mohou jimi i lovit – totéž i orangutani sumaterští
- Mají velmi složité chování – klamou a manipulují
- Nebojí se vody ani ohně
- V případě nutnosti mohou obývat i jeskyně
- Mohou řešit i velmi složité úlohy a sociální situace, komunikují, ale problém vždy řeší přísně pragmaticky

# Teorie paralelního vývoje poloopic a vyšších primátů v třetihorách

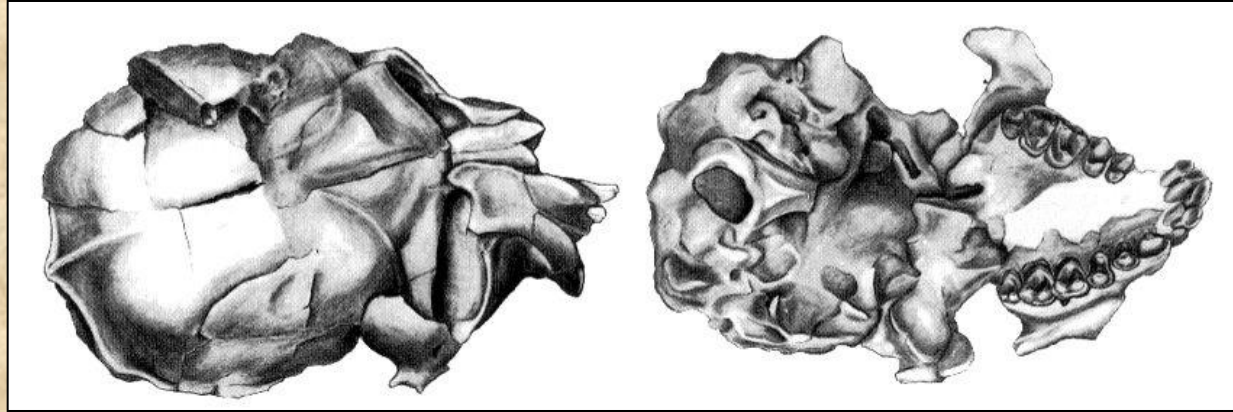




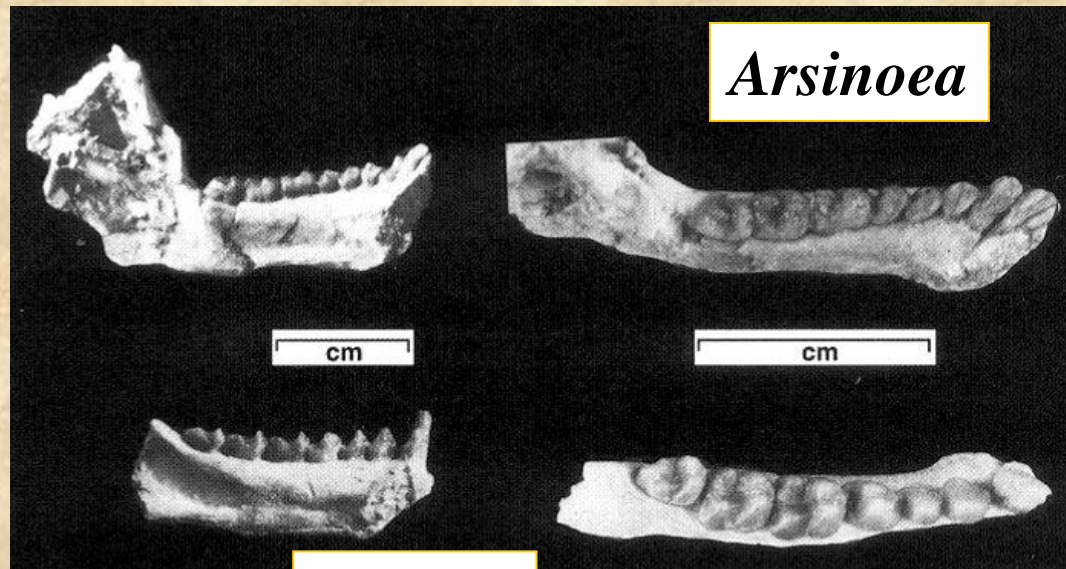
Early anthropoids. (Top) Paleogeographic reconstruction of South Asia and North Africa at the mid-Paleogene showing the



# Eocénní *Anthropoidea* - Fayum



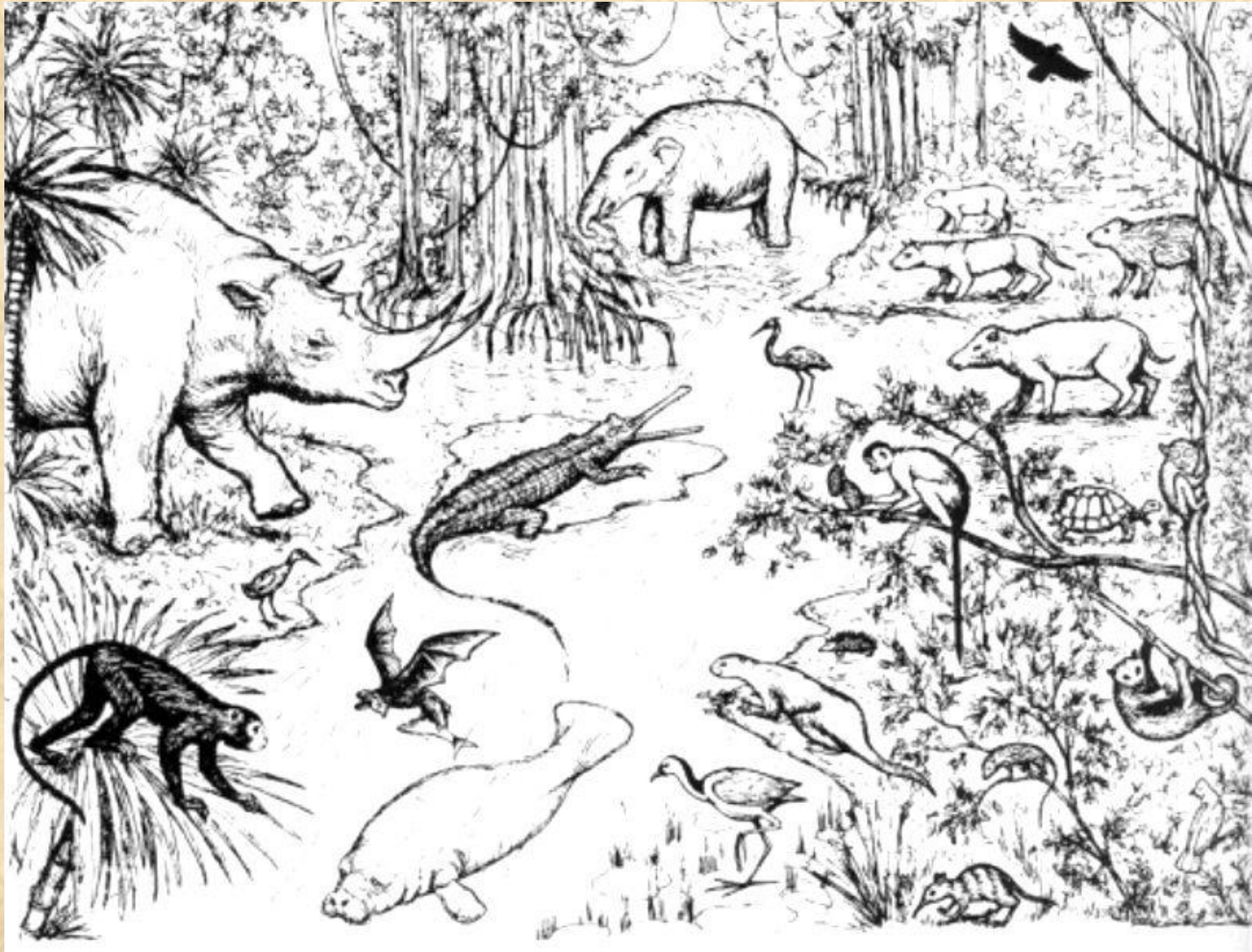
*Catopithecus*



*Arsinoea*

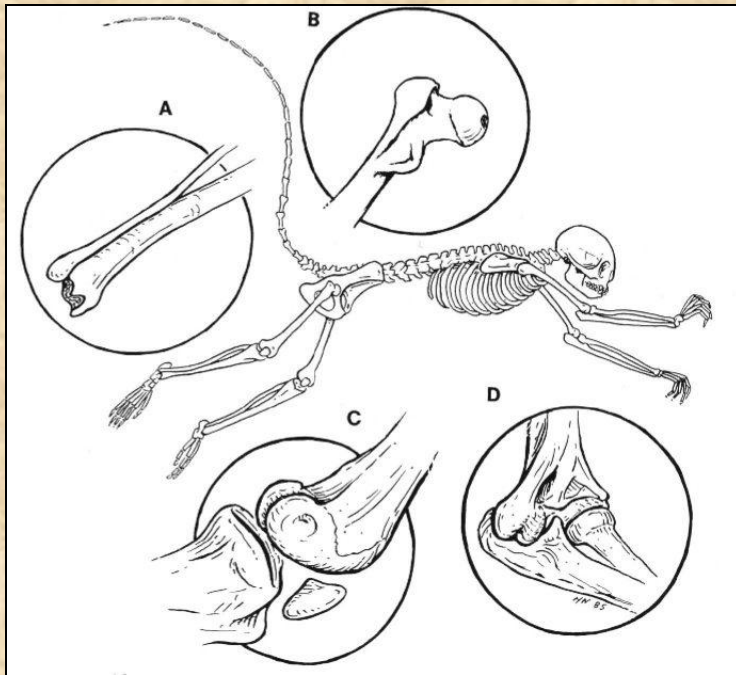
*Serapia*

# Oligocénní *Anthropoidea* - Fayum



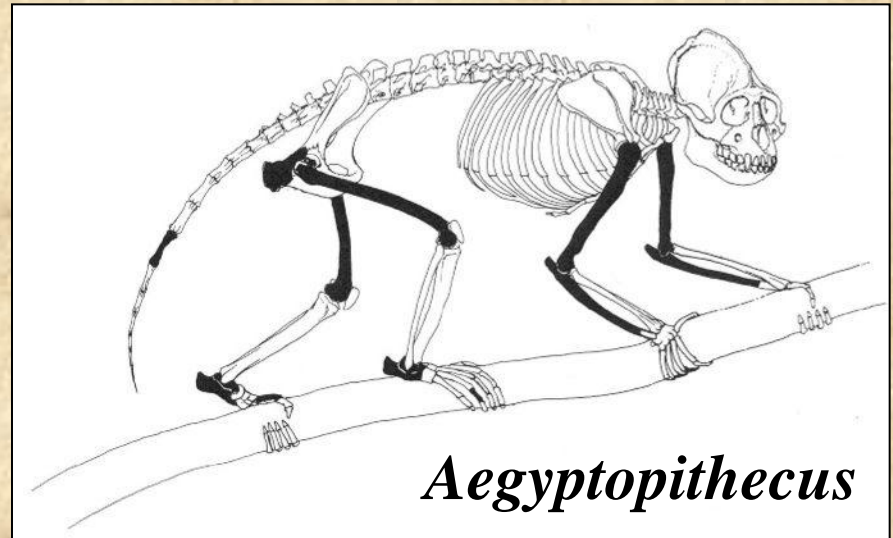
# Adapidae a první zástupci nadčeledi Hominoidea

## Parapithecoidea čeleď Parapithecidae

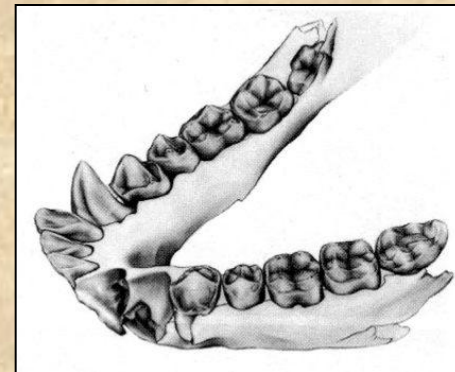


*Apidium*

## Hominoidea čeleď Propliopithecidae

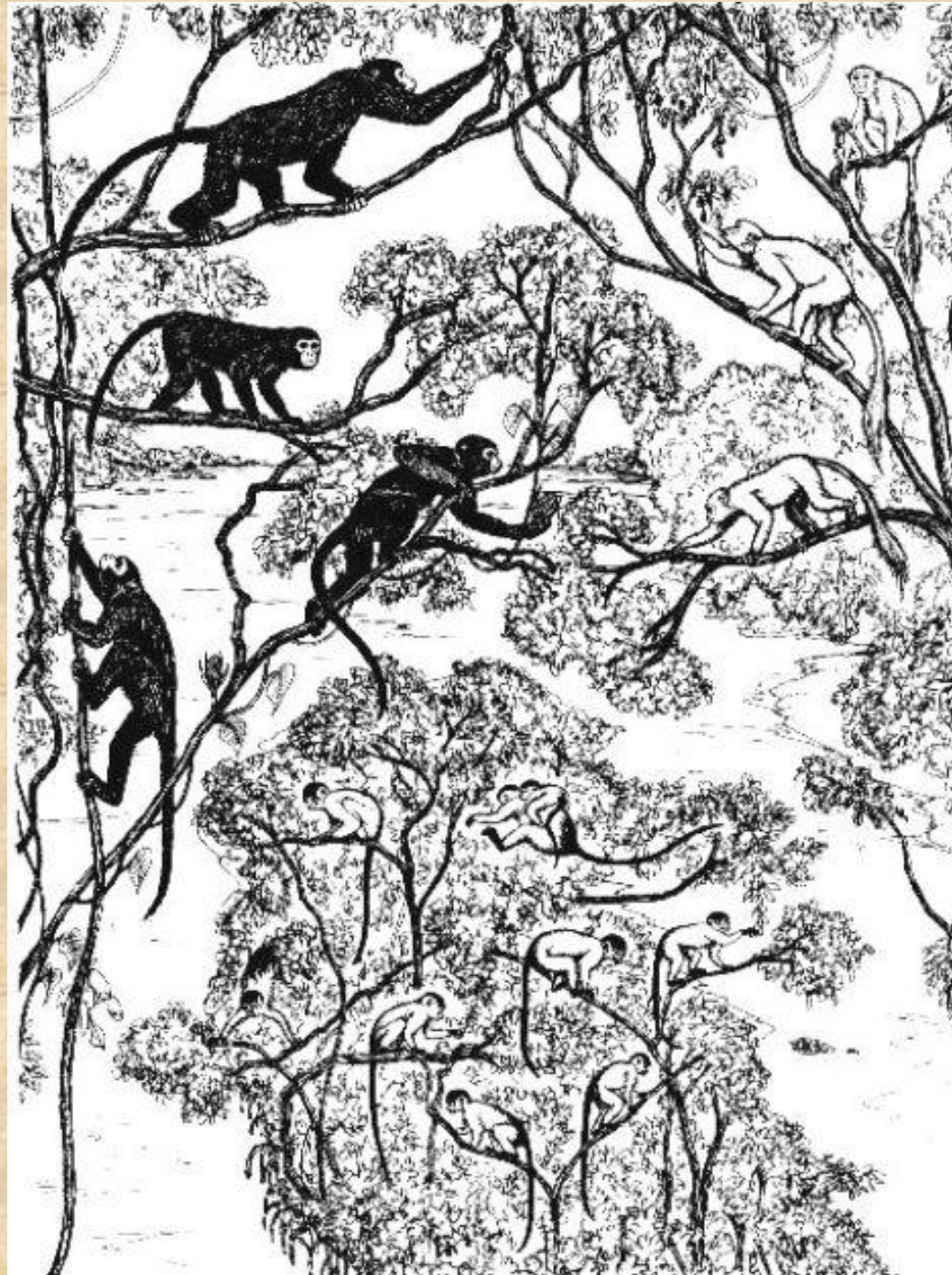


*Aegyptopithecus*



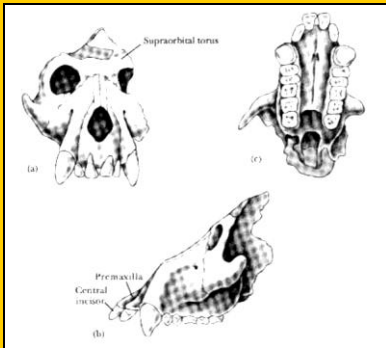
*Propliopithecus*

*Hominoidea*  
ve  
středním  
oligocénu

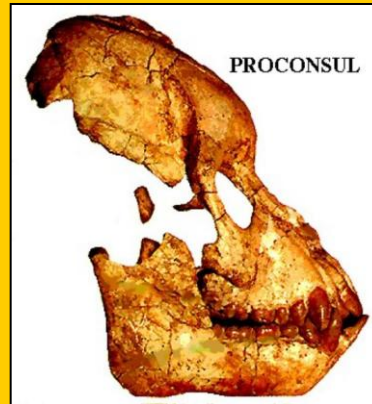
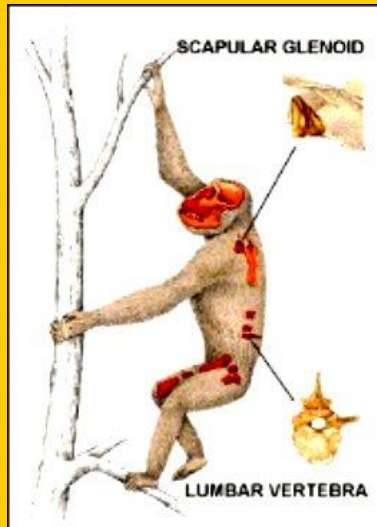


# Adaptivní radiace hominoidů na konci oligocénu: Vznik lidoopů a opic

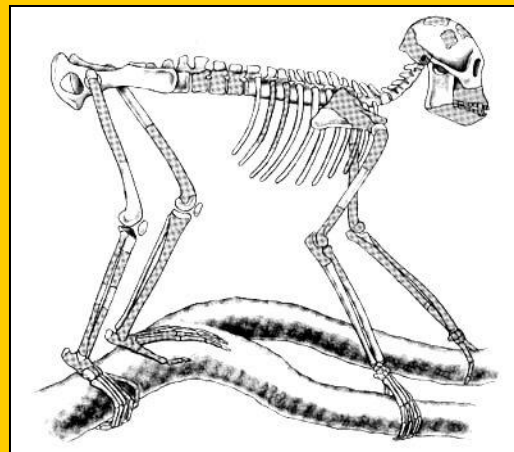
## *Hominidea*



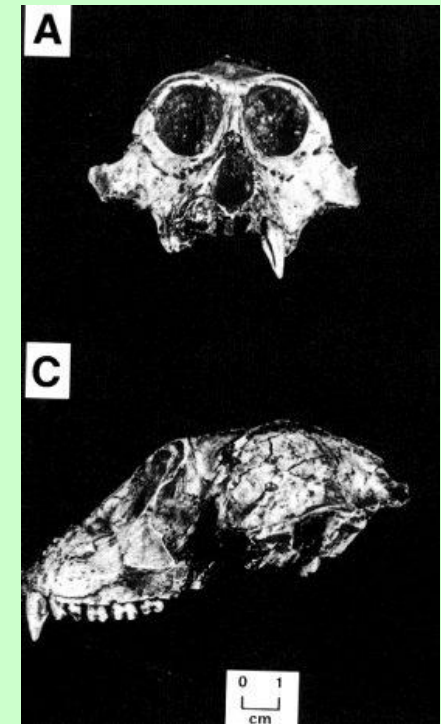
### *Afropithecidae*



### *Proconsuloidea*



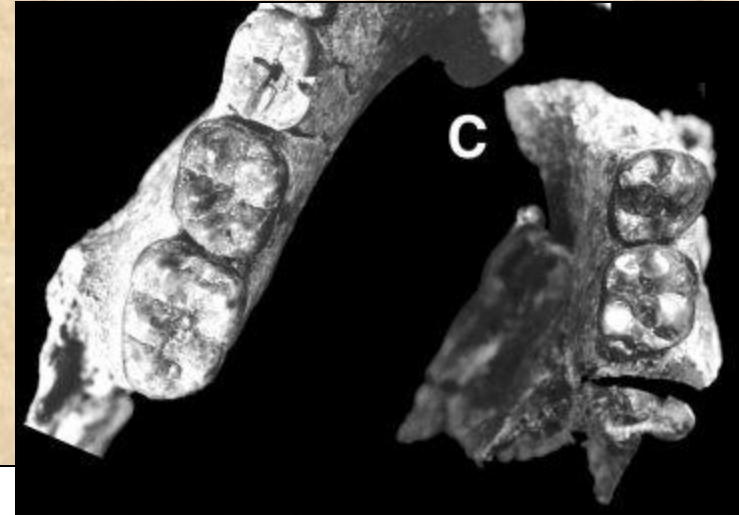
## *Cercopithecoidea*



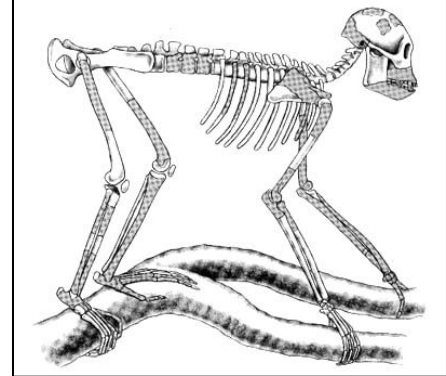
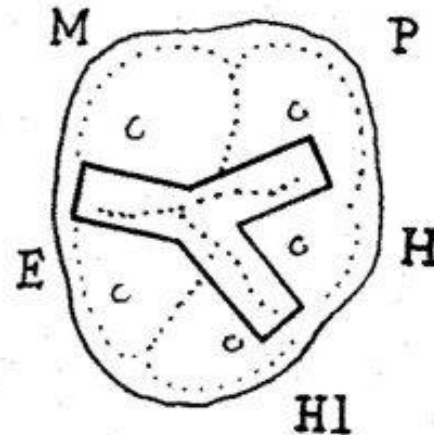
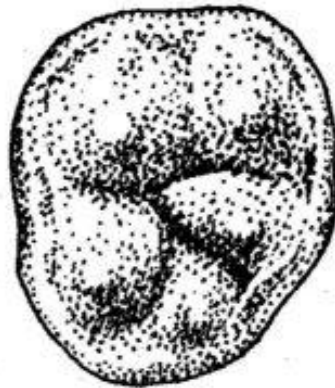
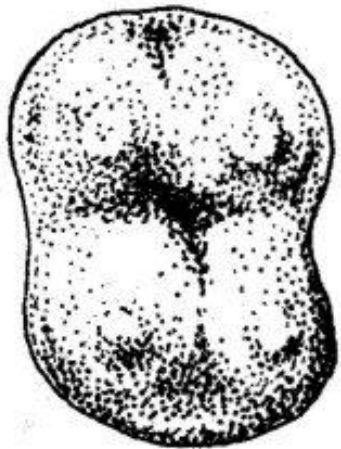
### *Viktoriapithecidae* Ocasatí úzkonosí primáti - praopice

# Dryopitékový Y-vzor

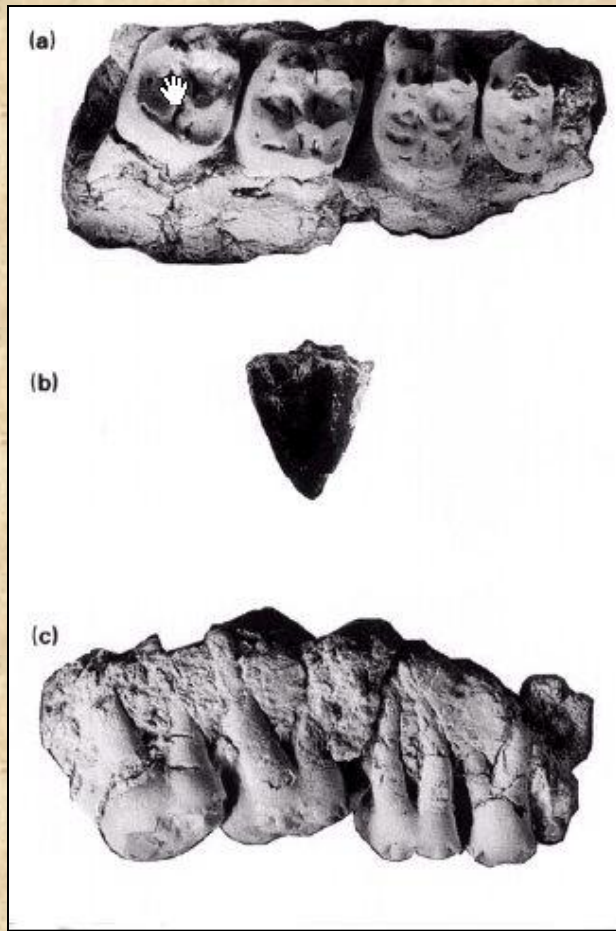
Pro nadčeleď *Hominoidea* jsou typické pětihrbolkové dolní moláry, s takzvaným dryopitékovým vzorem. Dryopitékový vzor se objevuje poprvé propliopitéků. V definitivní podobě však až u bezocasých hominoidů koncem oligocénu.



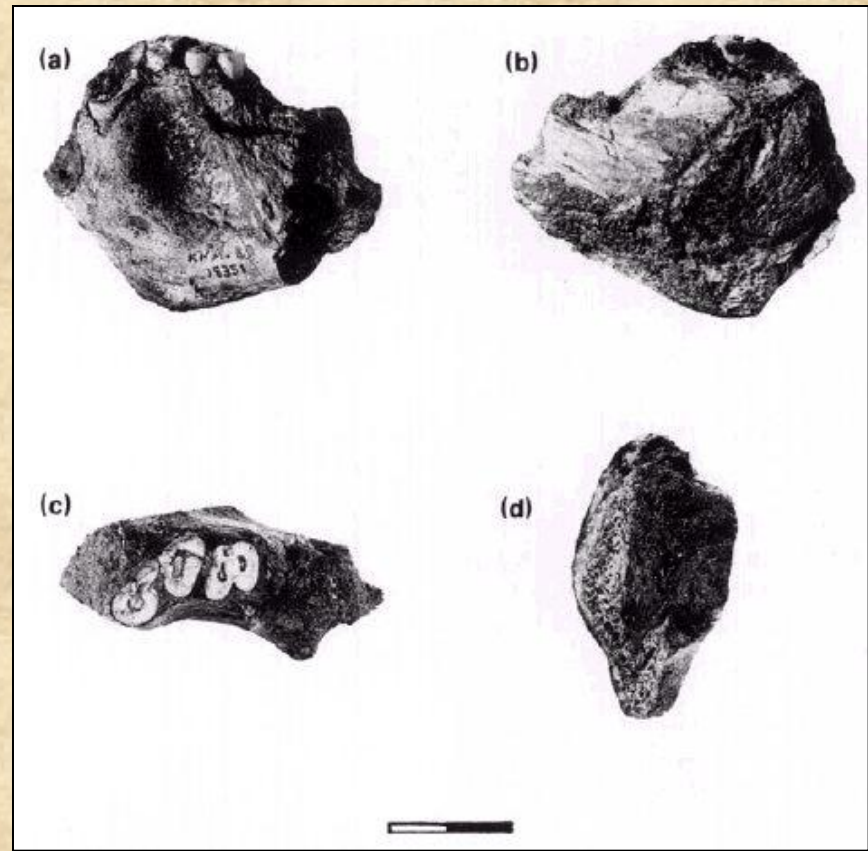
Bilofodontní molár cerkopitekoidních opic (vlevo) a pravý dolní molár zástupce nadčeledi *Hominoidea* s dryopitékovým vzorem neboli tzv. vzorem  $Y_5$  (uprostřed a vpravo). M — metakonid, P — protokonid, E — entokonid, H — hypokonid, H1 — hypokonulid



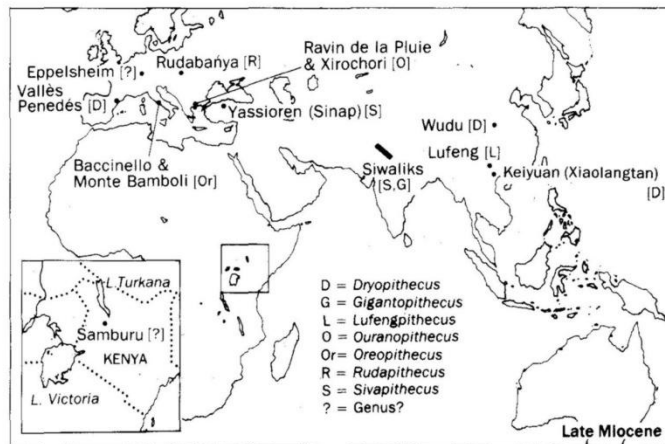
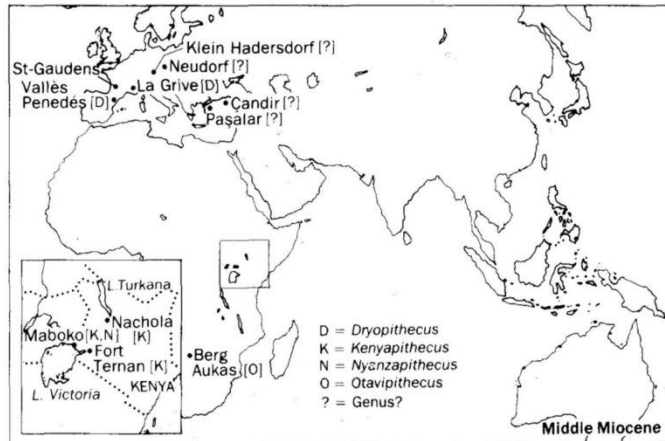
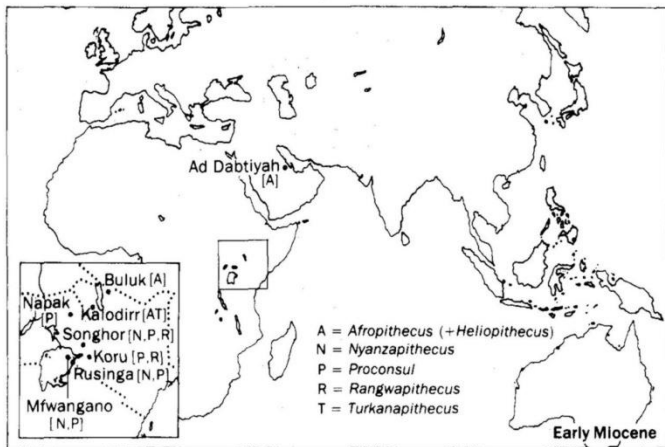
Nejstarší *Hominoidea* - svrchní oligocén  
**Lothidok hominoid - *Kamoyapithecus***



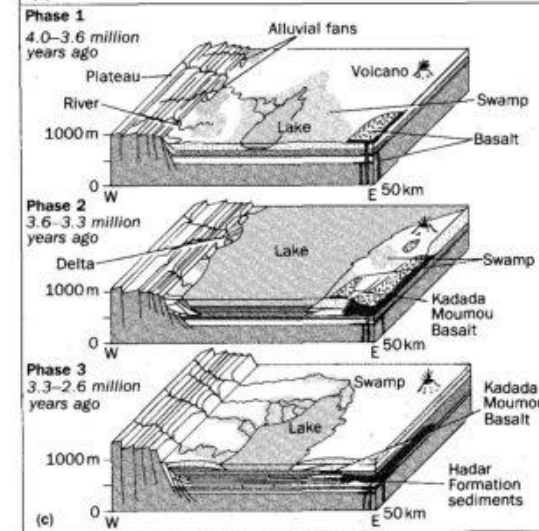
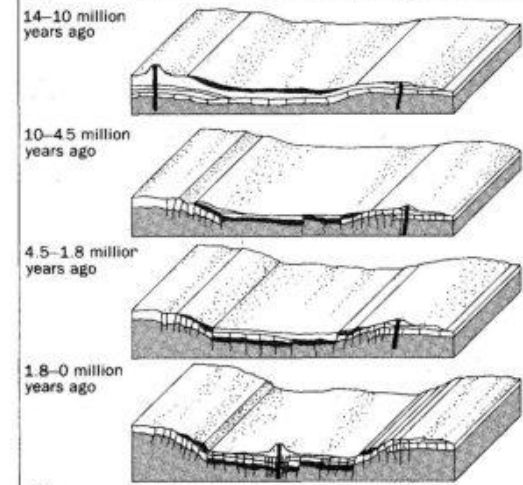
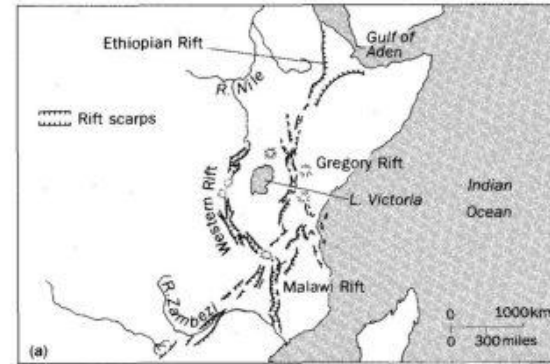
**Maxilla**



**Mandibula**

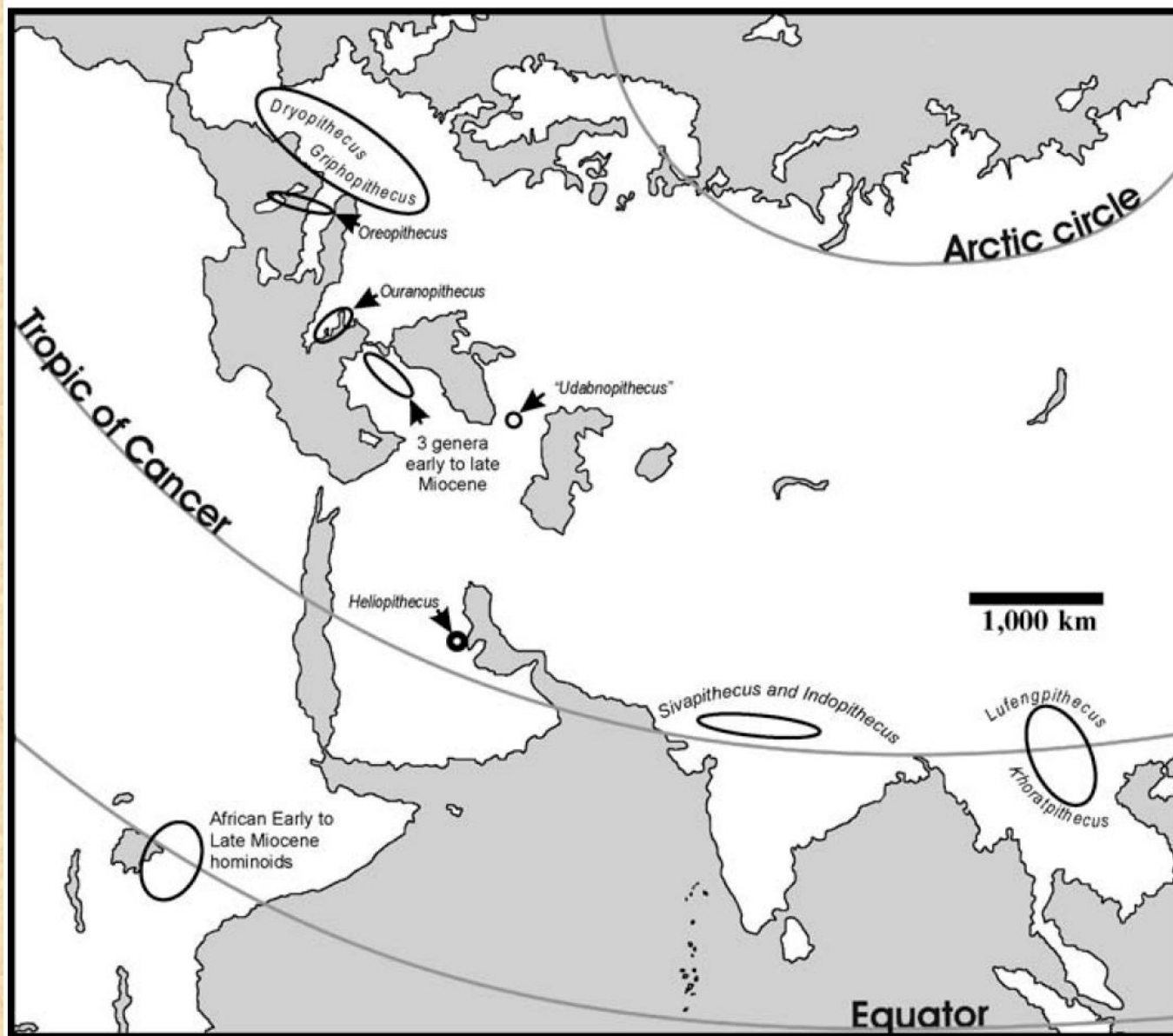


# Evoluční a biogeografické trendy v miocénu

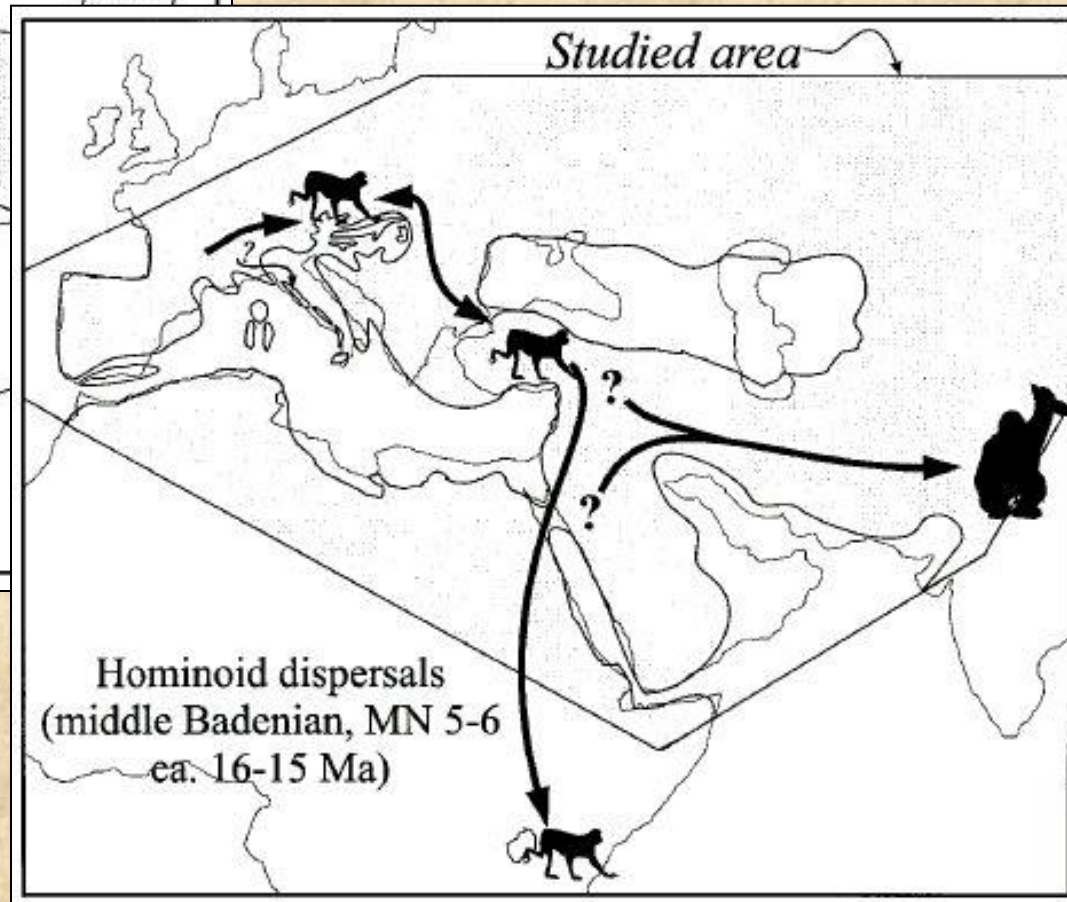
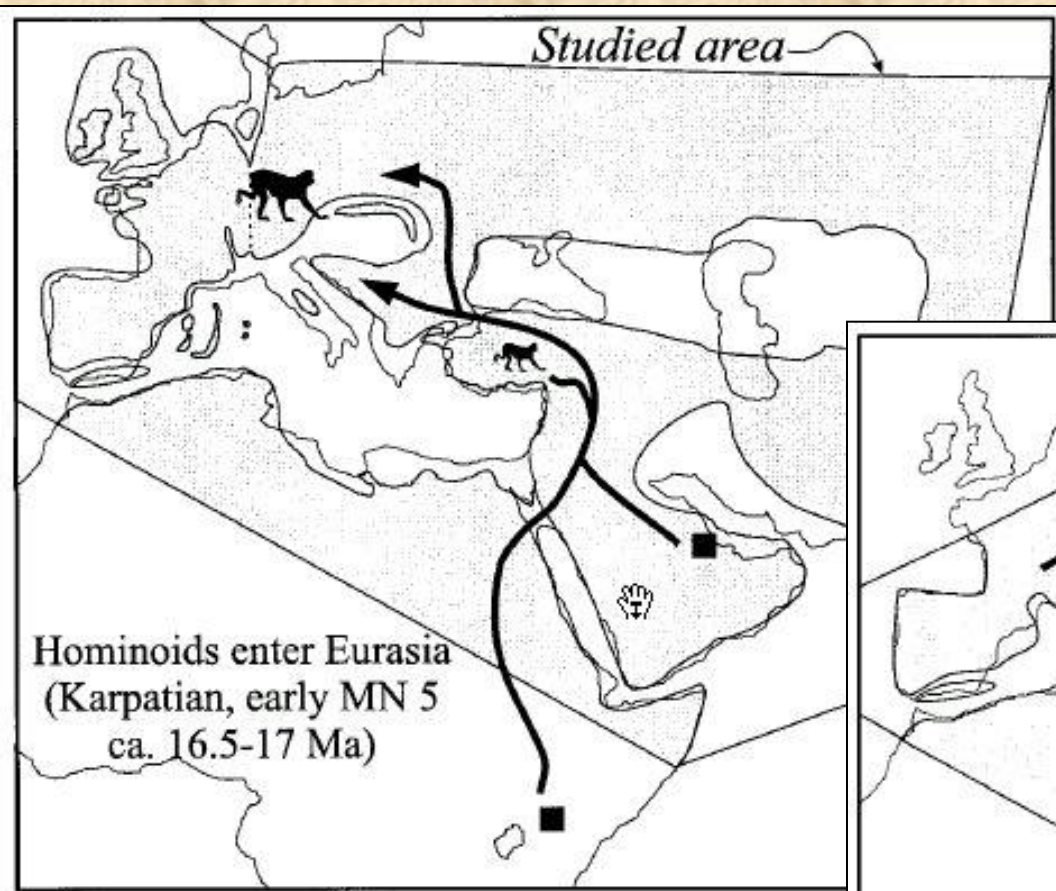




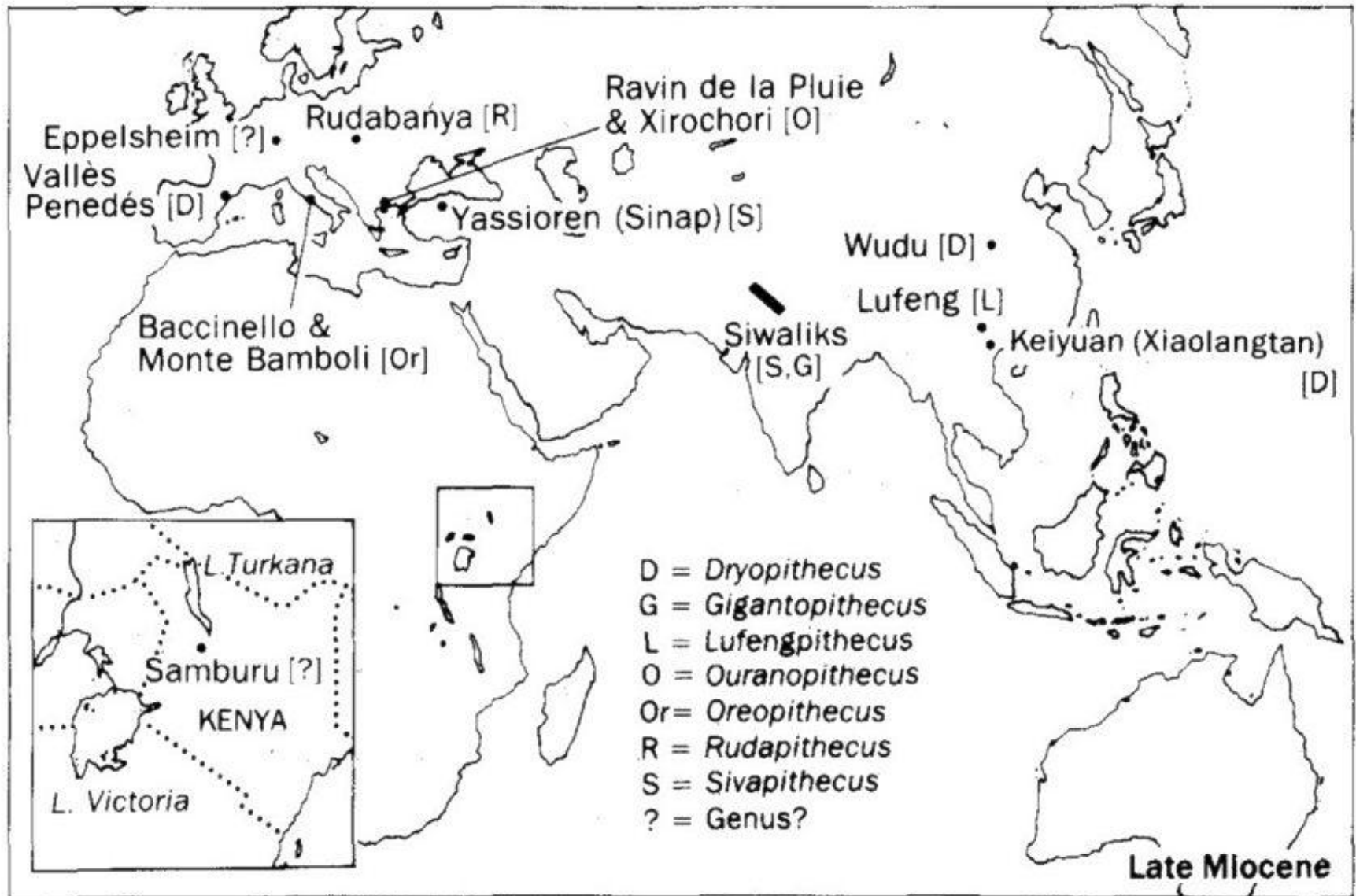
# Nejdůležitější oblasti s nálezy fosilních lidoopů



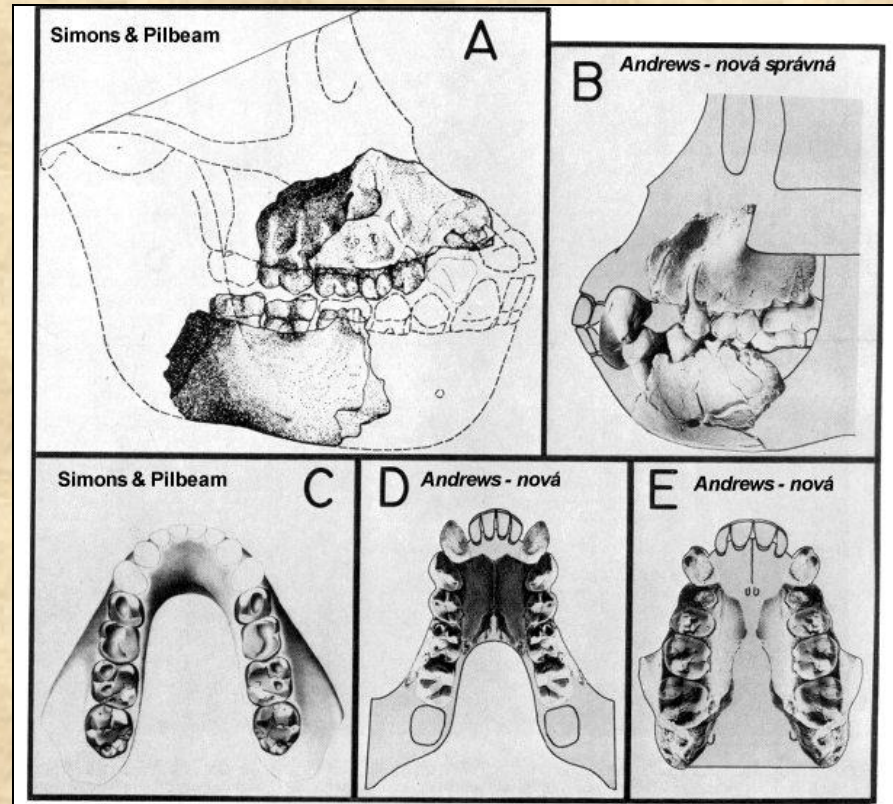
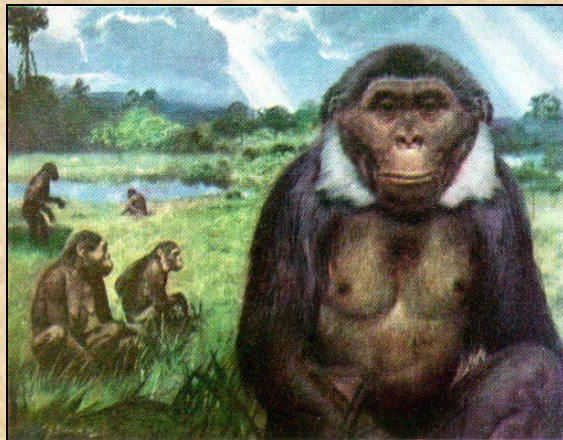
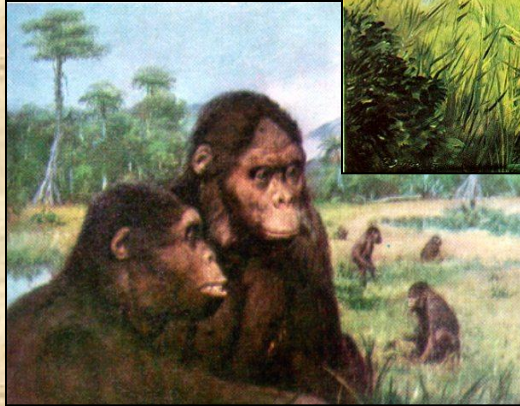
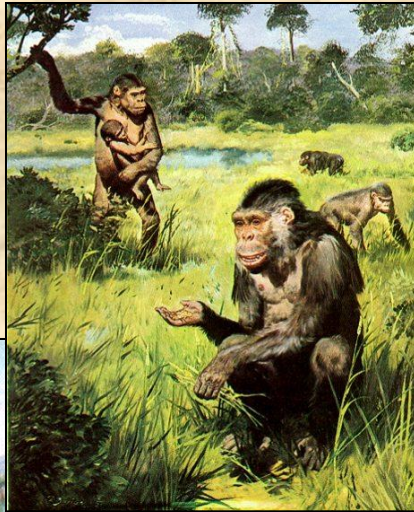
# Možné migrace do Evropy a zpět



# Svrchní miocén



# Případ *Ramapithecus*



## **Teorie sedících pojídačů semen C. Jollyho**

Lidský chrup, krátké čelisti a pohyblivý palec ruky vznikl v důsledku intenzivního sbírání semen

Tato teorie je ekologicky neodůvodnitelná a nemá naprosto žádné paleontologické důkazy

# *Oreopithecus* - bipedie ??

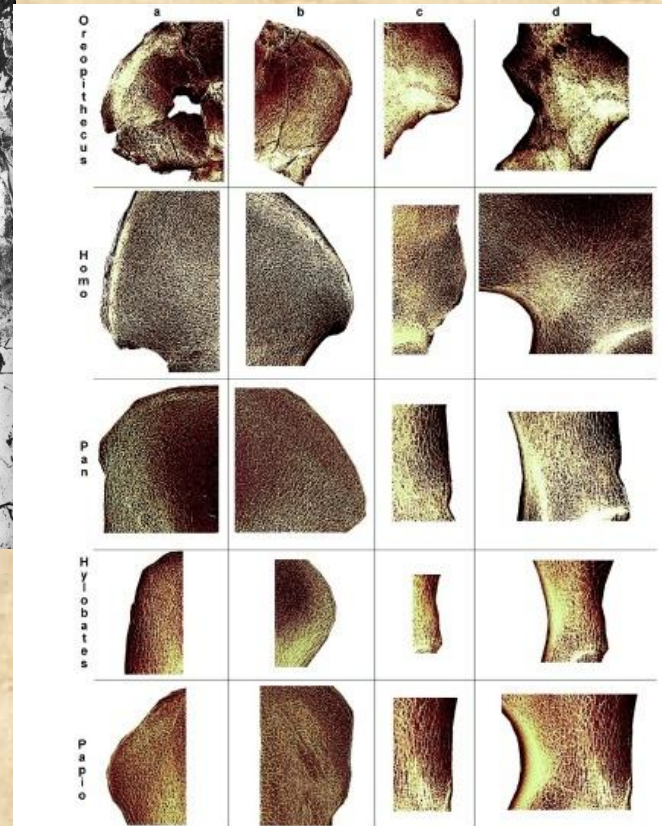
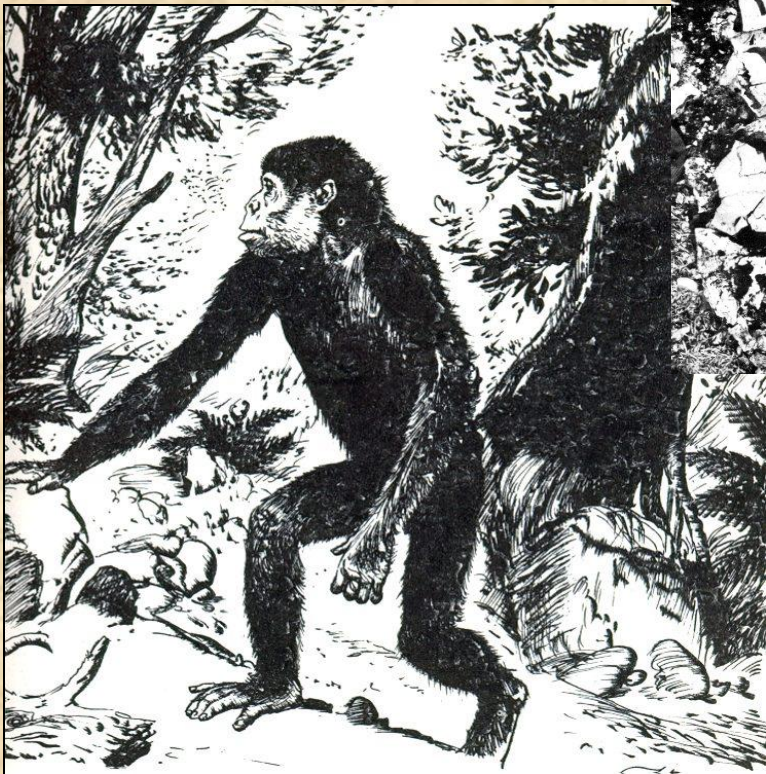


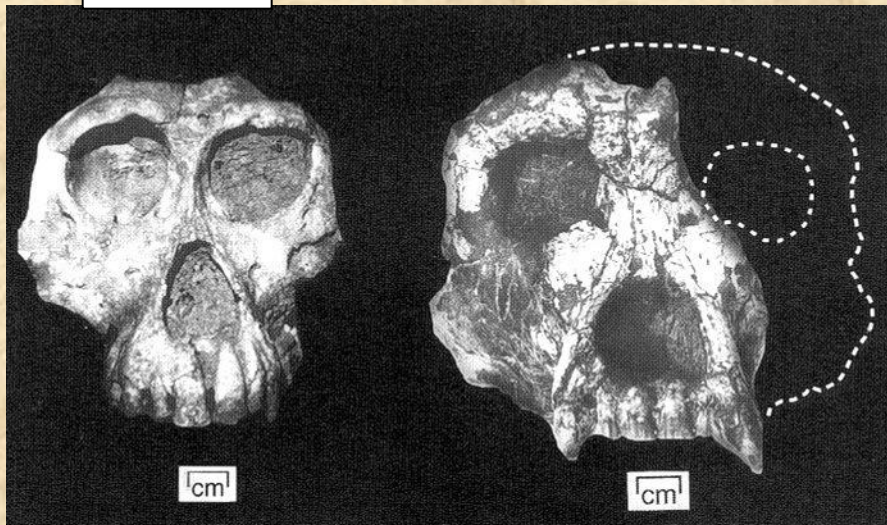
FIG. 3. Comparative site-specific structural morphology of the hip bone in *Oreopithecus* (IGF 11778), *Homo* (SCR 352), *Pan* (PVA 2706), *Hyllobates* (AIZU 1726), and *Papio* (AIZU PAL 109). Iliac blade posterosuperior margin (a), anterosuperior margin (b), anteroinferior margin (c), and suprasacetabular area (d) are shown. Because specimens are not reproduced to scale, the sizes of the trabecular mesh are not directly comparable.

# Čeľeď *Dryopithecidae*



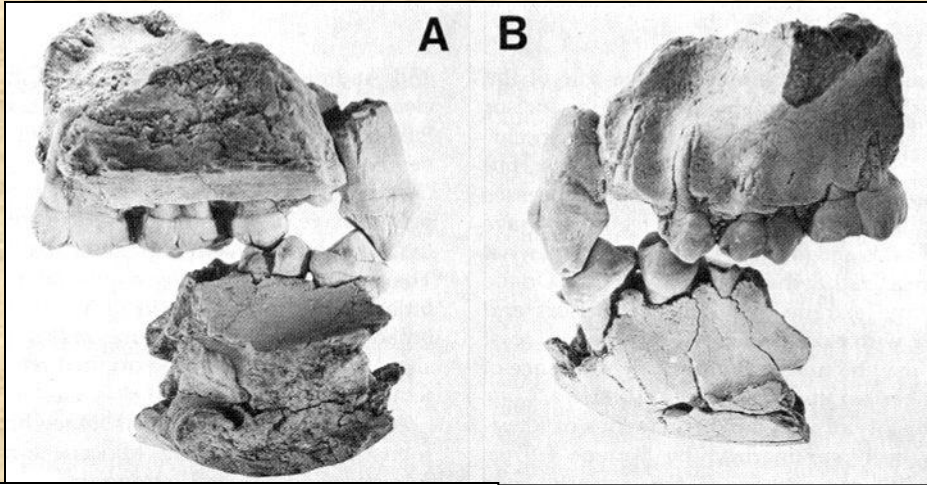
Přímí předchůdci hominidů  
Vyvíjeli se v Africe, Evropě  
a Asii v období před  
14 - 8 miliony lety

Evropa

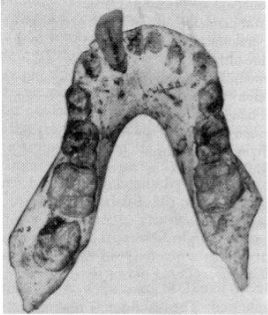


Sivapitéci  
Asie

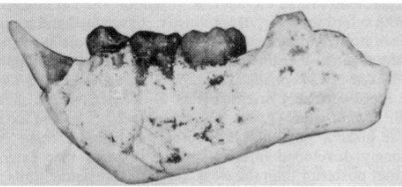
# Kenyapitéci



*Kenyapithecus wickeri*

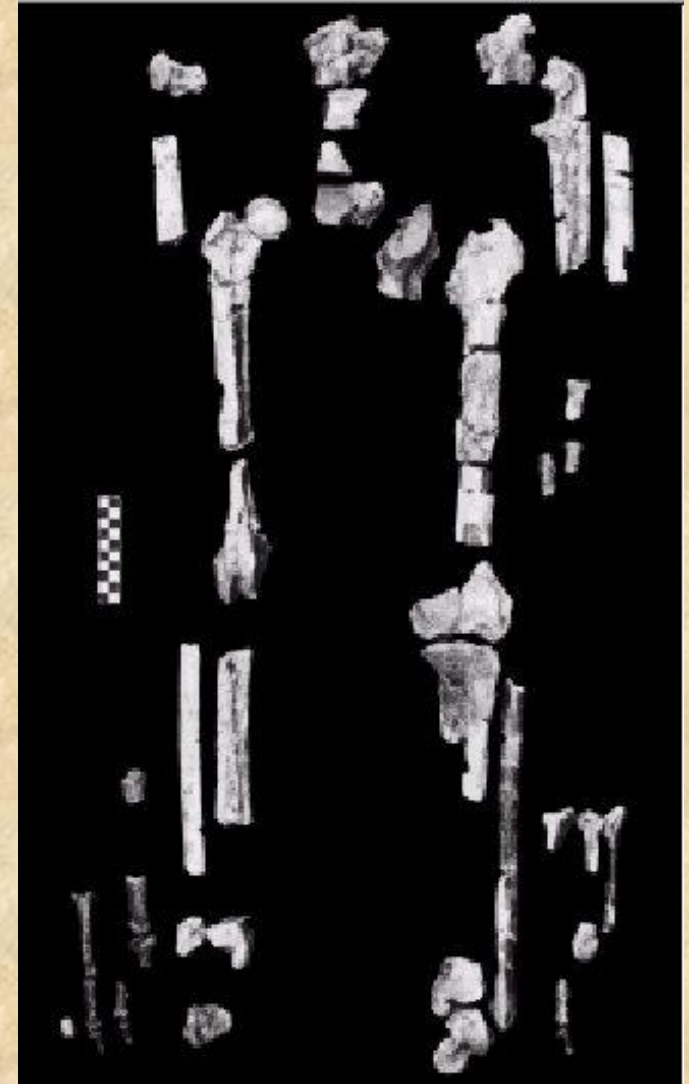


0 2  
cm



0 2  
cm

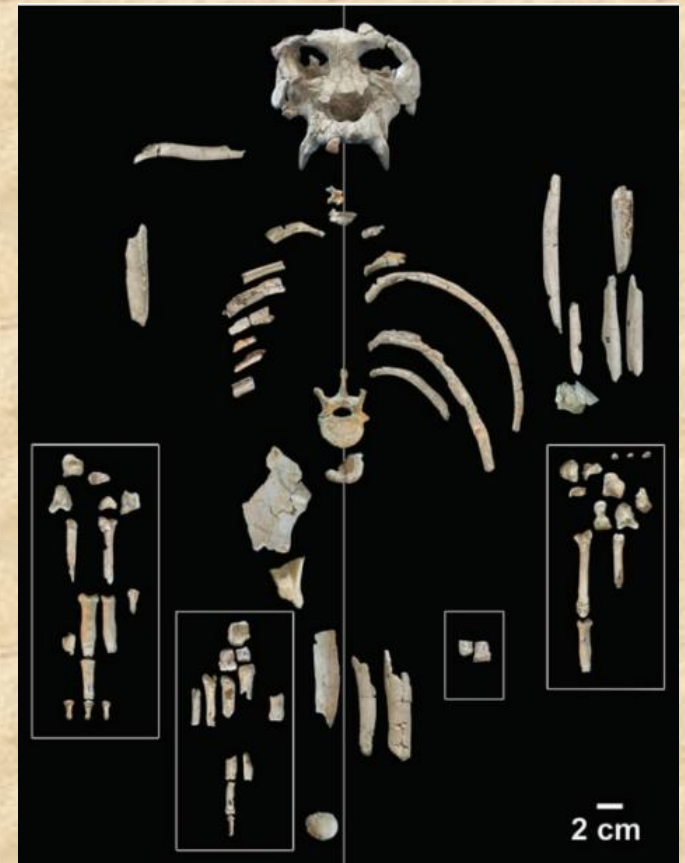
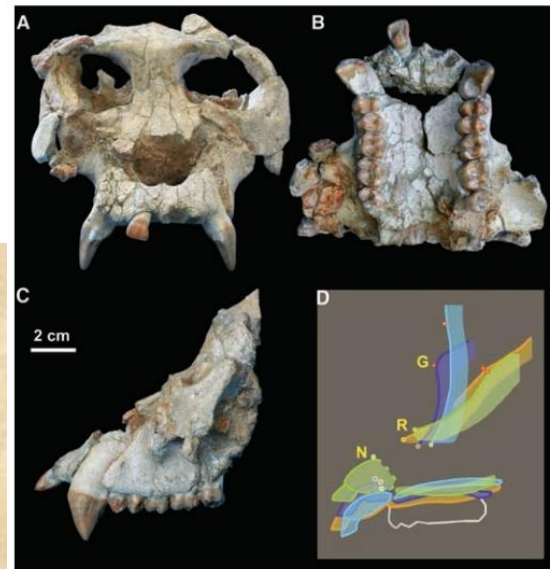
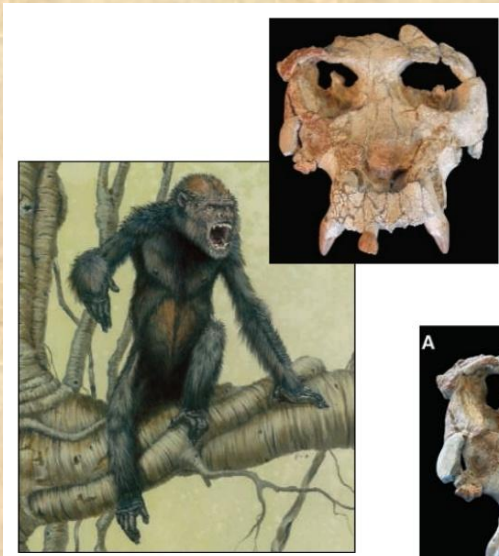
- Kenyapitéci jsou nejstarší skupinou dryopitékovitých, s mnoha starobylými znaky podobnými rodu *Equatorius*.
- V mnoha případech je jejich taxonomie nejasná, ale je již patrná diference končetin a progresivní změny na chrupu
- Jejich nejbližší příbuzný je *Griphopithecus* ze středního miocénu Evropy a záp. Asie.



*Kenyapithecus (Nacholapithecus)*

# *Pierolapithecus catalaunicus*

katalánský prapradědek dryopitéků ze středního miocénu





# Čínští dryopitéci - *Lufengpithecus*

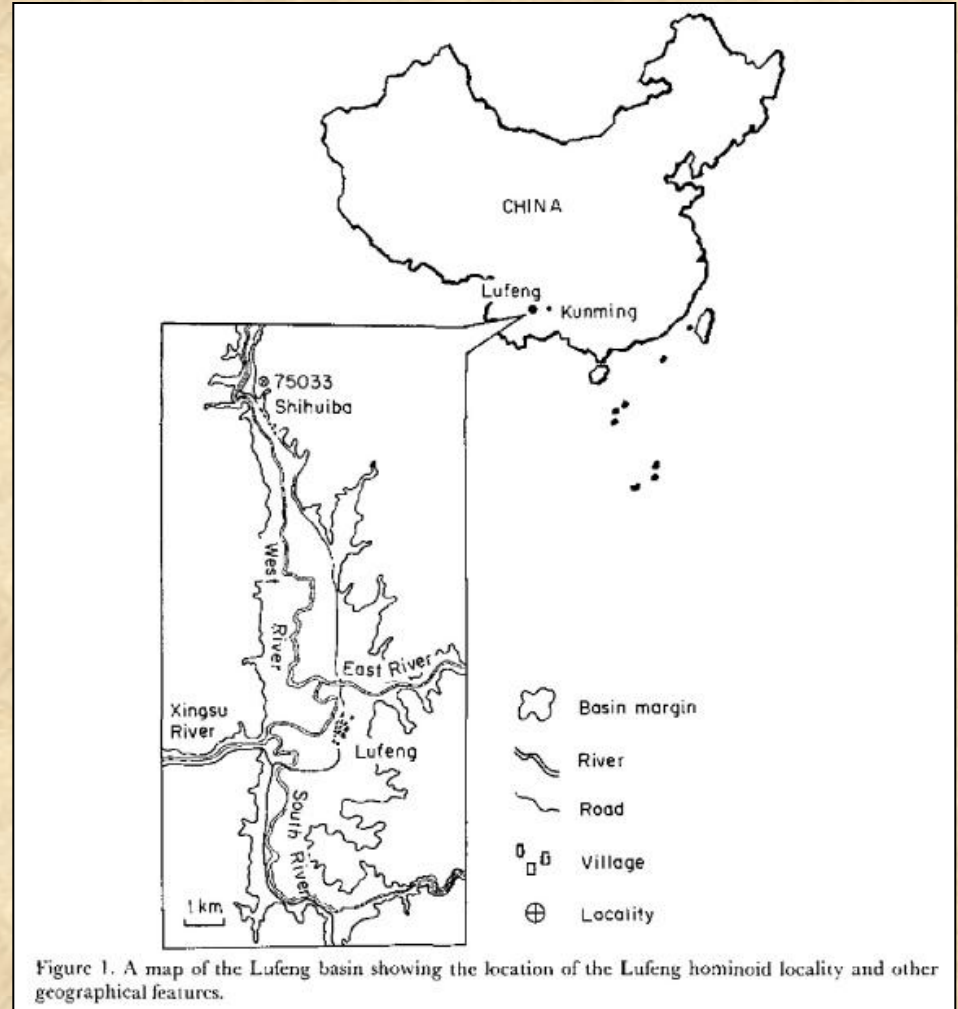
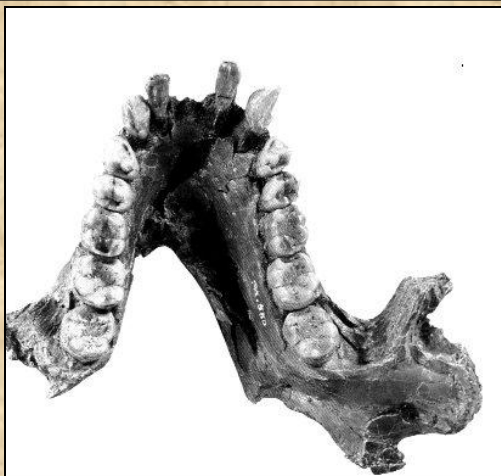


Figure 1. A map of the Lufeng basin showing the location of the Lufeng hominoid locality and other geographical features.

# *Dryopithecus* - evropský fenomén

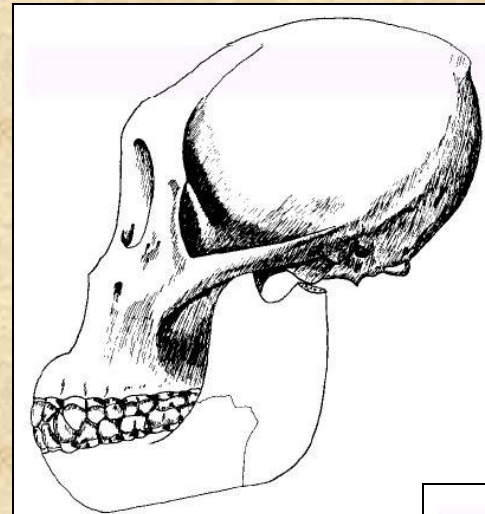
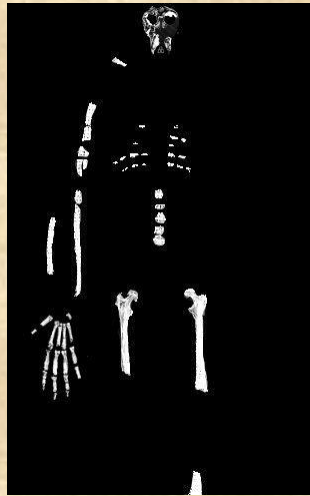
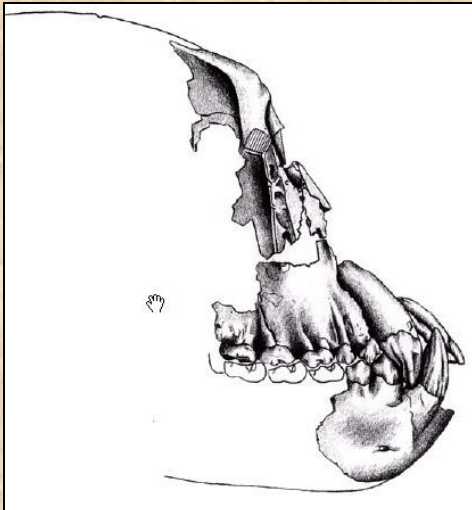
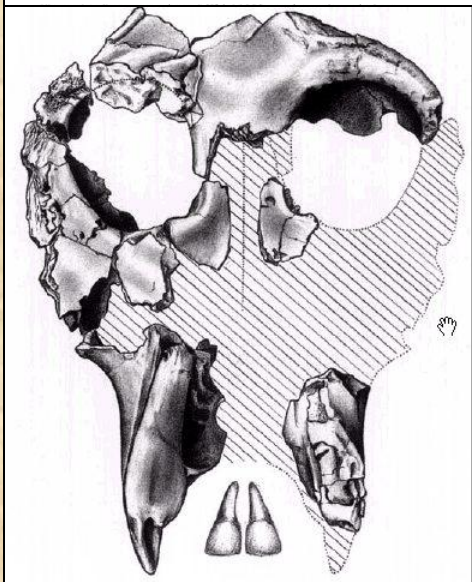


Fig. 10. Restoration of a female *D. brancoi*

*D. brancoi*  
více pozemní  
končetiny příliš  
nediferencované  
Maďarsko



*D. laietanus*  
Stromový, končetiny  
výrazně diferencované  
podobné orangutánům  
Španělsko



# Dryopitéci - hominidé před hominidy

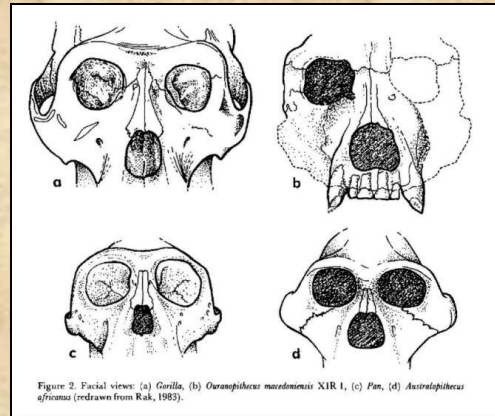
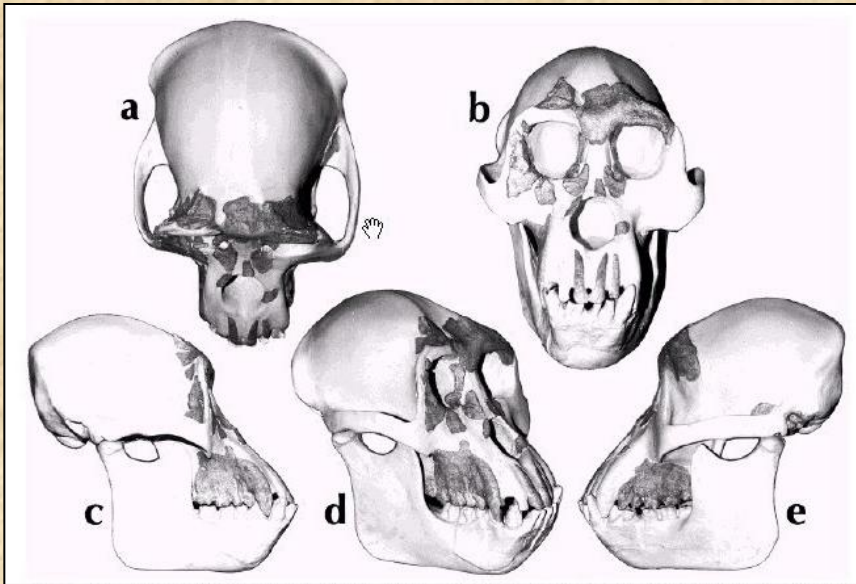
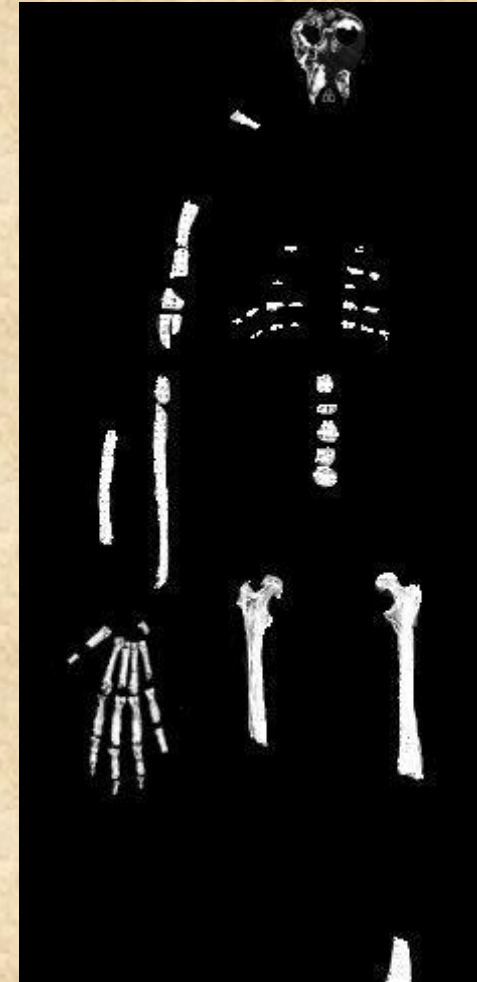
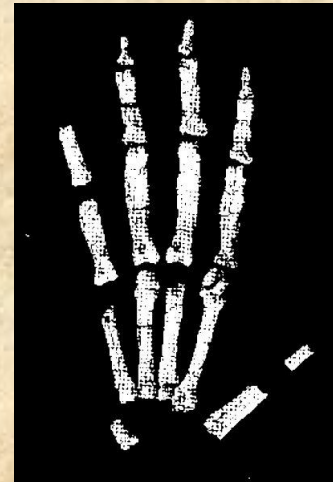
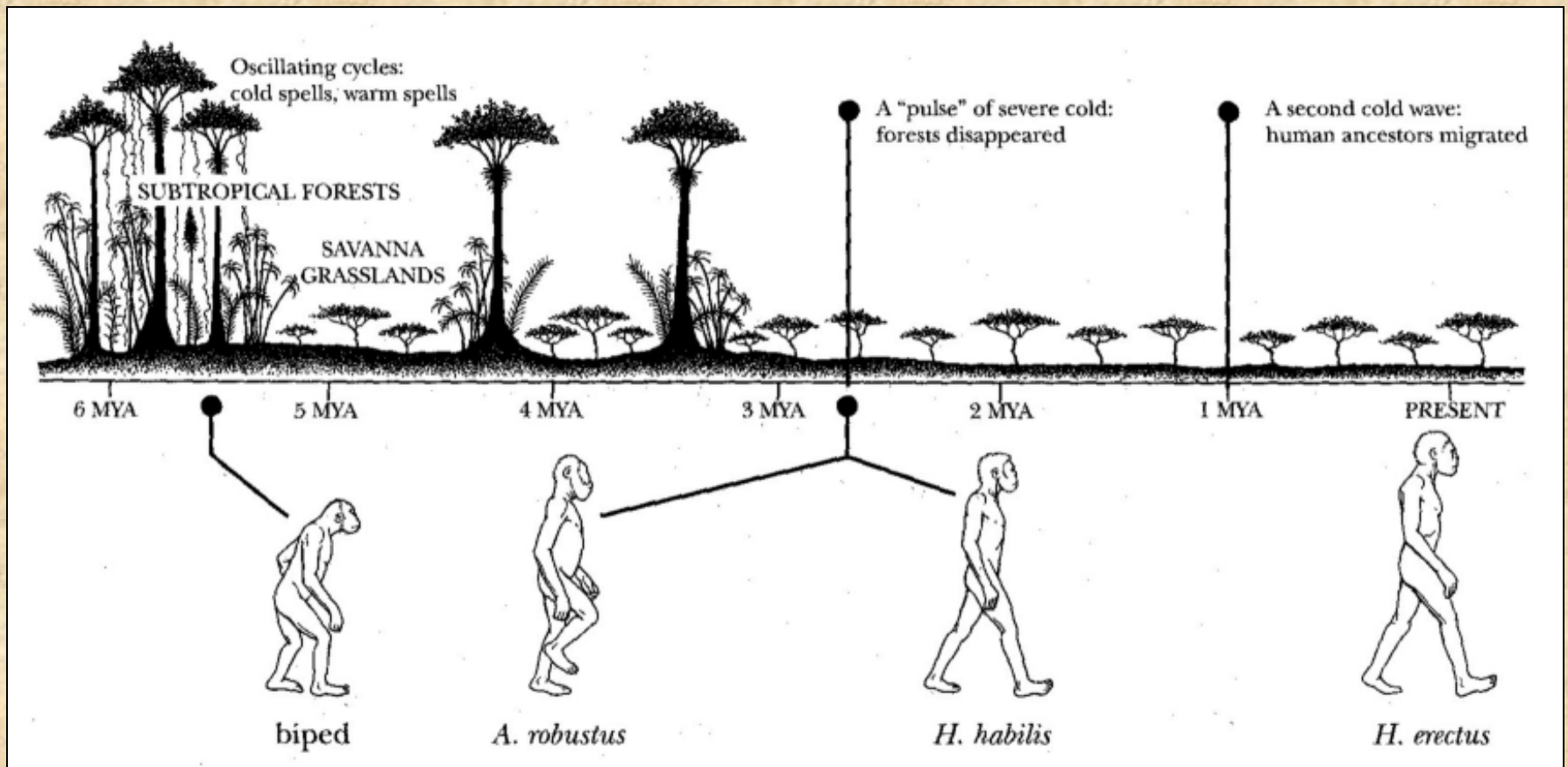


Figure 2. Facial views: (a) *Gorilla*, (b) *Orrorinpithecus macedonensis* XIR 1, (c) *Pan*, (d) *Australopithecus africanus* (redrawn from Rab, 1993).

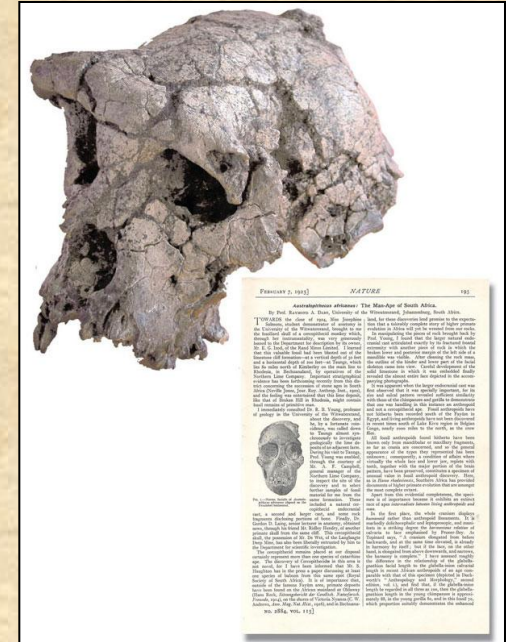
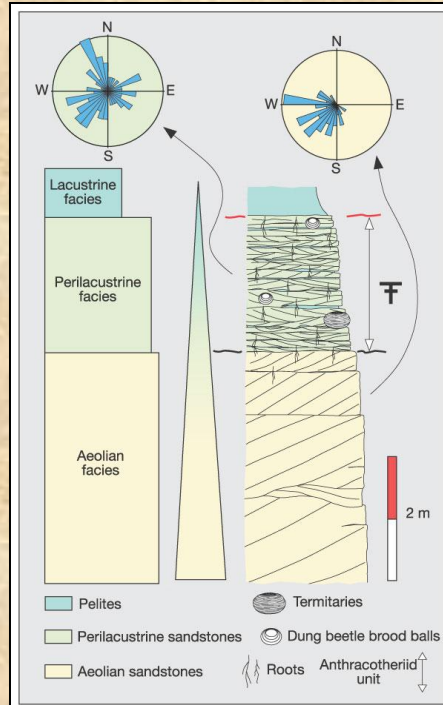
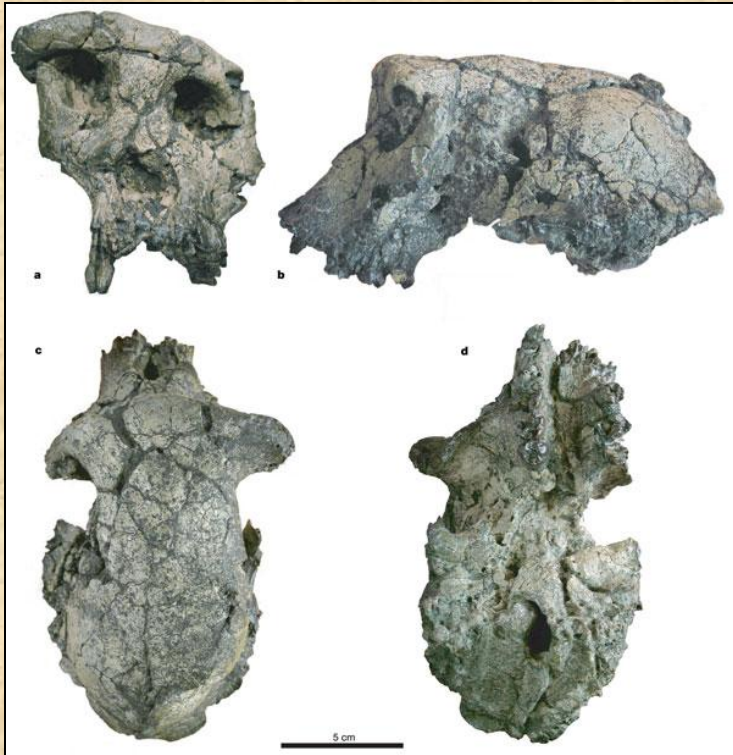
Dryopitéci měli velký mozek  
podle 3D rekonstrukce samice - 320 cm<sup>2</sup>  
Měli diferencovanou funkci končetin  
*D. laietanus* měl velmi dlouhé paže  
a velké ruce jako orangutani  
Stejně jako *Orrorinpithecus* měli již některé  
znaky na lebce i skeletu podobné hominidům



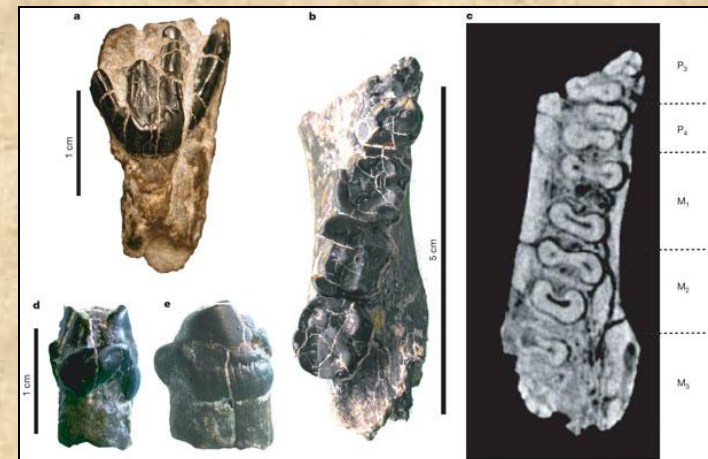
# Ekologické podmínky při vzniku a evoluci hominidů – Mesinské krize a evoluce homininů



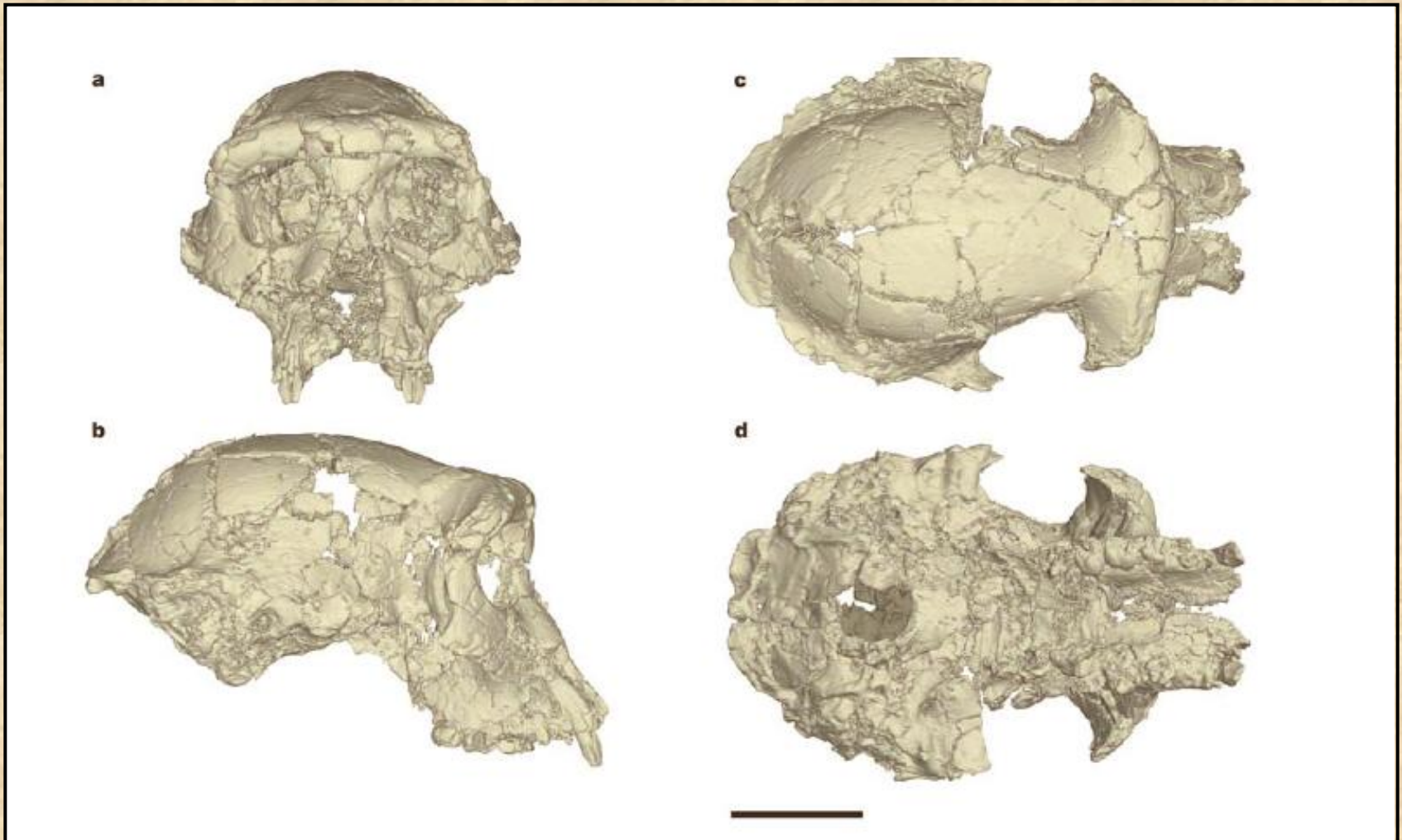
# Sahelanthropus tchadensis - první hominin



- Sahelantrop - 6 - 6,5 milionu let
- Špičáky nebyly zaostřovány jako u šimpanze
- Týlní otvor posunut dopředu
- Obličejový skelet je poměrně vertikálně stavěný
- Mohutný nadočnicový val



# *Sahelanthropus tchadensis* – rekonstrukce lebky



# Co je skutečným kritériem pro hominina? *Orrorin tugenensis* - Millenium Man

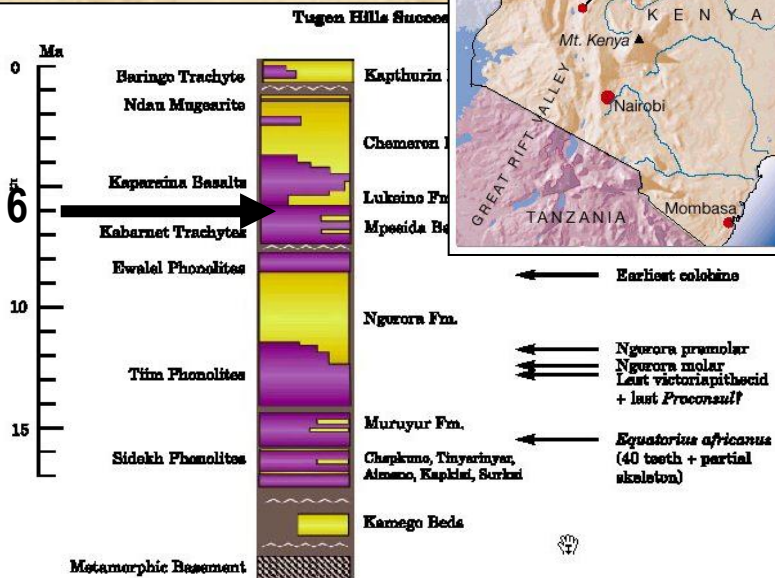
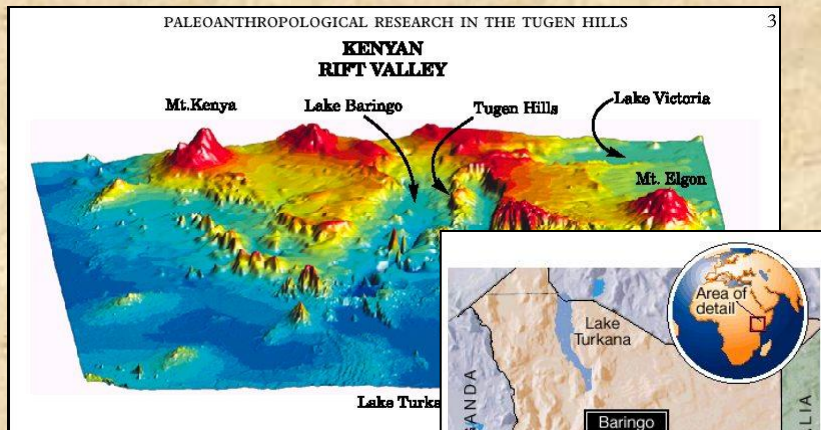
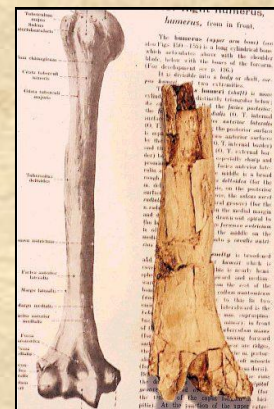


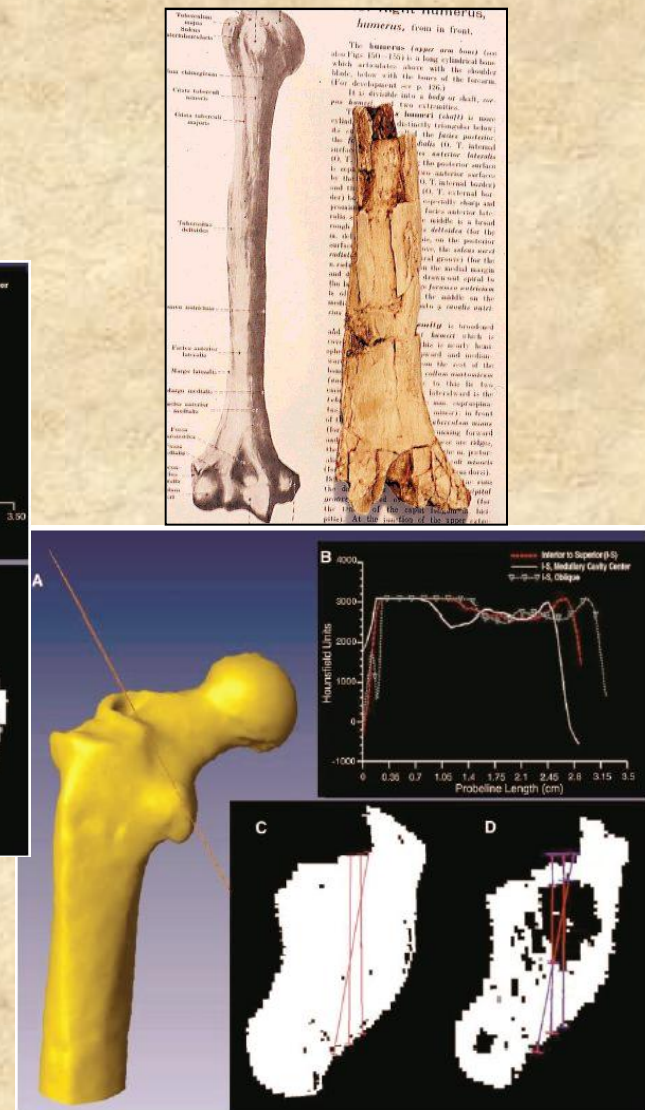
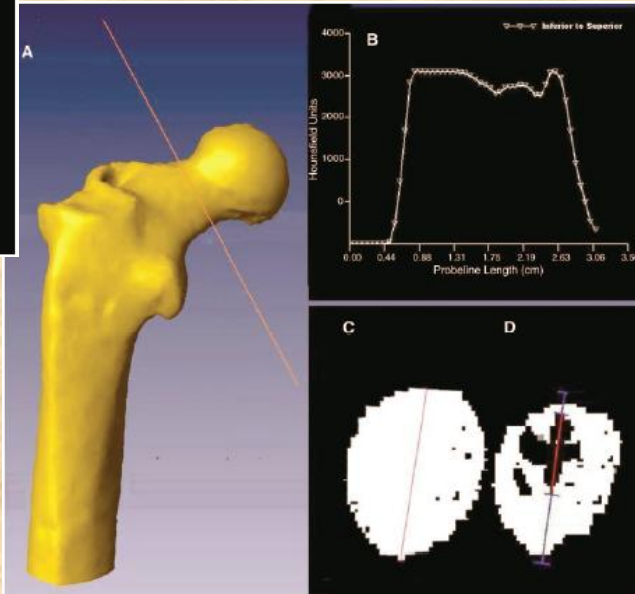
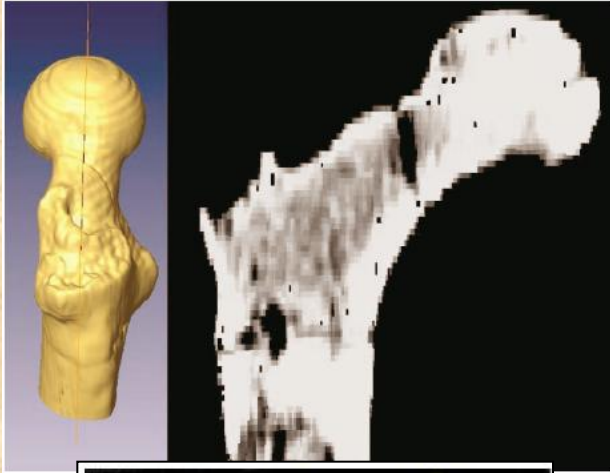
Figure 2. Stratigraphic succession through the Tugen Hills.



**Není prokázána bipedie  
Zuby mají lidoopí charakter**

# Je případná bipedie rozhodujícím kritériem pro hominina?

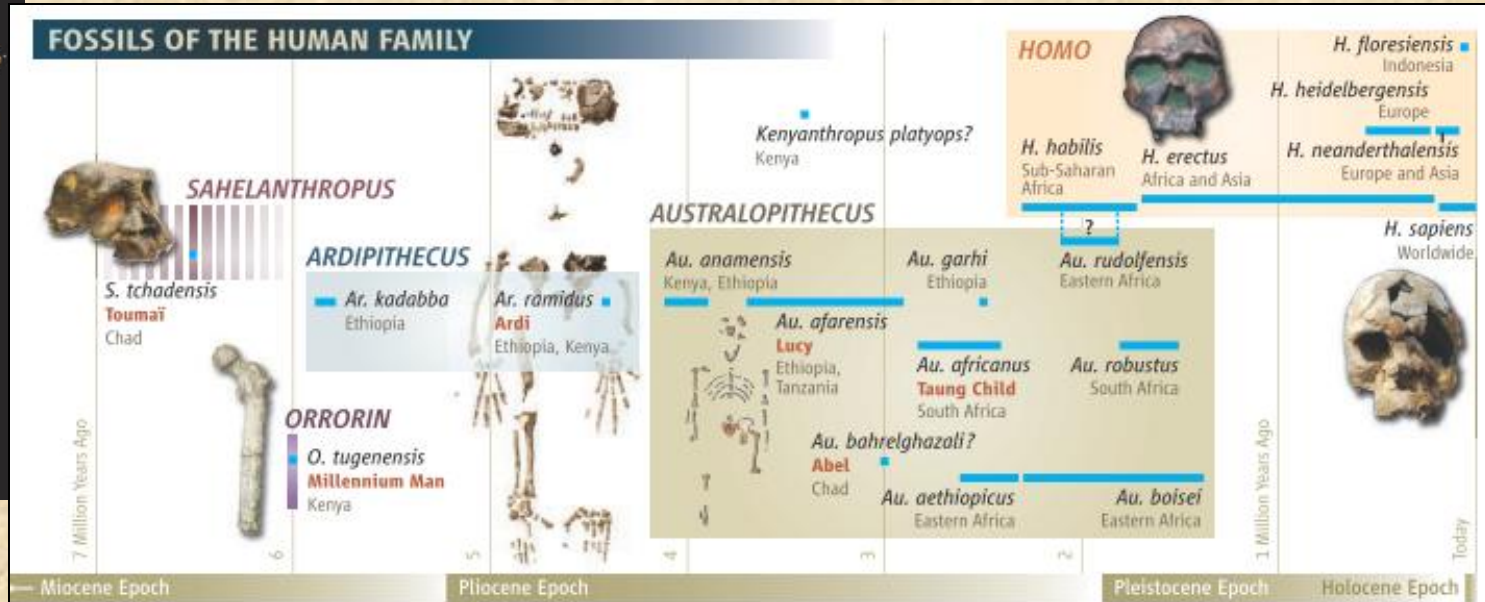
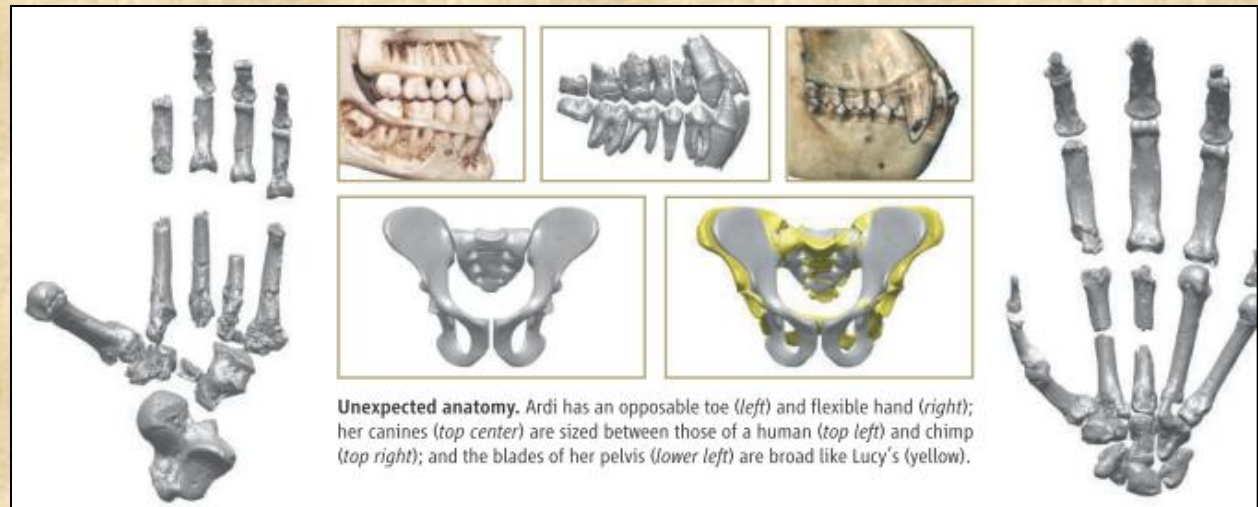
## *Orrorin tugenensis*



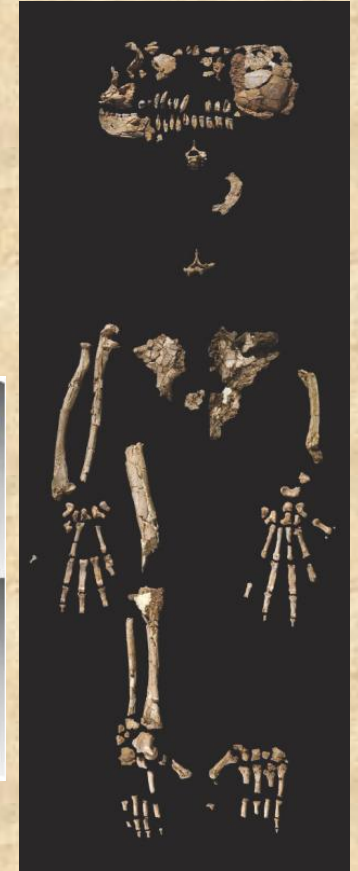
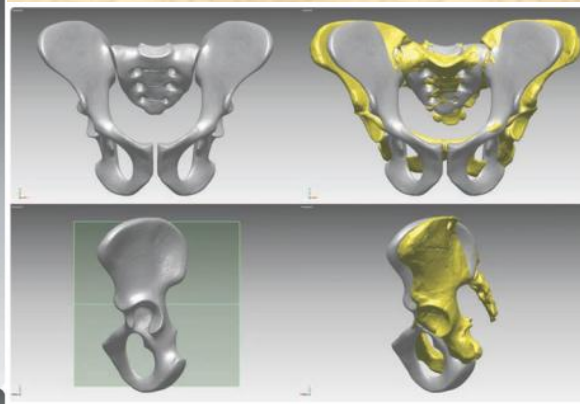
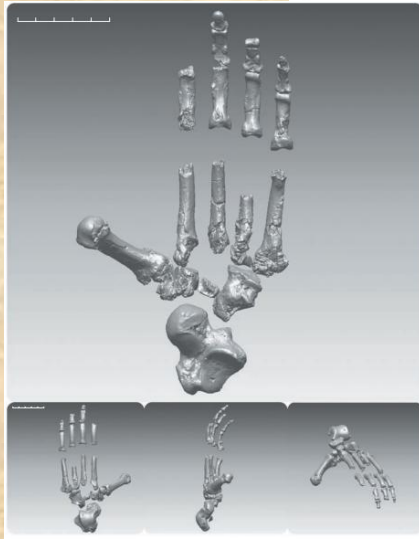
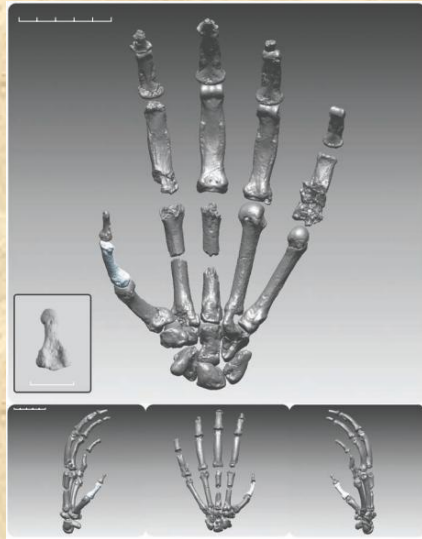
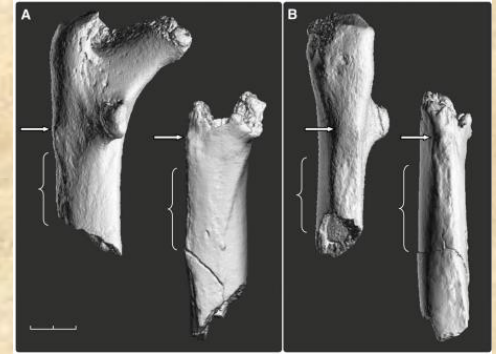
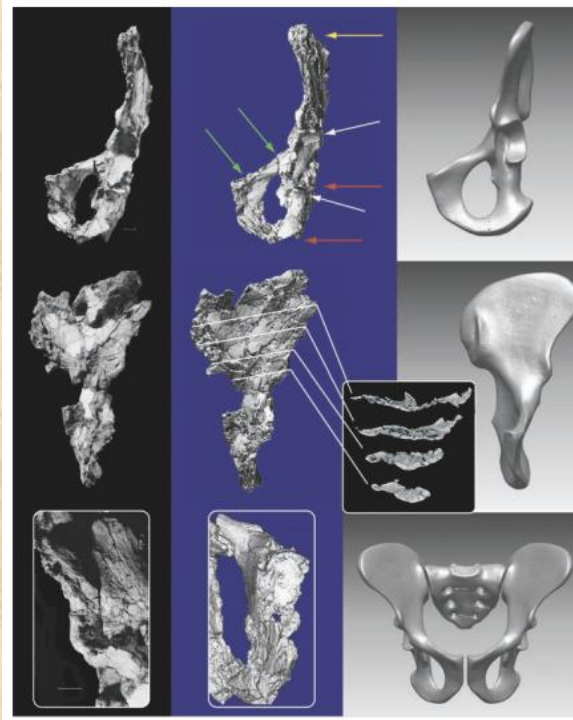
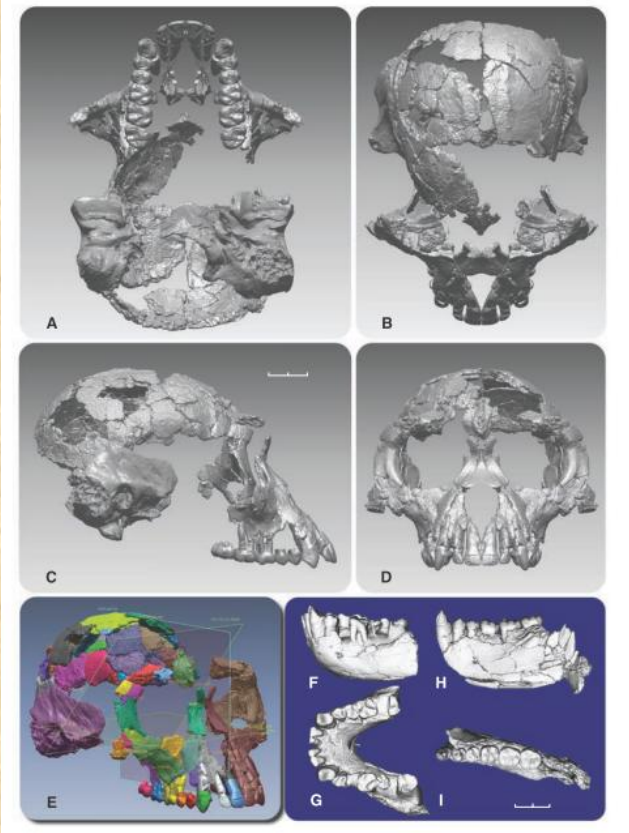




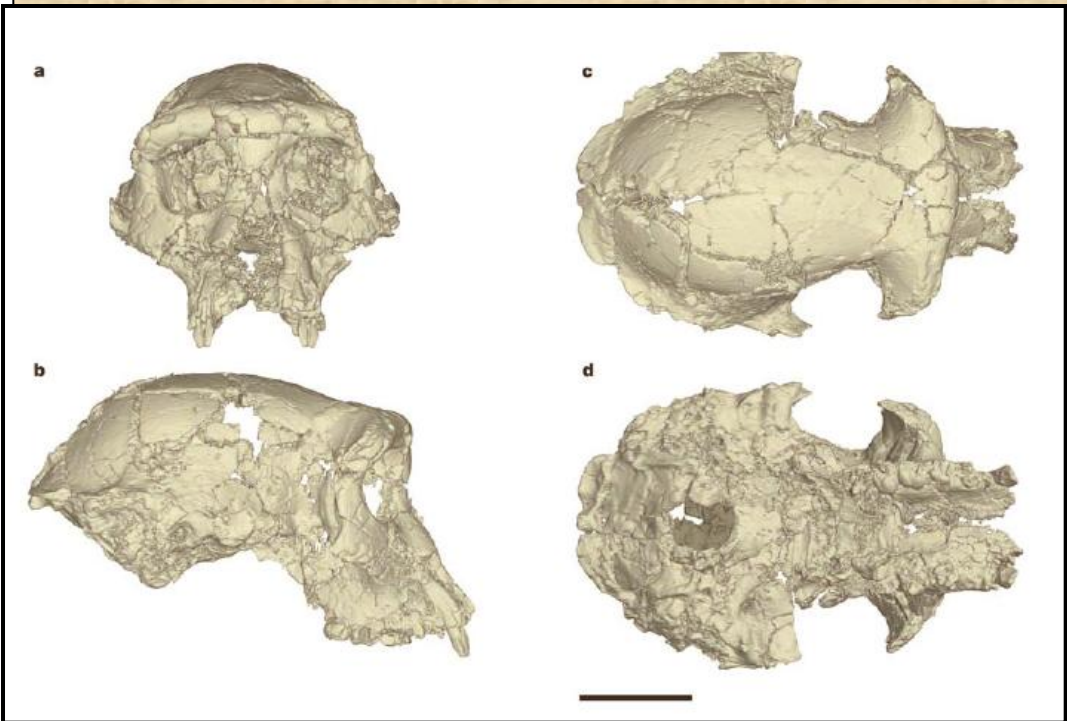
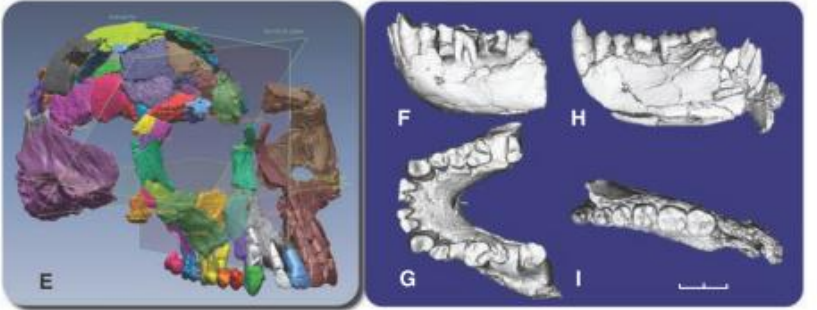
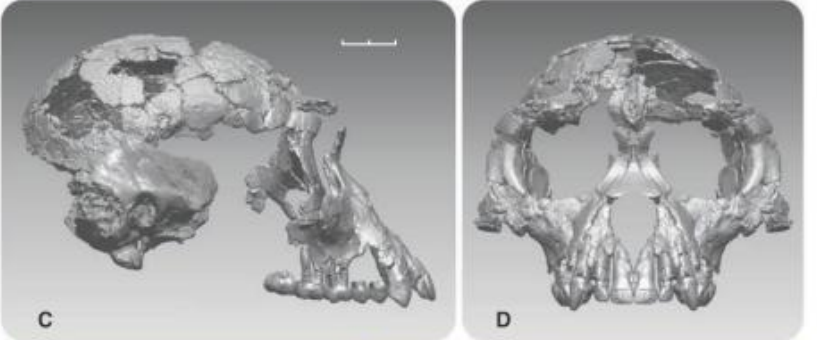
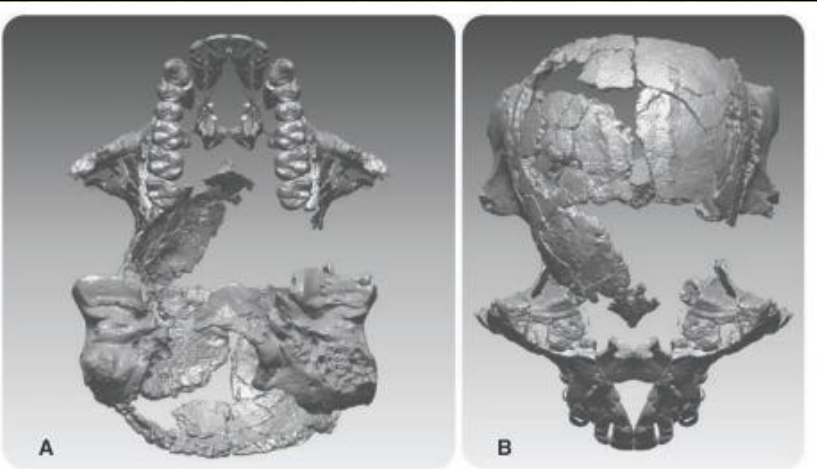
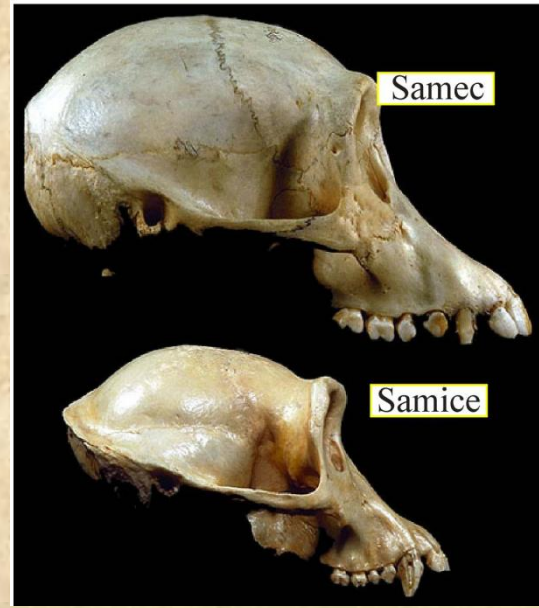
# Nové informace o *Ardipithecus ramidus*



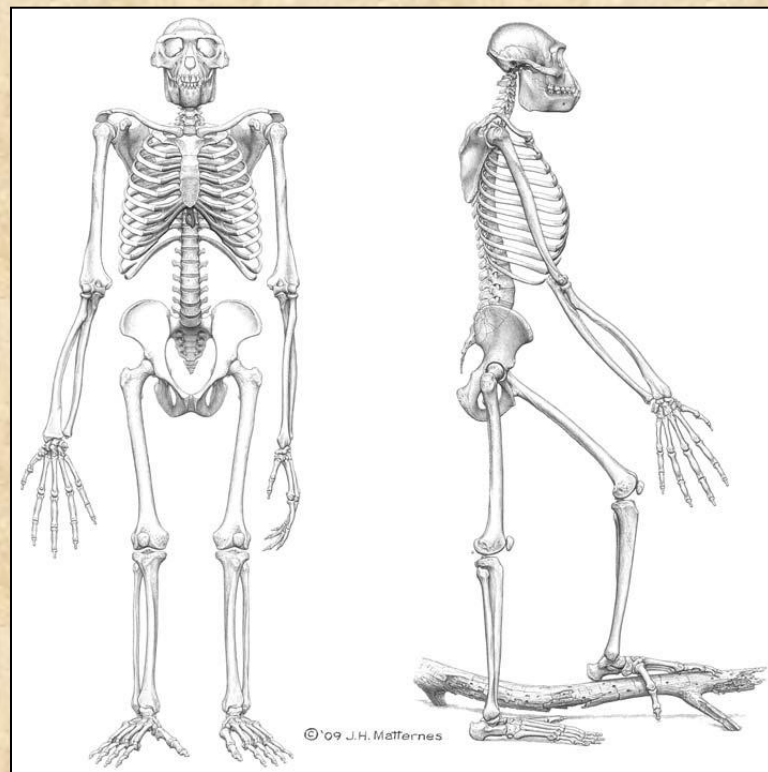
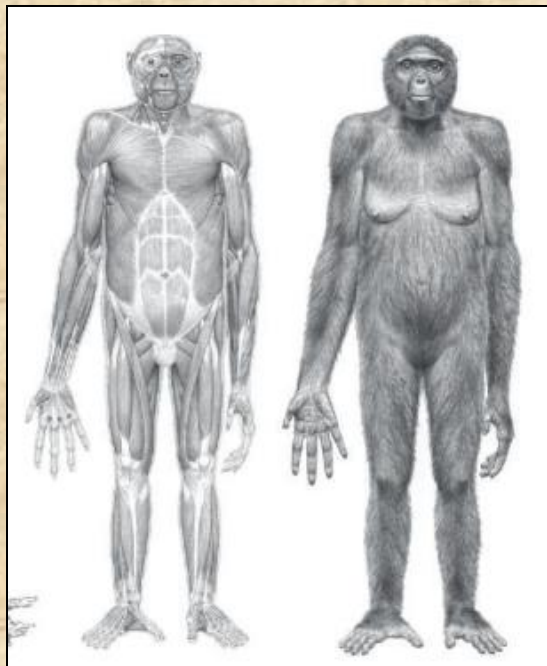
# Skelet *Ardipithecus ramidus*



# Porovnání lebky ardipitéka, sahelantropa a šimpanze

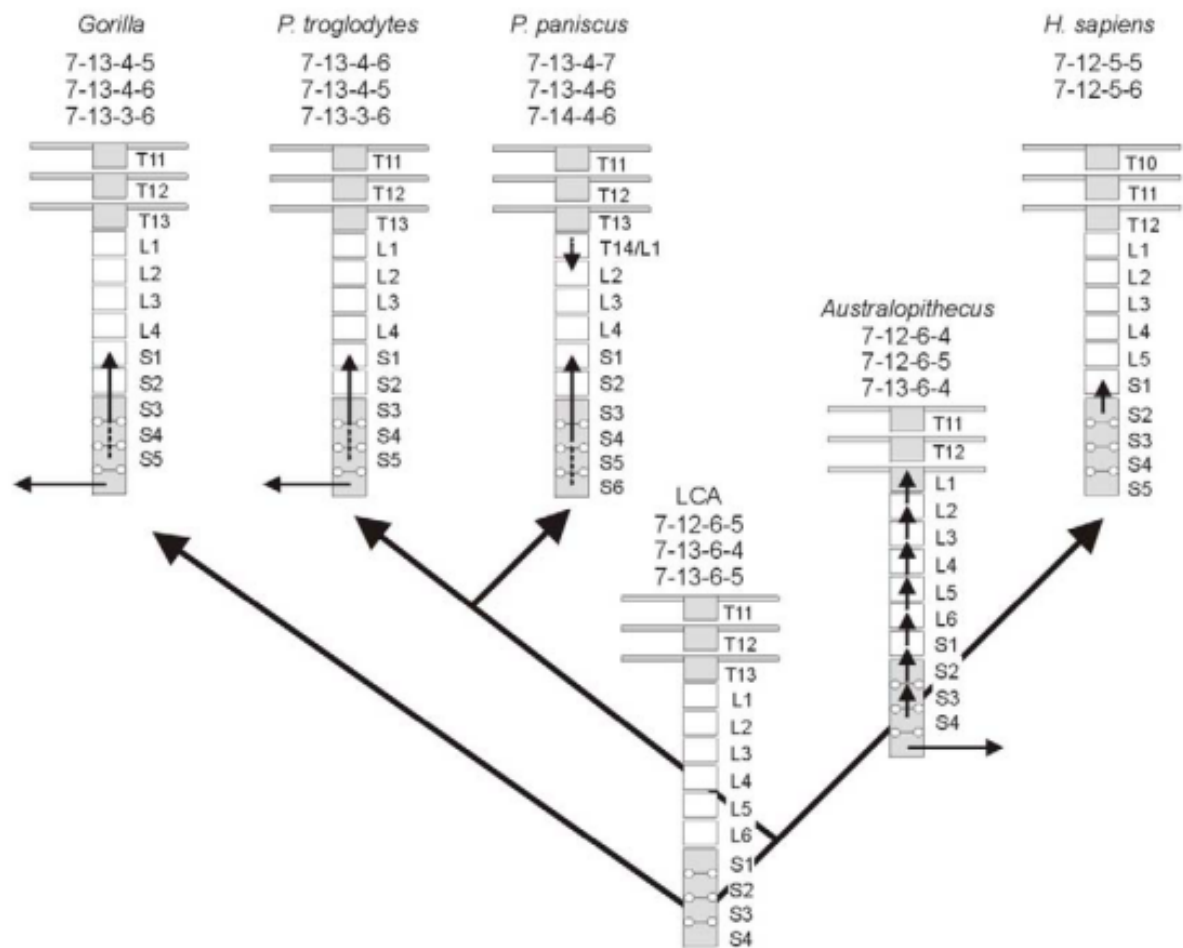


# Nové informace o *Ardipithecus ramidus*



	Výška	Hmotnost	BMI	Rohrer
Flores LB1	112,1	30,3	24,11	2,151
Flores LB1	115,0	31,0	23,44	2,038
Ardi Science	120,0	50,5	35,07	2,923
Ardi	122,8	34,5	22,86	1,861
Ardi	122,8	33,1	21,93	1,785
Ardi	126,2	35,0	21,97	1,741
Ardi	129,6	38,0	22,63	1,747
Bouri	130,6	38,0	22,29	1,707
Pan troglodytes	115,0	45,0	34,03	2,959

# Příklad využití analýzy HOX genů v evoluci skeletu hominidů



**Figure S15. Reconstructed Vertebral Patterning of Hominoids** (from 21). Most frequently observed axial formulas for each extant species are indicated along with the presumed modal formulas (those of highest probable frequencies) for the last common ancestor of *Gorilla* and humans (GLCA) and early hominids. A horizontal arrow indicates loss of a somite; a vertical arrow signifies changes in the positions of the anterior boundaries of *Hox* gene expression domains underlying indicated transformations of vertebral identities (22). Reduction in the number of somites contributing to the thoracic column is presumed to have occurred before the *Homo* horizon.