

## Mezozoik TRIJAS

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### Trijas

" podjela:

- . donji trijas (induan, olenekij, nekada skit ili verfen): 251 - 245 mil. god.
- . srednji trijas (anizik, ladinik): 245 - 228 mil. god.
- . gornji trijas (karnik, norik, ret): 228 - 200 mil. god.

" Njemačka:

- . d. trijas - Buntsandstein
- . sr. trijas - Muschelkalk
- . g. trijas - Keuper

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### Trijas

" važniji biološki događaji

- . d. trijas: prvi heksakoralji
- . sr. trijas: prvi dinosauri
- . g. trijas: diverzifikacija terapsida, rani sisavci

" važniji paleogeografski događaji

- . g. trijas: početak inicijalne dezintegracije Pangee

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### Trijas

- “ obnova života nakon permskog masovnog izumiranja:
  - . u potpunosti izumrle fuzulinide, rugozni i tabulatni koralji, trilobiti
- “ završava masovnim izumiranjem

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### Trijaski život u moru

- “ obilni mekušci
  - . amoniti
  - . razvoj bivalvi i puževa
  - . značajni i brahiopodi
- “ ježinci
  - . jak razvoj u prvoj polovici mezozoika
- “ konodonti
  - . ima ih još samo u trijasu

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### Trijaski život u moru

- “ alge
  - . zelene alge
  - . crvene alge
  - . modrozelene alge
- “ foraminifere

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## Trijaski život u moru



### „grebeni“

- obnovili se tek u sr. trijasu
- prvi grebenotvrci spužve i alge, a zatim pojava heksakorala
- u početku gradili nakupine do dubine od 3 m

Stanley, 2005, Freeman

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## Trijaski život u moru



A

- „morski gmazovi“
- plakodonti



B

Stanley, 2005, Freeman

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## Trijaski život u moru

- „morski gmazovi“
- nothosaur



Stanley, 2005, Freeman

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### Trijaski život u moru

- “ plakodonti i nothosauri izumrli koncem trijasa
- “ plesiosaur
- “ ichthyosaur
  - . gmaz sličan ribi
  - . "riba - gušter"

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### Trijaski život na kopnu



- “ kritosjemenjače formiraju stabla
  - . cycadi
  - . cycadeoidi
  - . konifere
- “ ginko - listopadno drvo

Stanley, 2005, Freeman

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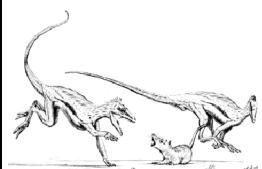
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### Trijaski život na kopnu



- “ rani sisavci
  - . razvili se iz terapsida
- “ dinosauro-morfi
  - . pretci dinosaura
  - . donji trijas

Stanley, 2005, Freeman

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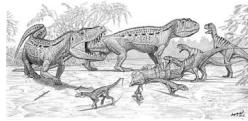
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### Trijaski život na kopnu



“ potomci  
dinosauromorfa  
. dinosauri  
. krokodili

Stanley, 2005, Freeman

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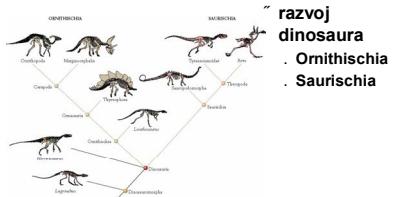
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### Trijaski život na kopnu



Stanley, 2005, Freeman

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### Klima

“ ogroman kontinent  
. ocean imao slab utjecaj  
. snažne sezonske oscilacije

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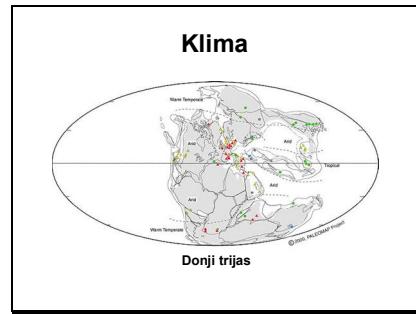
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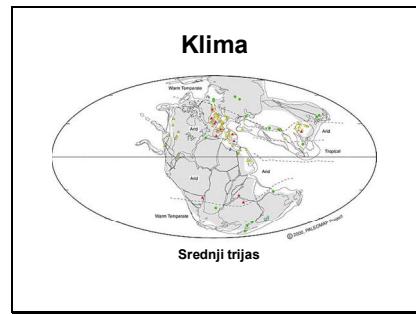
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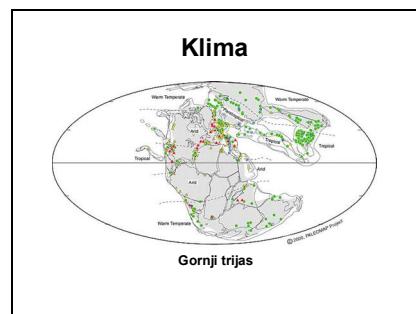
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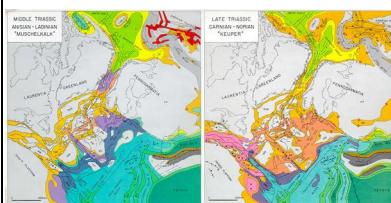
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## Paleogeografija



“ početak  
dezintegraci  
je Pangee  
koncem  
trijasa  
“ razvoj  
uskog rifta  
između  
južne  
Europe i  
sjeverne  
Afrike

## Europa



## Europa

### “ subdukciju zone

- . orogenetski procesi na prijelazu perma u trijas (do g. trijasa) sličniji hercinskoj orogenezi nego kasnijoj alpskoj orogenezi
- . Alpsko-karpatski pojasi

#### ~ Zapadne Alpe:

- . d. trijas: kvarciti, evaporiti u dva horizonta, dolomitični vaspenci
- . donji sr. trijas (anizik): prevladavaju vaspenci; zatim vaspenci s amonitima
- . gornji sr. trijas (ladinik): plitkovodni vaspenci, malo tufova

Europa

- donji g. trijas (karnik): šejlovi i pješčenjac; vapnenci ("halštatski facies")
  - srednji g. trijas (norik): plitkovodni vapnenci (Dachstein) i dolomiti (Hauptdolomit)
  - gornji g. trijas (ret): vapnenci i laporji; klastiti

# Europa

"Južne Alpe

- . donji d. trijas (sajkske naslage):
    - . gornji d. trijas (kampilske naslage):
    - . donji sr. trijas (anizik):
      - podjela na tri zone:
        - » Gracilis- zona
        - » Decurtata- zona
        - » Trinodosus- zona
  - . gornji sr. trijas (ladinik):
    - podjela na dvije zone:
      - » Reitzi- zona
      - » Lommeli- zona

# Europa

- . donji g. trijas (karnik):
  - . srednji i gornji g. trijas (norik, ret):

## Europa

### “ kontinentalni prostori

- Njemačka (epikontinentalni razvoj)
  - ~ d. trijas - Buntsandstein:
  - ~ sr. trijas - Muschelkalk: transgresija -
  - ~ g. trijas - Keuper:

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## Hrvatska

- ~ donji trijas: uglavnom klastiti (na permским naslagama) -
- ~ srednji trijas: anizik - ugl. karbonati; ladinik - vapnenci i dolomiti -
- ~ gornji trijas: klastiti transgresivni zbog emerzije između sr. i g. trijasa, zatim karbonati -
- ~ vulkaniti (sr.-g. trijas): Senj, Donje Pazarište, Vis, Jabuka, Kalnik
- ~ Medvednica, Kalnik (sr.-g. trijas): dubokomorski razvoj - vapnenci (konodonti), radiolariti, šejlovi, pillow lava, toleitni metabazalți

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## BOSNA

- ~ *Srednjebosansko Škriljavo gorje*
- snažni tektonski pokreti u srednjem trijasu
- izdizanje blokova, emerzija, formiranje kopna
- nastanak boksita
- transgresija u gornjem triasu

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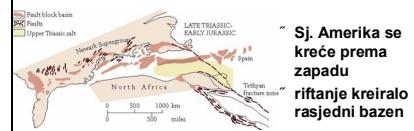
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### Tektonski događaji - istočne SAD

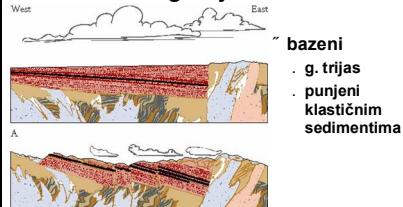


Geološki oblici istočne Sj. Amerike i susjednih područja u vrijeme gornjeg trijasa i donje jure.

- “ Sj. Amerika se kreće prema zapadu
- “ riftanje kreiralo rasjedni bazen

Stanley, 2005, Freeman

### Tektonski događaji - istočne SAD



B Središnji Connecticut, g. trijas - donja jura.

Stanley, 2005, Freeman

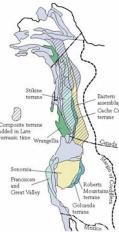
### Tektonski događaji - zapadne SAD



- “ klima suha
- “ kopneni dio
- “. petrificirana šuma

Stanley, 2005, Freeman

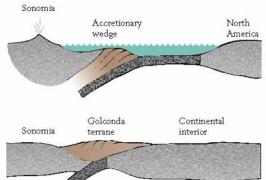
## Tektonski događaji - zapadne SAD



- „rast akrecijom egzotičnih terena
  - . područja otočnih lukova
  - . mikroploče

Stanley, 2005, Freeman

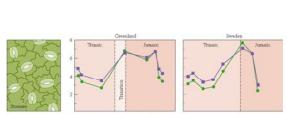
## Tektonski događaji - zapadne SAD



- akrecija
  - Golconda
  - Sonomija

Stanley, 2005, Freeman

## Masovno izumiranje



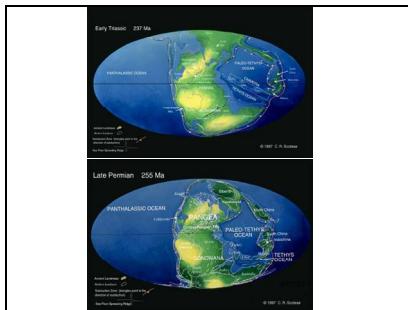
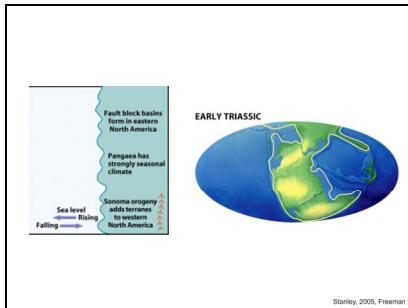
- "globalno zatopljenje  
konac trijasa  
vulkanska aktivnost oslobođila velike količine CO<sub>2</sub>

Povećanje koncentracije CO<sub>2</sub> u atmosferi i glavne godišnje temperature.

Stanley, 2005, Freeman

## Masovno izumiranje

- izumrlo oko polovice morski rodova
  - plakodonti i konodonti izumrli u potpunosti
  - izumrle mnoge bivalve, amoniti, plesiosauri i ichtyosauri
  - na kopnu preživjelo samo nekoliko vrsta terapsida i velikih vodozemaca
  - dinosauri preživjeli u velikom broju



## **Mineralne sirovine**

- ugljen: Ural, Apalači,istočna Australija, Afrika, Kina, Indija, Indokina
  - sol: Njemačka, Sj. Amerika
  - nafta: Bliski Istok
  - bakar: Aljaska, Kalifornija
  - željezo: Vareš (Bosna)
  - olovo i cink: Mežica (Slovenija)
  - živa: Idrija (Slovenija)

