# RUKAVAC

EGZOTIČNI KUTAK OTOKA VISA

EXOTIC CORNER OF THE ISLAND OF VIS

unesco
Global Geopark

Geopark
Viški
Arhipelag

# RUKAVAC

EGZOTIČNI KUTAK OTOKA VISA

EXOTIC CORNER OF THE ISLAND OF VIS

FOND ZA ZAŠTITU OKOLIŠA I ENERGETSKU UČINKOVITOST

unesco
Global Geopark

Geopark
Viški
Arhipelag

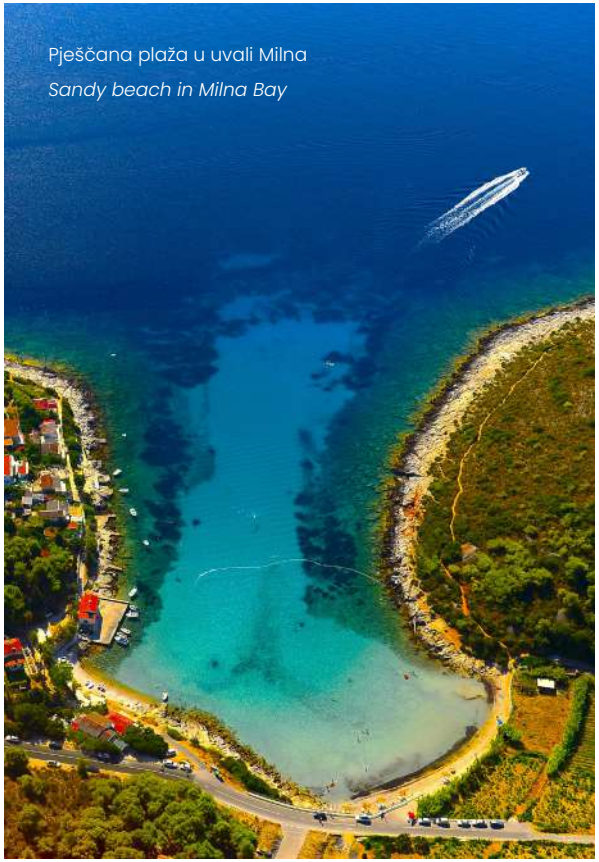
# Zajedno čuvamo okoliš

Sufinancirano sredstvima Fonda za zaštitu okoliša i energetsku učinkovitost

OVAJ JE DOKUMENT IZRAĐEN UZ FINANCIJSKU PODRŠKU FONDA ZA ZAŠTITU OKOLIŠA I ENERGETSKU UČINKOVITOST. SADRŽAJ OVOG DOKUMENTA U ISKLJUČIVOJ JE ODGOVORNOSTI GEOPARKA VIŠKI ARHIPELAG I NI POD KOJIM SE UVJETIMA NE MOŽE SMATRATI KAO ODRAZ STAJALIŠTA FONDA ZA ZAŠTITU OKOLIŠA I ENERGENTSKU UČINKOVITOST.

Arhipelag Rukavca

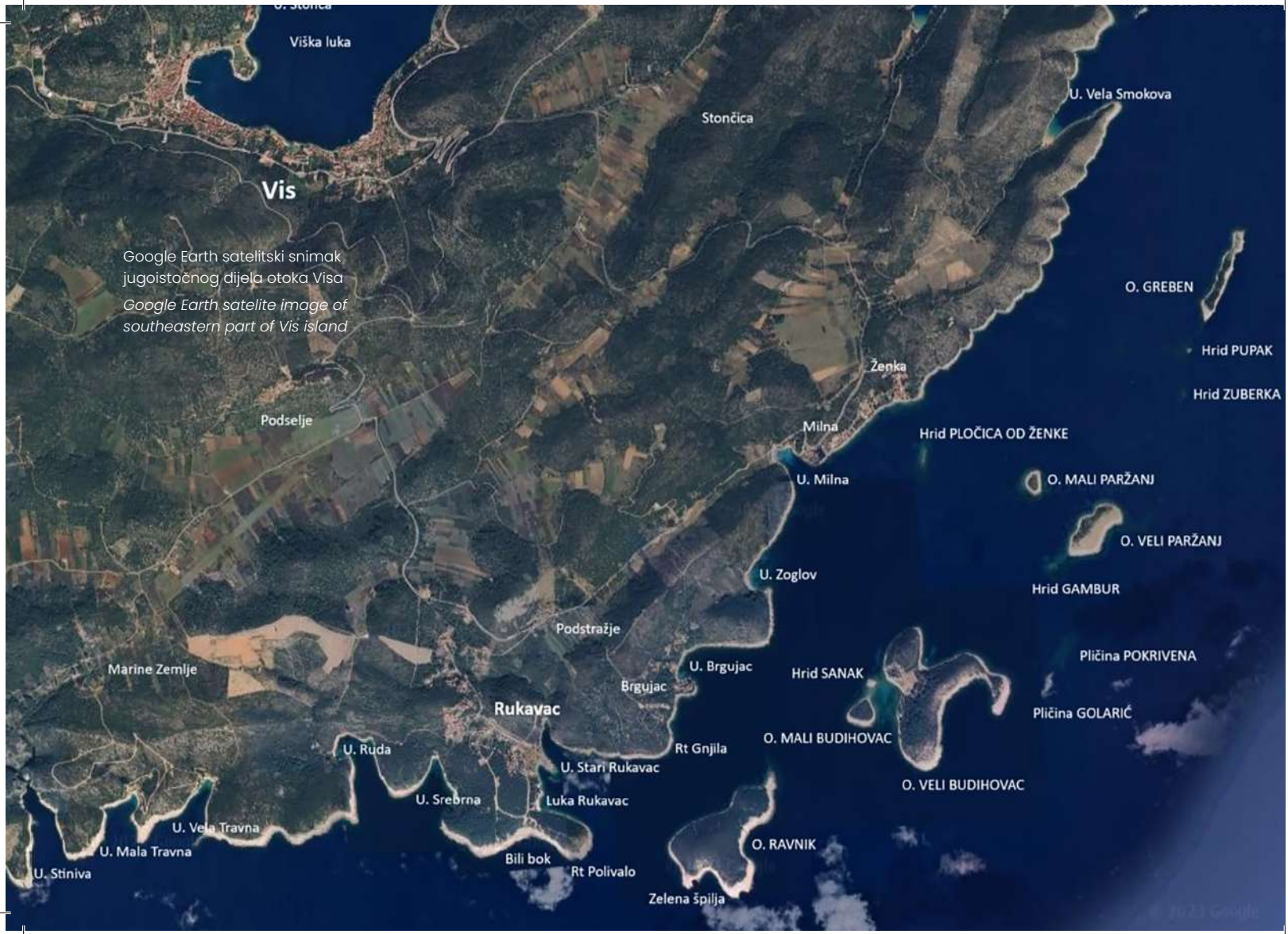
*Rukavac Archipelago*



Pješčana plaža u uvali Milna
*Sandy beach in Milna Bay*

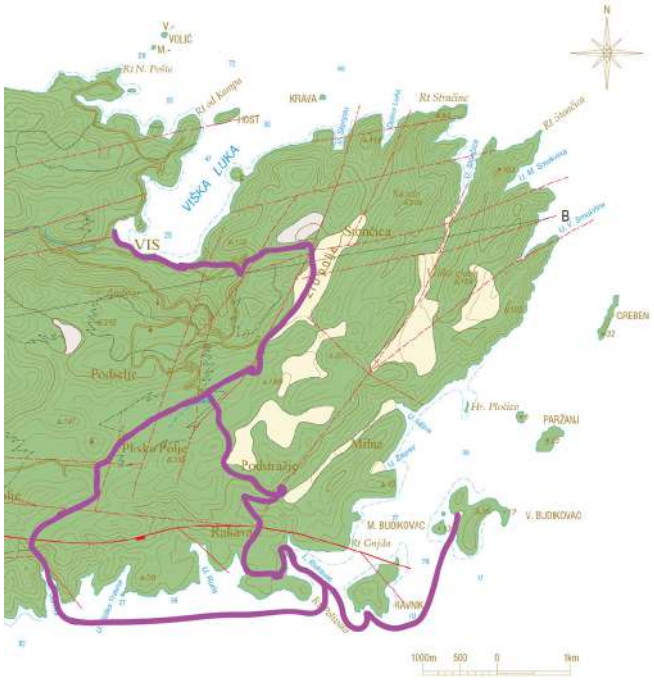
Osim toplog, kristalno čistog mora i bogatog morskog života, ovaj egzotični mali arhipelag nudi obilje geoloških i geomorfoloških atrakcija. Stjenovite obale izgrađene su od vapnenca nastalog na dnu pradavnog tropskog mora. Brojni fosili koji se nalaze u slojevima tih sedimentnih stijena nude jedinstveni doživljaj pradavnog morskog okoliša, posebice tisuće ljuštura rudista – izumrlih školjkaša iz doba dinosaura. Nakon tektonskog izdizanja, karbonatne stijene postale su podloga za taloženje eolskog pijeska tijekom zadnjeg ledenog doba. Podizanjem razine mora nastale su brojne pješčane, šljunčane i stjenovite uvale te morske špilje, a taj proces traje i danas.

*In addition to warm, crystal-clear sea and abundant marine life, this small egzotic archipelago offers plenty of geological and geomorphological attractions. The rocky shores are built of limestone formed at the bottom of an ancient tropical sea. Numerous fossils found in beds of the sedimentary rocks offer a unique experience of the ancient marine environment, and especially thousands of rudist shells — extinct bivalves from the age of dinosaurs. After the tectonic uplift, carbonate rocks became the substrate for the deposition of aeolian sand during the last ice age. Rising sea levels created numerous sandy, pebble and stone beaches, sea caves and unique bays, and this process continues today.*




Google Earth satelitski snimak jugoistočnog dijela otoka Visa

*Google Earth satelite image of southeastern part of Vis island*




**Kvartar:** eolski pijesci
***Quaternary:*** *Aeolian sand*

**Gornja kreda:** vapnenac i dolomit
***Upper Cretaceous:*** *limestone and dolomite*

rasjedi
*faults*

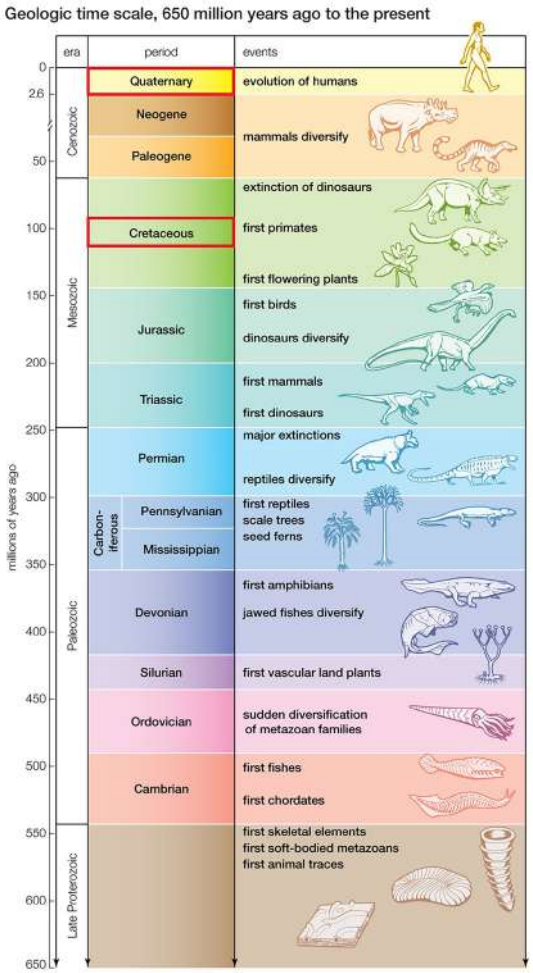
Geostaza Vis-Rukavac
*Vis-Rukavac Geotrail*

Pojednostavljena geološka karta istočnog dijela Visa s geostazom Vis-Rukavac

*Simplified geological map of the eastern part of the Vis island with Vis-Rukavac geotrail*

Jugoistočni dio otoka Visa krasi prekrasan mali arhipelag oko mjesta Rukavac. Rt Polivalo i otočić Ravnik zatvaraju ga s juga, a otočići Budihovac, Paržanj i Greben sa istoka. Zajedno s uvalama Ruda, Srebrna i Stiniva, ovaj arhipelag morski je dio geostaze Vis–Rukavac UNESCO Geoparka Viški arhipelag.

*The southeastern part of the island of Vis is decorated by a beautiful small archipelago around the village of Rukavac. Polivalo cape and the islet of Ravnik protect the archipelago from the south, while the islets of Budihovac, Paržanj and Greben protect it from the east. Along with Ruda, Srebrna, and Stiniva coves, the archipelago is a maritime part of the Vis–Rukavac Geotrail of the Vis Archipelago UNESCO Global Geopark.*




Pregledni slijed evolucije živih bića na Zemlji tijekom geoloških razdoblja

*Overview of the evolution of life on Earth through geological ages*

Prije 90-ak milijuna godina, tijekom kasne krede (Cretaceous), krajem doba dinosaura – mezozoika (Mesozoic), područje otoka Visa bilo je smješteno u tropskom pojasu usred pradavnog oceana Tetisa, na malom mobilnom kontinentu između Afrike i Europe nazvanom Jadranska mikroploča ili Adrija.

*Around 90 milion years ago (late Cretaceous), at the end of dinosaur's era – Mesozoic, the area of the island of Vis was located within the ancient Tethys Ocean, on a small mobile continent between Africa and Europe, called Adriatic microplate or Adria.*

Paleogeografska skica položaja Jadranske karbonatne platforme (ACP) i današnjeg otoka Visa (crvena strelica) prije 66 milijuna godina:

*Paleogeographic sketch-map of the Adriatic Carbonate Platform (ACP) and te presentday island of Vis position (red arrow) 66 milion years ago:*

Google Earth satelitski snimak Bahama

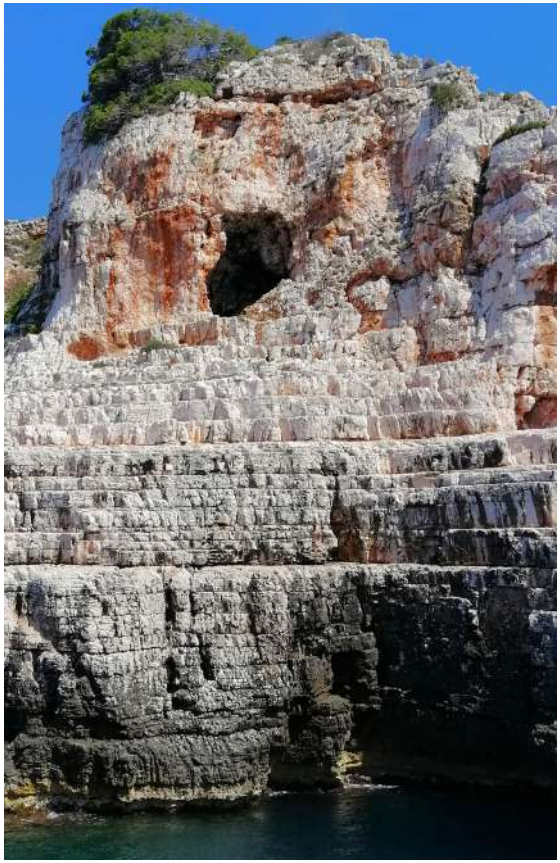
*Google Earth satelite image of the Bahamas*

Današnja Dalmacija bila je zaravnjeno područje nazvano Jadranska karbonatna platforma (ACP), prekrivena plitkim toplim morem i niskim pješčanim otočićima s tropskim raslinjem, poput današnjih Bahama. Svijetle vapnenačke stijene koje grade obale otoka nastale su okamenjivanjem (litifikacijom) pijeska i mulja istaloženog na dnu tadašnjeg toplog plitkog mora, nastalog uglavnom od sitnijih (mikrofoslila) ili krupnijih (makrofosila) karbonatnih skeleta organizama koji su u tom moru živjeli. Postupnom izmjenom kemijskog sastava i mikrostrukture izvornih vapnenaca nastali su sivi dolomiti koji grade jezgru otoka.

*Present-day Dalmatia was a flat area called the Adriatic Carbonate Platform (ACP), covered with a shallow warm sea and low sandy islands with tropical plants, like today's Bahamas. Bright limestone rocks were formed by lithification of sand and mud deposited at the bottom of the warm shallow sea, originated from smaller (microfossils) or larger (macrofossils), i.e. carbonate skelets of the organisms that once lived in the tropical sea. Grey dolomite rocks originated from gradual changing of the chemical composition and microstructure of the original limestone, and today form the core of the island.*

Slojevi vapnenca na južnoj obali otoka Visa

*Limestone layers on the southern Vis island coast*



Slojevi stijena naslagani su jedan na drugi u nekoliko kilometara debelu kamenu tortu, koja je uslijed dugotrajnih tektonskih procesa u kenozoiku (Cenozoic) deformirana i erodirana pa se danas na južnim obalama Visa nalaze naslage blago položenih ploča (geoloških slojeva) koje pripadaju južnom krilu jednostavne velike antiformne strukture otoka Visa.

*The rock layers were stacked on top of each other, forming a several kilometers thick "stone cake". The cake has been deformed and eroded during Cenozoic due to long-term tectonic processes, so the southern shores of Vis are nowadays built of slightly inclined stacked slabs (geological layers) of bright limestone belonging to the southern limb of the simple large antiform structure of the island of Vis.*

Slojevi vapnenca na južnoj obali otoka Visa

*Limestone layers on the southern Vis island coast*

Rudistni vapnenac na Bilom boku

*Rudist limestone at Bili bok*

Južne obale otoka Visa izgrađene su uglavnom od vapnenaca izgrađenih od čistog života, čemu svjedoče spektakularne nakupine rudista, najbrojnijih velikih plitkovodnih fosila koje nalazimo u stijenama Jadranske karbonatne platforme iz razdoblja kasne krede. Rudisti su školjkaši neobičnih oblika koji su izumrli zajedno s dinosaurima zbog udara asteroida prije 66 milijuna godina. Rudisti su u doba krede (Cretaceous) mjestimice doslovno gradili stijene pa danas njihove karbonatne ljušture nalazimo u velikim množinama u stijenama.

*The southern coast of the island of Vis is thus built mainly of limestone originated from a pure life, as evidenced by spectacular clusters of rudist shells. Rudists are the most numerous large shallow-water fossils in deposits of the Adriatic Carbonate Platform during the late Cretaceouse. Rudists are extinct bivalves of bizarre shapes, which disappeared from the Earth along with the dinosaurs because of the impact of an asteroid 66 million years ago. In the Cretaceous period, rudists were lithogenic elements, which means that their carbonate shells ocasionally builtrocks.*

Nakupina fosila gornjokrednih rudista u uvali Srebrna

*Accumulation of Upper Cretaceous rudist fossils in Srebrna*

Rt Polivalo

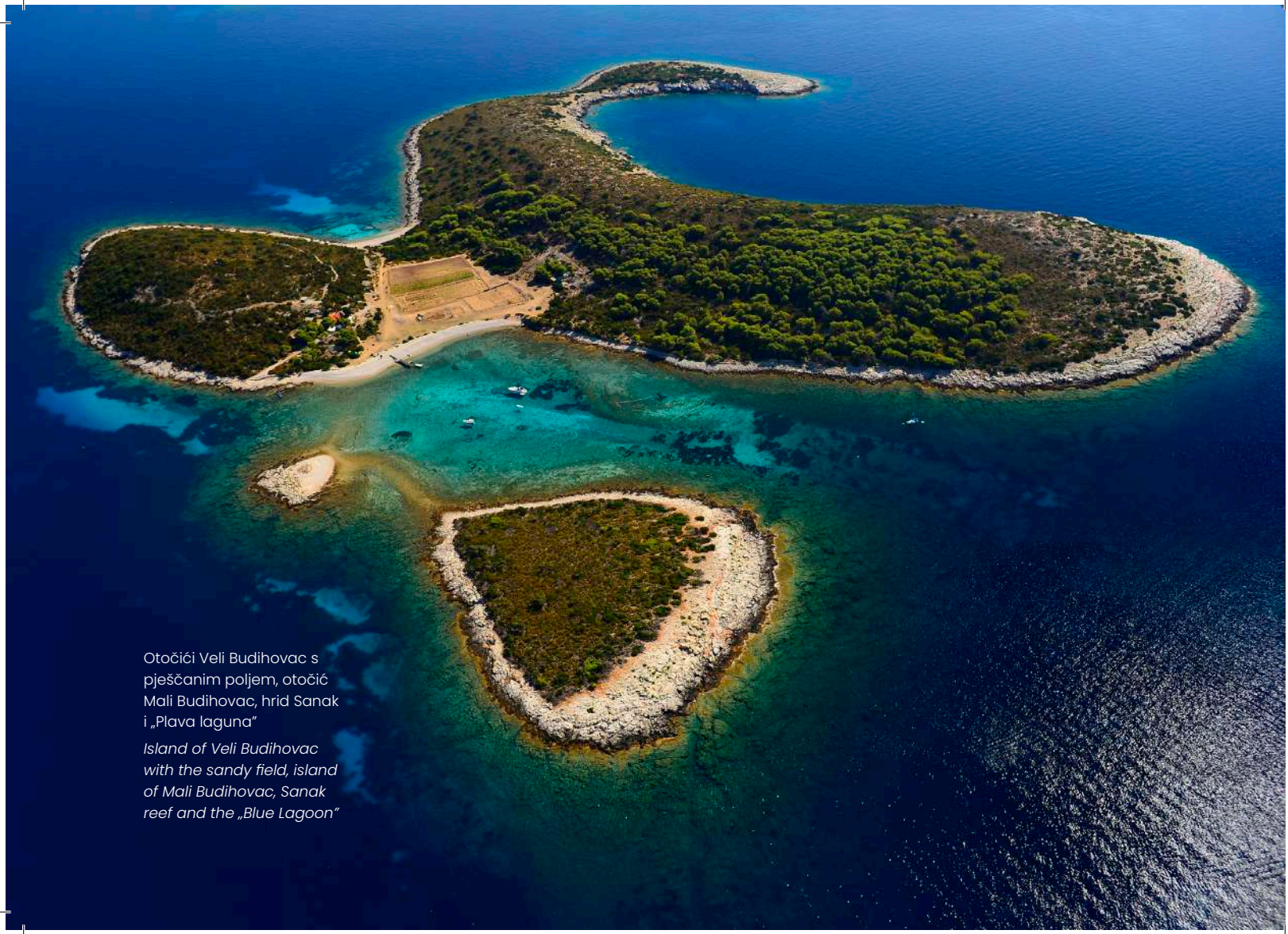
*Polivalo Cape*

Bili Bok na rtu Polivalo
*Bili Bok at Polivalo Cape*

Napušteni kamenolom rudistnog vapnenca na Bilom boku
*Abandoned rudist limestone quarry at Bili bok*

Spektakularne nakupine fosila rudista nalazimo na rtu Polivalo, na lokalitetu Bili bok. Na Bilom boku napušteni je kamenolom bijelog vapnenca koji je služio za izgradnju kuća u Rukavcu i Visu. Vapnenac je u najvećoj mjeri izgrađen od nakupina ljuštura rudista koji se promatranjem iz blizine mogu pregledavati do najsitnijih detalja.

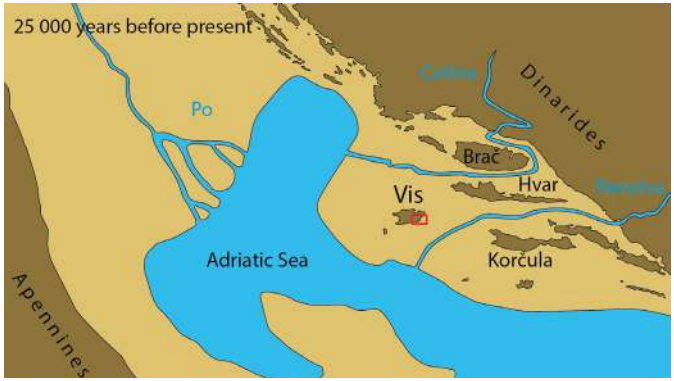
*The most spectacular accumulations of rudist fossils are found on Cape Polivalo, at the Bili bok locality. At Bili bok there is an abandoned white limestone quarry. The limestone was used to build houses in Rukavac and Vis. Limestone is mostly made up of rudist aggregates, which can be examined up close to the smallest details.*



Otočići Veli Budihovac s pješčanim poljem, otočić Mali Budihovac, hrid Sanak i „Plava laguna"

*Island of Veli Budihovac with the sandy field, island of Mali Budihovac, Sanak reef and the „Blue Lagoon"*

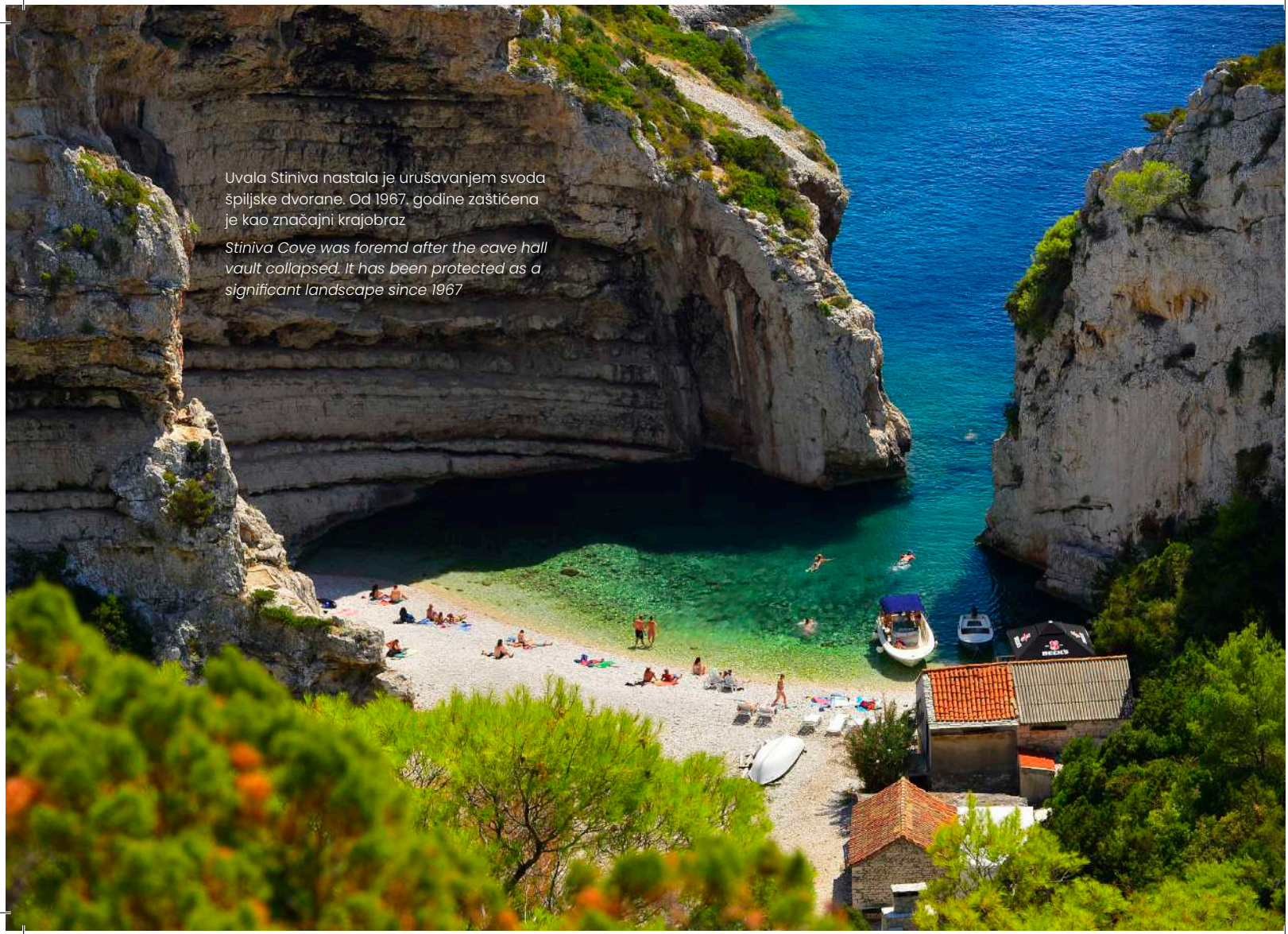
*Pješčana polja u zaledu Rukavca*
*Sandy fields in the hinterland of Rukavac*




Krajem zadnjeg ledenog doba, prije 25 000 godina, razina mora bila je oko 120 metara niža nego danas pa su današnji otoci bili brda usred Jadranske stepe. Snažni vjetrovi napuhivali su pijesak sa stepe na brda pa su tim eolskim procesom (po grčkom bogu vjetra – Eolu) zapunjavane doline i stvarana pješčana polja koja su danas plodna podloga za brojne nasade.

*At the end of the last Ice Age, 25,000 years ago, the sea level was about 120 meters lower than today, and the present-day islands were hills in the middle of the Adriatic steppe. Strong winds blew the sand from the steppe to the hills, so with this aeolian process (named after the Greek od of wind — Aeolus) the valleys were filled and sand fields were created, which today are fertile ground for numerous plantations.*

Paleokarta srednjeg Jadrana krajem zadnjeg ledenog doba
*Central Adriatic paleomap at the end of the last Ice Age*



Uvala Stiniva nastala je urušavanjem svoda špiljske dvorane. Od 1967. godine zaštićena je kao značajni krajobraz

*Stiniva Cove was foremd after the cave hall vault collapsed. It has been protected as a significant landscape since 1967*

Stiniva tijekom ledenog doba, prije urušavanja svoda špilje

*Stiniva during the Ice Age, before cave hall vault collapsed*

Uvala Stiniva danas, nakon urušavanja svoda špilje

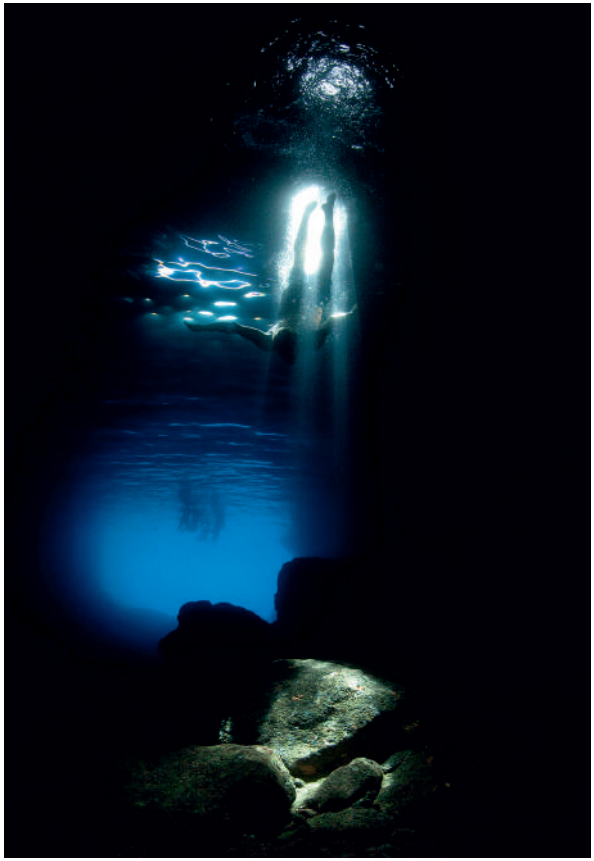
*Stiniva Cove today, after cave hall vault collapsed*

Otapanje vapnenca uzrokovano procjeđivanjem kišnice (okršavanje) dosezalo je veće dubine u površinskom dijelu Zemljine kore. Voda se slijevala iz unutrašnjosti brda (današnjeg otoka) po nepropusnim dolomitima, dubeći kanjone i špilje na svom putu. Špilje su se kasnije urušavale zbog otapanja karbonatnih stijena pri površini. Podizanjem razine mora nakon ledenog doba preplavljeni su kanjoni i krške špilje, čime su nastali najljepši priobalni geomorfološki oblici na Jadranu.

*The dissolution of limestone by rainwater (karstification) reached deeper into the surface layer of the Earth's crust. Water poured from the interior of the hill (today's island), deepened canyons and caves, which later collapsed due to the dissolution of carbonate rocks near the surface. The rising sea after the Ice Age flooded the canyons and karst caves, yielding the most beautiful coastal geomorphological features of the Adriatic.*

Zelena špilja proglašena je 1967. godine geomorfološkim spomenikom prirode a otočić Ravnik značajnim krajobrazom

*In 1967 the Green Cave has been declared a geomorphological monument of nature and the island of Ravnik a significant landscape*



Zelena špilja na otočiću Ravniku primjer je današnjeg procesa urušavanja stropa jedne polupotopljene špilje. Zbog sunčevog svjetla koje se kroz malu rupu u stropu probija kroz špiljsku tamu, ova špilja privlači brojne turiste. Olujni valovi tijekom zimskog perioda udaraju u špilju i odlamaju blokove stijena pa se u budućnosti očekuje daljnje urušavanje stropa špilje i stvaranje žala od urušenog materijala.

*Green Cave on the island of Ravnik is an example of the ongoing collapse of the ceiling of a semisubmerged cave. Due to the sunlight that breaks through the cave's darkness through a small hole in the ceiling, the cave attracts many tourists. Storm waves hit the cave during the winter period and break off blocks of rock, so in the future a complete collapse of the cave ceiling and the formation of a beach from the collapsed material is expected.*

Zelena špilja na otočiću Ravniku

*The Green Cave on the Ravnik island*

Panoramski pogled na arhipelag Rukavca otkriva brojne zanimljve otočiće i uvale nastale uslijed podizanja razine mora nakon otapanja leda, koje je započelo prije dvanaest tisuća godina, a traje još i danas

*A panoramic view of the Rukavac archipelago reveals numerous interesting islets and bays created because of the rise in sea level after the melting of the ice at the Earth's poles that started a dozen thousand years ago, which continues today*

Za razliku od ljetne idile, ovdje se može osjetiti i snaga velikih valova koji tijekom zimskih oluja tuku stjenovitu obalu na isturenim južnim pozicijama. Ta snaga se vidi na ispranim priobalnim stijenama do visine od 15 m, ali i na nakupinama olujnih blokova koje ekstremni valovi nabacuju i do 50 metara od obalne linije.

*In contrast to the summer idyll, here you can also feel the power of the big waves that hit the rocky coast in the southern positions during winter storms. This power is visible on the washed coastal rocks up to a height of 15 m, but also on the accumulations of storm boulders that the extreme waves throw up to 50 meters from the coastline.*

Olujni blokovi na rtu Polivalo

*Storm boulders at the Polivalo Cape*

**Izdavač / Publisher**

Geopark Viški arhipelag

Hrvatskih mučenika 17

21485 Komiža

**www.geopark-vis.com**

Vis Archipelago Unesco Global Geopark

@UnescoVis

@vis_archipelago_geopark

unesco
Global Geopark

Geopark
Viški
Arhipelag

**Autor teksta / Author**

Tvrtko Korbar (Hrvatski geološki institut)

**Urednik / Editor**

Filip Prelec (Geopark Viški arhipelag)

**Autori fotografija i ilustracija / Photography and illustration by**

Ivo Pervan

Matko Petrić

Tvrtko Korbar (Hrvatski geološki institut)

Filip Prelec (Geopark Viški arhipelag)

Krešimir Petrinjak (Hrvatski geološki institut)

Pero Vojković (P3R0)

**Ostali izvori / Other sources**

http://kids.britannica.com/comptons/art-107857/The-geologic-time-scale-showing-major-evolutionary-events-from-650

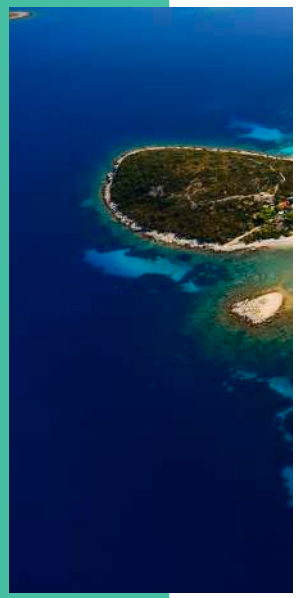
Google Earth

**Dizajn / Design**

Ivana Kevo

unesco
Global Geopark

Geopark
Viški
Arhipelag



POSJETITE PODRUČJE RUKAVCA SMJEŠTENOG NA KRAJU POSTOJEĆE GEOSTAZE VIS – RUKAVAC I DOŽIVITE OVAJ EGZOTIČNI KUTAK UNESCO GLOBALNOG GEOPARKA VIŠKI ARHIPELAG U SVOM PUNOM GEOLOŠKOM I GEOMORFOLOŠKOM SJAJU.

VISIT RUKAVAC ARCHIPELAGO LOCATED AT THE END OF THE EXISTING VIS – RUKAVAC GEOTRAIL AND EXPERIENCE THIS EXOTIC CORNER OF THE VIS ARCHIPELAGO UNESCO GLOBAL GEOPARK IN ITS FULL GEOLOGICAL AND GEOMORPHOLOGICAL GLORY.