

Organic climbing, surveying and exploring terrain fit for climbing and the subjective experience of climbing

GEJZA MIKULÁŠ TIMČÁK¹ and LADISLAV VIZI²

¹ *Institute of Geotourism, Technical University in Košice, Letná 9, 042 00 Košice, Slovakia
(E-mail: gejza.timcak@tuke.sk)*

² *Institute of Geosciences, Technical University in Košice, Letná 9, 042 00 Košice, Slovakia
(E-mail: ladislav.vizi@tuke.sk)*

ABSTRACT

Geotourism is experientially a very rich field. One of its parts is a “soft” climbing at geotourist sites, called organic climbing. It is a type of mountaineering that goes back to the older tradition of climbing with minimum of technical gears and with the aim of enjoying interaction with nature and the natural scenery. It is not driven by a desire to scale a mountain by its technically most demanding routes, but through a way that leaves the mountain in its original state (without pitons, bolts, rivets or other technical devices and litter left in or under the wall) and gives the climber a state of aesthetic and kinetic comfort. Thus it is the process, which is important and not so much the goal. As the search for suitable sites is not always easy, the paper describes also modern strategies and procedures for defining suitable terrains that conform to the required criteria. They include the use of satellite imagery, digital maps, GIS and in some cases geostatistics.

Key words: organic climbing, geotourism, GIS

INTRODUCTION

Geotourism has more than one definition and thus has many aspects. One of the geotourism types is exploratory in character and deals with enjoying rock outcrops, rock domes, boulders, rock faces, gorges, peaks or caves from a distance or by walking tours, by taking a cable car or airlift. Climbers are a special subset of geotourists. Rock climbing has many forms nowadays, like top-ropeing, lead-climbing, aid climbing, sport climbing, bouldering, free climbing, free soloing, deep water soloing, scrambling, rope-soloing, mixed climbing, simul climbing or traditional climbing (www.1).

The goal of usual rock climbing is to reach the summit of a formation or the endpoint of a pre-defined route. Rock climbing uses legs and hands to support the climber's weight as well as to provide balance.

Solo climbing is not recommended in many countries (including Slovakia), though in some areas it is tolerated in spite of the increased probability of accidents, which can be lethal.

The present trend of taking mountaineering and climbing as a challenge for overcoming more and more difficult ways to climb mountains and rocks has virtually no end. Depending on the amount of skill and technical aid, breath-taking routes can be scaled.

Nevertheless, the training for such demanding sport tasks focuses on the goal to conquer, not on going along with nature. Thus climbing has become a goal driven sport, not a process driven one. The accident risk is presently higher than it used to be, in spite of the development of a number of gears and techniques that can lower the risk of injury if properly used.

The presented way of organic climbing reflects a need for coming to a closer

contact with the organic part of the nature. It is a process-oriented type of sport, where the experience of becoming a part of nature and going along with it is more important than a goal (like reaching the summit through a given path). This means that the routes could be trivial from climbing point of view and scaring from the point of view of tourists. This is because the choice of route would deliberately lead mainly through partly vegetated areas, where the proportion of bare rocks to vegetated areas could be 1:1 (see e.g. Figs 3, 8, 9) or less. The added difficulty lies in the weathered/fragmented state of the rock at such localities, the fragility of the grass cover or tree trunk/branch/root that could be used as an additional support. In case of winter tours, the climber should chose only paths that were assessed at times when the terrain was not covered by snow. He should not cause breaking ice forms or cause wider disturbance of snow layers.

The aim is to choose a path that is beautiful, exposed to the degree fit for the organic climber's competence and that can be scaled/climbed without any technical gear – except for those mentioned below.

PHILOSOPHY OF CLIMBING

Philosophy of climbing is a complex issue. At the beginnings the philosophy seems to have been “as the mountains and rocks are there, they should be explored”. When the exploration period was over, the next part of the philosophy of climbing was to find different routes of reaching the summit. Next comes, the quest for “fighting through” more and more demanding routes. As complexity and difficulty grew, more and more technical gears were developed. Finally, a variety of climbing styles developed that are suitable for different types of climbing achievements. Each one has its own working philosophy. In 2009 a call for abstracts for a book on climbing philosophy by S.E. Schmid gave the subject areas listed below for consideration. His

points are used for developing the subject.

1. *Metaphysics and Spiritual aspects:* When reflecting on the link between climbing and the meaning of life we can see that there is an element of “Zen” in climbing. The magnificence of mountains can aid finding a link to a higher principle or spirituality. Perhaps this is why mountains are considered sacred since time immemorial. Further, even in case of great care, accidents may happen and the life of the climber may be terminated. Thus the potential closeness of death may add to the transcendental aspects of climbing. Help may be available and thus even the very self-reliant climbers have to learn to call for- or accept help. The mountaineering experience can teach us therefore how to lead a good/just life;

2. *Sport:* It is an open question what is the source of *purity* in the sport of climbing. Dangerous sports tend to lead to self-affirmation; getting down alive is the only finish line. To some, climbing competitions pervert the purity of climbing. The emphasis on “owning” first ascents raises the question, whether this is the true adventure. Here one can also reflect on the question, whether performance enhancing drugs are compatible with climbing, as they enable to achieve more than we are built for.

3. *Ethics:* There is a question, whether high-risk sports are ethical, as they put the life of the climber at risk and in case of injuries, tax the medical care system more than others do. Climbing can be seen also as a means of developing the Cardinal Virtues (prudence, justice, restraint / temperance, and courage). It is also a question to what degree should one put one's health or integrity at risk in case it is needed to help a fellow climber. A misjudged help effort may bring more casualties. Climbing teaches to trust in one's climbing partner. Further, when guiding one through a climbing tour, it is

important to decide, whether it is a responsibility of a climbing guide to protect climber's safety or yield to the pressure for successfully reaching the summit.

4. Death & Dying: As mentioned, living with the remembrance of possible death is very palpable in case of climbing; Grief and affirmation stays with us, when a friend is injured or terminally injured in climbing. It is a question; whether it is just, to motivate oneself to continue climbing after witnessing a climbing fatality. The climber is like Sisyphus – no matter how much did he achieve, he feels that he has to achieve more. This usually leads to an untimely death of many excellent climbers.

5. Aesthetic: Rock climbing, when mastered, has a strong relationship to the aesthetics of movement; The beauty of a fine line/crack/route or mountain is causing joy to the climber even if he sees them only as a means to achieve victory over the summit. Rock climbing can give an aesthetic experience to those who are comfortable with the challenges. Outdoor climbing – if we do not have to focus solely on our climbing – brings great aesthetic experience stemming from admiring nature around us.

6. Psychological: Climbing necessitates undertaking risk. In order to keep the risk at a reasonable level, one has to have a good level of self-knowledge. Climbing on the other side includes also the effort to risk aversion. When climbing, one has to be and live - in the present moment. When the right climber climbs the right route under right conditions, then he may experience the flow as defined by M. Csikszentmihályi in „Flow: The psychology of optimal experience“, N. York, Harper, 1990. Climbing – even if done in pairs, needs a strong sense of self-reliance. The hardships that are to be overcome help the character development of a climber. Awareness of the limits of self in comparison to nature could make one humble and willing to accept the

fact that nature is mighty and we are weak regardless our physical strength. As regards phenomenology of climbing, we can say that the intrinsic value of climbing is in its enabling to conquer difficulties, to cross over our shadow, to come to a better understanding of nature and of ourselves, just as to come to know the value of other human beings. A philosophical reflection on the needs in climbing may lead to the realization that having less (technical aids) may be more. A nice example is given by Henry Barber, who climbed barefoot, without chalk, in Eastern Europe in the 1970s, with knotted slings (instead of high-tech pro — gear), that he still uses: *“Climbing these great routes in a minimalist style made me realize I could accomplish much more with less in all areas of my life.... Climbing is the only place in my life where I experience true simplicity.... the goal was to always have a day where I wasn't sure of the outcome”* (www.2)

7. Gender: In climbing, nowadays there is gender equality; Women often show a better understanding of the values of climbing than men. Lynn Hill, in her book *Climbing Free* declared that rock climbing, for her, has become *a vehicle for evolving as a person, learning about the world, and sharing those experiences with others.* (www.2). This is very much the same process also for men.

8. Environmental: Climbing may or may not be green, depending on the climbing culture. The problem is when the climber alters the environment (e.g., bolting, climber's trails and pollution). Modern climbing is still an expression of human desire to dominate nature, in spite of the general shift towards emphasizing synergy with nature.

9. Cultural: Climbing can adjust to many cultural systems. When properly understood, it develops the culture of self-knowledge, understanding of others as well

as of nature. Climbing can develop strong bonds and co-dependencies. The solidarity of climbers is often very strong. Usually it is true especially in high altitude climbing. In high mountains the Sherpa mountain culture can mean the reliance on support of people willing to support.

CULTURAL AND ENVIRONMENTAL ETHICS OF CLIMBING

To elaborate more on wider aspects of ethics, we will consider also less technical issues. Thus some areas that are popular for climbing are also sacred places for local people (like Mount Athos in Greece, Mt. Kailash in the Himalayas, Arunachala in S. India, Uluru in Australia, etc.) and thus it is against their culture to sport in that area. Many indigenous people would prefer that climbers do not climb these sacred places and have made this information well known to climbers. In other areas the rocks may be a part of protected territory where climbing is not tolerated.

Climbing can also interfere with raptor nesting, since the two processes often take place on the same cliffs. Land managers in many climbing areas institute nesting season closures of cliffs known to be used by protected birds of prey like eagles, falcons and osprey or other protected birds.

Although many climbers adhere to "minimal impact" and "leave no trace" practices, rock climbing is sometimes damaging to the environment. Common environmental damages include: soil erosion, chalk accumulation, litter, abandoned bolts and ropes, human excrement, introduction of foreign plants through seeds on shoes and clothing or food, and damage to native plant species, especially those growing in cracks and on ledges as these are often intentionally removed during new route development through a process commonly referred to as *cleaning*. All this is to be avoided in organic climbing.

Clean climbing is a style of rock climbing

which seeks to minimize some of the aesthetically damaging side effects of some techniques used in traditional climbing and more often aid climbing, by avoiding using equipment such as pitons, which damage rock. Thus clean climbing is in some aspects close to organic climbing (www.1).

PSYCHOLOGICAL ASPECTS OF ORGANIC CLIMBING

Organic climbing should bring back climbing moods, where there is time for enjoying the landscape, taking photographs or painting aquarelles (Fig.1). The aesthetic experience of such climbing has a healing effect.

This was in fact one of the ideas that were propagated by the old Slovakian Alpinist Association – the IAMES, one of the founding members of UIAA (www.3) – established in 1921. This acronym stands for *Idealism, Alpinism, Morality, Eugenics and Solidarity*. Before the W.W.2nd, the Idealism was taken as a philosophical concept. After the Communist takeover in 1948, the organization was banned, but it was re-established after 1989. Now, idealism is taken as a psychological concept and Eugenics is replaced by Enthusiasm. Organic climbing is not tied to any specific ideology, but the principles of IAMES fit its needs very well. Bringing back experiential aesthetics during organic climbing, enjoying the co-existence of rocks and vegetation and all the aesthetic expressions of life-forms along the route has a great value to humans in this ever accelerating world that is obsessed by competition and an achieving spirit. In usual types of climbing situations, the aesthetics is appreciated mainly by third parties who take photographs or film the climbing. For a few moments, it appears also at the summit before descent. Looking through a viewfinder is, however a different experience than enjoying the climbing and the environment in which it occurs.

RECOMMENDATIONS FOR ORGANIC CLIMBERS

Thus organic climbing is a style, where a geotourist site of partially vegetated rocky type is climbed without technical aids, leaving virtually no impact on nature. It is done in a way that enables a safe and unhurried experiencing of the climbing and nature. The process of defining suitable terrains is given in the following paragraph. The organic climber should not use technical gears apart from harnesses, helmets, karabiners, belay, slings and rope in summer. In winter, axe and crampons may be added. The old Tricouni footwear (Fig.2) – after some upgrade - would be better than crampons (www.4), but they are no longer commercially available. The later versions had a rubber inner sole part, that resembled an early version of wibram soles and the metallic „teeth“ were planar and sharp. In Europe they were superseded by Wibram soles, but in the USSR Tricouni type of soles were used up to 1960-es. Trekking poles are helpful. This list may vary according to the nature of the terrain. Harnesses are sometimes more a hindrance than a need as the climbing is usually technically light. The ropes may be attached to the climbers in the classic way. The climber is not allowed to put pitons, bolts or other gears into the rock. The climber should not cause rock falls or destroy vegetation. He (or she) should not disturb nesting birds or other animals. He should behave according to the regulations governing the area where he intends to climb. He should not mark his trail in any way and should not record it apart from a GPS trace, as repeating the same trail is undesirable¹. He can take photographs or take drawings and paintings. The chosen climbing route should not be documented or published in the usual way. All this aims at staying environmental friendly and decrease the environmental impact of the organic climbing.

¹ Undesirable, as repeating the same trail means a greater environmental load along the path.

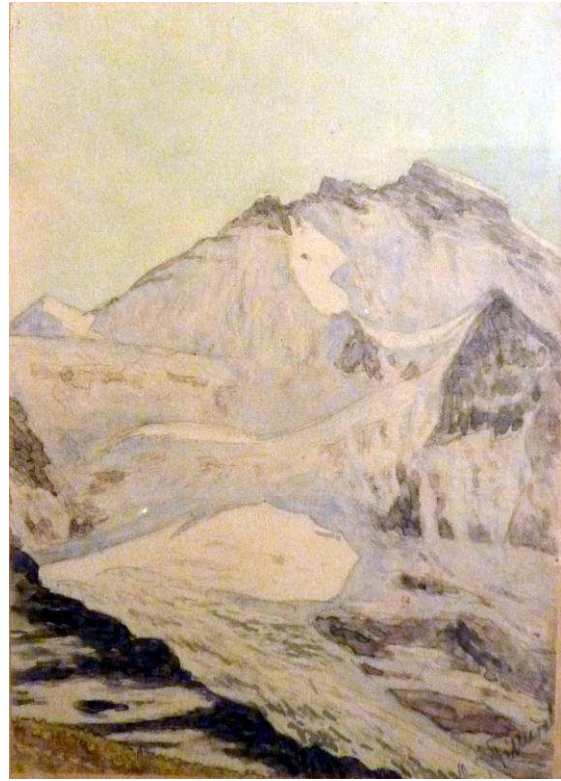


Fig. 1 An aquarelle painted during organic climbing. It depicts the Jungfrau, Jungfrauoch and the Guggi Gletscher from Kleine Scheidegg direction executed in October 1931 by Dr. A. G. Timcsák

SURVEYING AND DEFINING TERRAINS SUITABLE FOR ORGANIC CLIMBING

Organic climbing (OC) is a style that can be practiced in areas, where the rock weathering has produced enough support for vegetation to take roots at certain areas. Ideally, a part of the route goes along steep grass- or tree covered areas. The climber should try to find routes that enable alternating rock climbing and climbing parts covered by vegetation (Figs 4, 7, 9,10). The overall inclination of the slope, the type of vegetation covering the terrain as well as of other important parameters is given in Tab.1. The process of discovery of suitable terrains and routes in areas not previously known to the organic climbers can be done using steps defined in Tab. 2. It can employ satellite imagery, digital maps, GIS and for an in-depth analysis of unfamiliar terrain also geostatistics.



Fig. 2. A pre-1948 model of climbing footwear later improved by Tricouni It was made by a specialised shoemaker Mr. Zsótér in Košice and used by Dr. A. G. Timčák (1910-1962).

Tab. 1 Basic parameters of the terrain suitable for organic climbing.

Parameter/limits	Favourable	Medium	Less favourable
Rock type (examples)	Limestone, dolomite	Granite, basalt, consolidated volcanic sediments	Sandstone, soft volcanic sediments, metamorphic rocks
Degree of weathering	B, C	A,	D
Average inclination of the face in degrees	60-80	50-60	≤50; ≥80
Type of vegetation; land use type	Round-leaved (deciduous) trees + grass	Coniferous trees, shrubs and grass	Grass, moss
Ratio of vegetation free- and vegetation covered part of the slope faces	1:2	1:1	other
Danger from animals (Vertebrate or invertebrate; macro- or microscopic)	Zero or low	medium	Great
Note: The descriptive parameters can be of mixed character (e.g. weathered granite type B and 65-80° slope). Degree of weathering (according to Afrouz 1992): A- microfresh state, B-virtually fresh state, C – stained state, D – partly decomposed state, E – completely decomposed state. Objectively, the state of the rock can be tested by using Schmidt hammer (cf e.g. Basu, Aydin 2004), or by image analysis (Momma et al. 2006).			

APPLICATION OF REMOTE SENSING AND GIS IN SURVEYING AND EVALUATING AN UNFAMILIAR TERRAIN INTENDED FOR ORGANIC CLIMBING

As mentioned above, the discovery of terrains suitable for organic climbing can be greatly aided by satellite images, GIS and

sometimes by geostatistical processes. A general scheme of survey steps is given in Fig.3a. Practically, the first step is to find a suitable locality using maps, digital maps or satellite imagery (e.g. using Google maps). Fig.3b shows the satellite view of a locality suitable for OC, Fig. 4 shows a detail of that area. A ground photo from this area is shown on Fig.10.

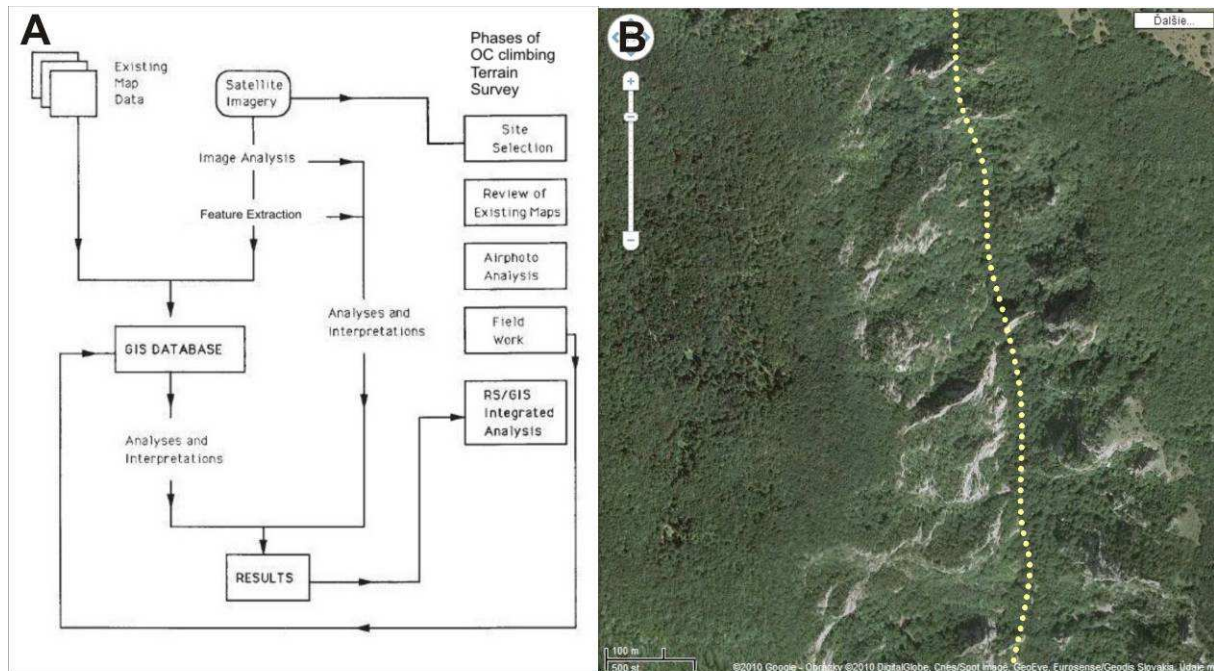


Fig.3A Phases of OC climbing terrain survey using existing maps, remote sensing (RS) and GIS (adapted from Shupe 1990); **B** Satellite image of a gorge suitable for OC (<http://maps.google.sk/>). The dotted line shows the bottom of the valley. A Google earth image would show this in 3D.

First, using a digital map, a polygon of area of interest (*.dgn file) is created over a 1:50 000 scale vector map in a Bentley Microstation 95 environment, using the GeoGIS programme package (Dugacek 1998). This file is then imported into ArcGIS 9 environment. Here, the topography (2D or 3D), geology and land use layers are selected.

In our case, as only 1:50 000 map data were available the basic cell size was 30x30m. This resolution is suitable for large scale features, but is less suitable for our terrain. Nevertheless, it can be used to show the way, how the data needed for analyzing OC terrain can be gained (Figs 5.-8). The geological map (SGU 2000) and CORINE LandCover map (SAZP 2004-2009) together with the topographical map of Slovakia provided the needed basic data.

IN SITU EXPLORING AREAS FIT FOR ORGANIC CLIMBING

After the “behind the table” or computer

based exploration, the results should be verified in the selected terrain. Trying the terrain suitable for organic climbing is a task that every organic climber likes to do. Geographically, suitable terrains can be found on the majority of continents, so the adjustment of the climber should be done accordingly. The height of the goal areas is limited by the height to which vegetation can adapt. In Slovakia (e.g. the Sivec in the Hornád valley, some parts of the Slovak Paradise, the Háj valley, the Zádiel gorge - all in E. Slovakia. Also the High and Low Tarta Mts. and other parts of the North and South segments of the Carpathian range that offer ample possibilities), very nice organic climbing terrains can be found - built by sedimentary and magmatic rocks. Some areas are remote; some attract tourists and rock climbers alike. Organic climbing routes are possible also in the Alps – both in Austria, Italy, France, Slovenia and Switzerland, as well as in other parts of the world. Exploring an area from organic climbing point of view may take a number of months or years, depending on the specific features and size of the area.

Tab. 2 Steps in surveying an unfamiliar terrain

Steps	Geo-morphology	Digital maps	Geology	Land use	Inclination	Image analysis	GIS	Geo-statistics
<i>Preliminary survey</i>	Google maps – satellite imagery (cf. Fig.2,3), Google earth	Definition of an area (polygon) with the desired features	Identification of rock type (using printed geological maps)	Type of vegetation on the basis of printed maps	Manual calculation on the basis of isolines	Manual survey of satellite images	Formulating a GIS project	
<i>General survey</i>	Creating a 3D relief in a GIS environment	Uploading the maps and databases to a GIS	Identification of rock type (using digital geological maps)	Identification of vegetation on the basis of digital maps	Calculation using GIS software, verification in real terrain	Information on the terrain using digital image analysis	Preparing a detailed spatial data report on the selected polygon	Gathering data for geostatistical calculations
<i>Detailed survey</i>	Photographical survey of the selected area		Checking the rock types and degree of weathering in situ.	Personal surveying the terrain and analysis of photographs	Manual control of GIS data on the basis of in situ photo-documentation	Filtering the needed data, on-site matching	In situ verification of data, data corrections	Calculation of geostatistical parameters for in-depth analysis of terrain properties.

Notes:

1. For a general survey a 1:50 000 map is sufficient. For a detailed survey, 1:10 000 maps are needed.
2. For summer and winter separate assessment of terrain is needed. In the example given in this paper, snow covering patterns are not analyzed.
3. Geostatistics can be used e.g. for assessing dangers related to slope instability, assessment of rock homogeneity, risks due to the spatial occurrence and process intensity of malevolent animal species, etc

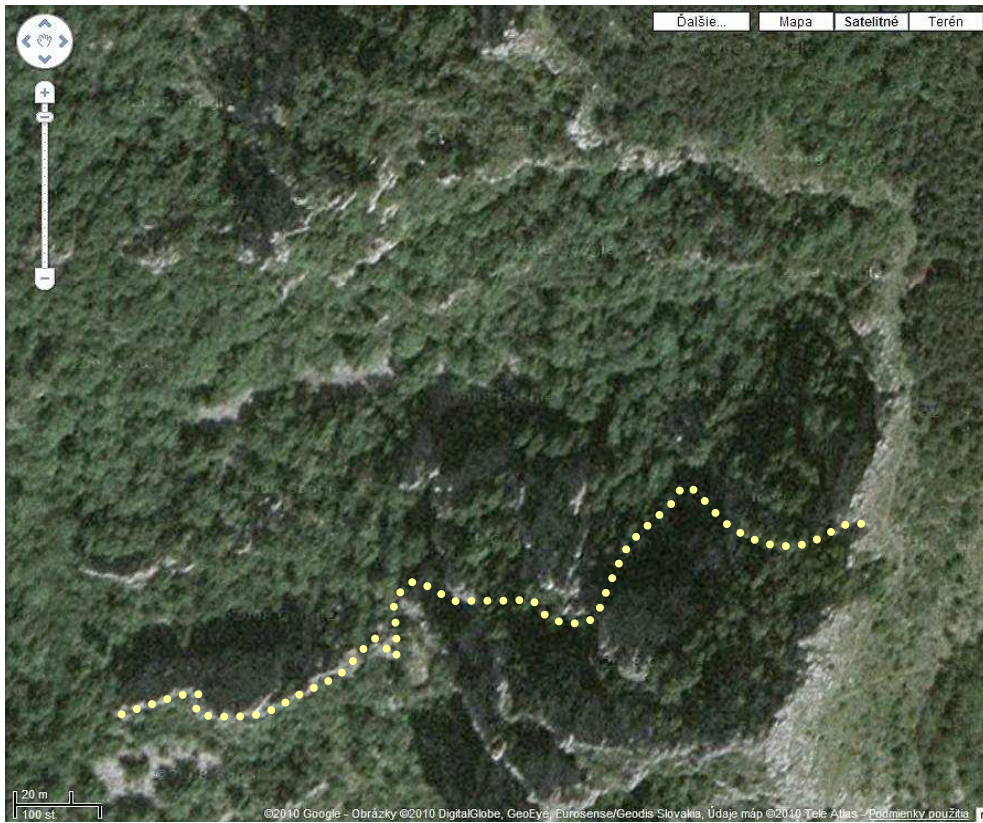


Fig. 4 Detail of a part of the gorge shown in Fig.2 (<http://maps.google.sk/>). The dotted line shows a possible OC route. A ground photograph is given in Fig. 10.

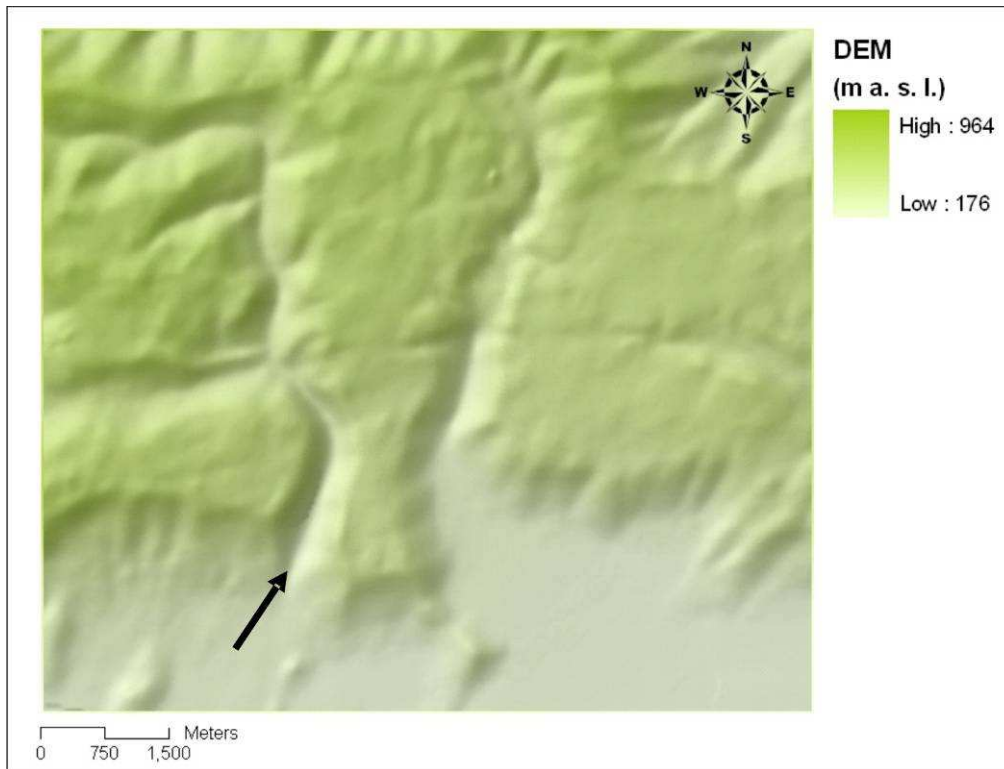


Fig. 5 Digital elevation model (DEM) of the selected area (m a. s. l. – metres above sea level). The arrow points to the selected gorge.

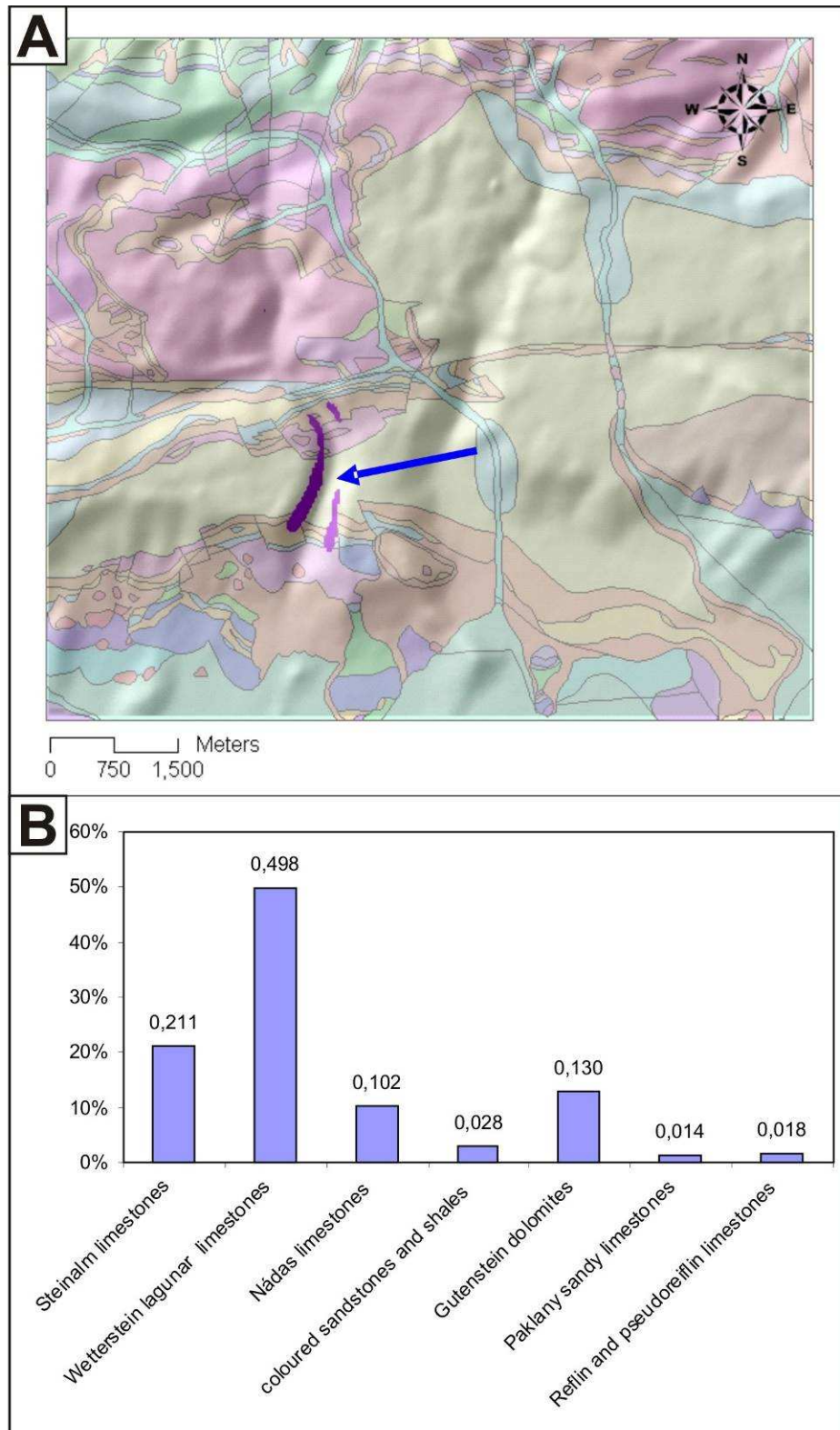


Fig.6A Geological map of the selected area. The rocks are of Triassic age. Limestones, dolomites, sandstones and shales are the most frequently occurring rock types (SGU 2000). The percentage of occurrence of the various rock types are given in Fig.6.b. The violet areas in the gorge (see the arrow) show those parts where the slope is greater than 45° . The degree of weathering had to be determined in situ, as no suitable multispectral satellite data were available for our work; **B** Frequency of occurrence of the rock types present in the selected area. The frequency values are given in the $\langle 0;1 \rangle$ interval. The percent values are obtained by multiplying the shown values by 100.

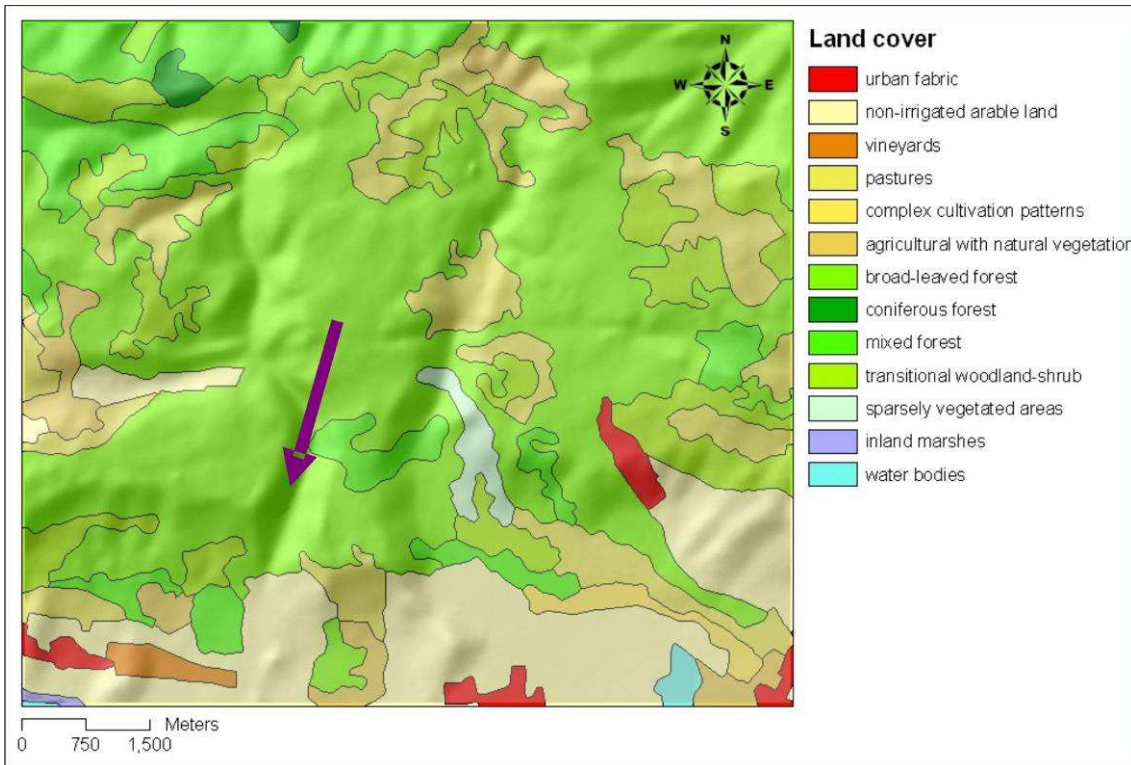


Fig. 7 Land cover map of the selected area. The 1:50 000 map fails to separate the smaller areas covered by vegetation and rock faces not covered by vegetation, as the units to be discriminated are usually smaller than 30x30m (see Fig. 9). The arrow shows the selected gorge.

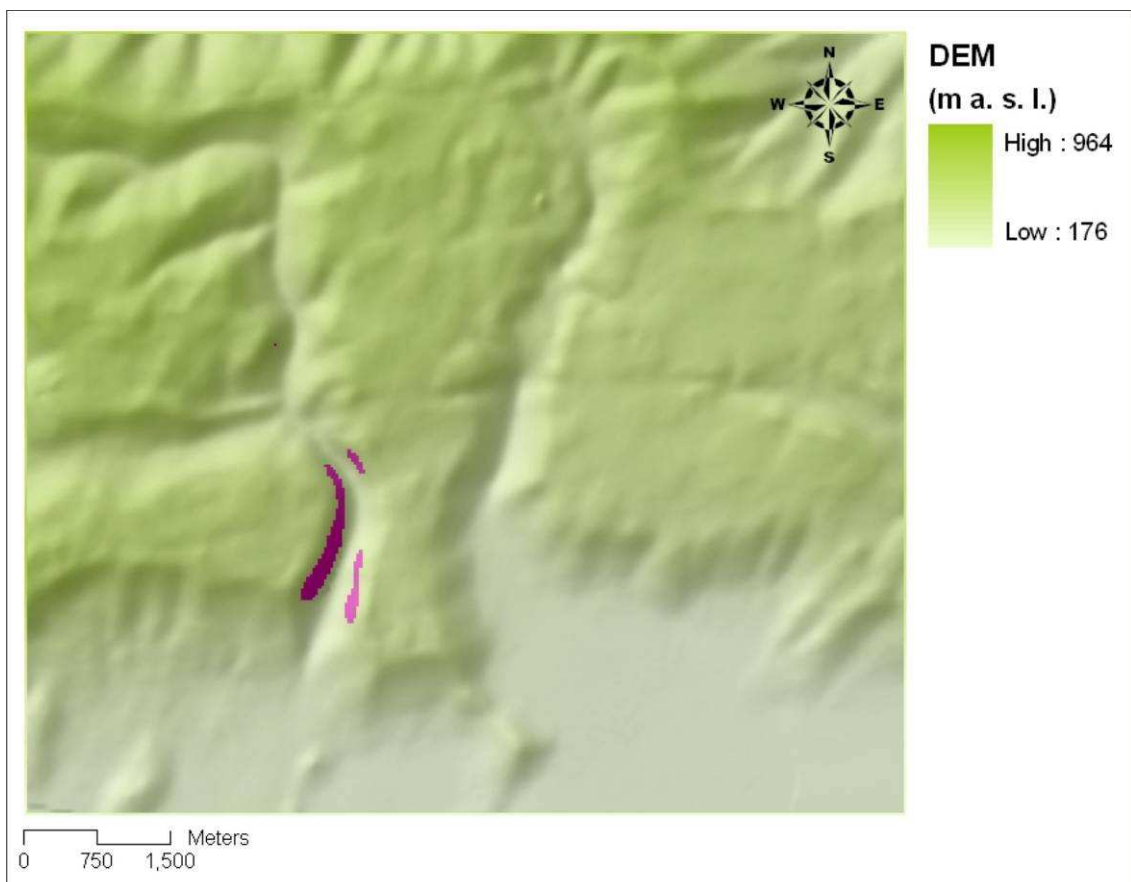


Fig. 8 Digital elevation model of the selected area. Areas of the gorge exhibiting inclination greater than 45° are shown in violet (m a. s. l. – metres above sea level).

SAFETY

The climber should be trained in mountaineering. This is usually done at a school of climbing. His outfit should satisfy the established safety criteria. He should choose only paths that do not endanger other people, animals or vegetation. He should not venture into terrain that he doubts to be able to manage safely. If the terrain proves to be too demanding, and if change of route is not possible, he should descend or rappel and should not try to overcome the difficult passages by using climbing gears.

In areas, where the rocks are fragmented or where the rocks are brittle (this holds true specially in case of limestone,

dolomites, some metamorphosed rocks as well as in case of some recent volcanic rocks), the climber should climb exerting great care, and should prevent disturbance of disintegrated rock layers, as it causes rock falls (cf. Fig. 9). In some cases, disturbing rock assemblages may be lethal. Exerting undue pressure on fragmented rocks held together only by their geometry and gravity can cause accidents and it leaves undesirable ecological footprint. Thus great care has to be taken when loading a rock as it may be loose or may trigger the collapse of a great volume of rock fragments. Therefore a 3 point support of the body is advisable. When the weather is damp or it rains, climbing is more risky also due to decreased friction.



Fig. 9 The organic climbing experience, **Photo by:** Jablonská

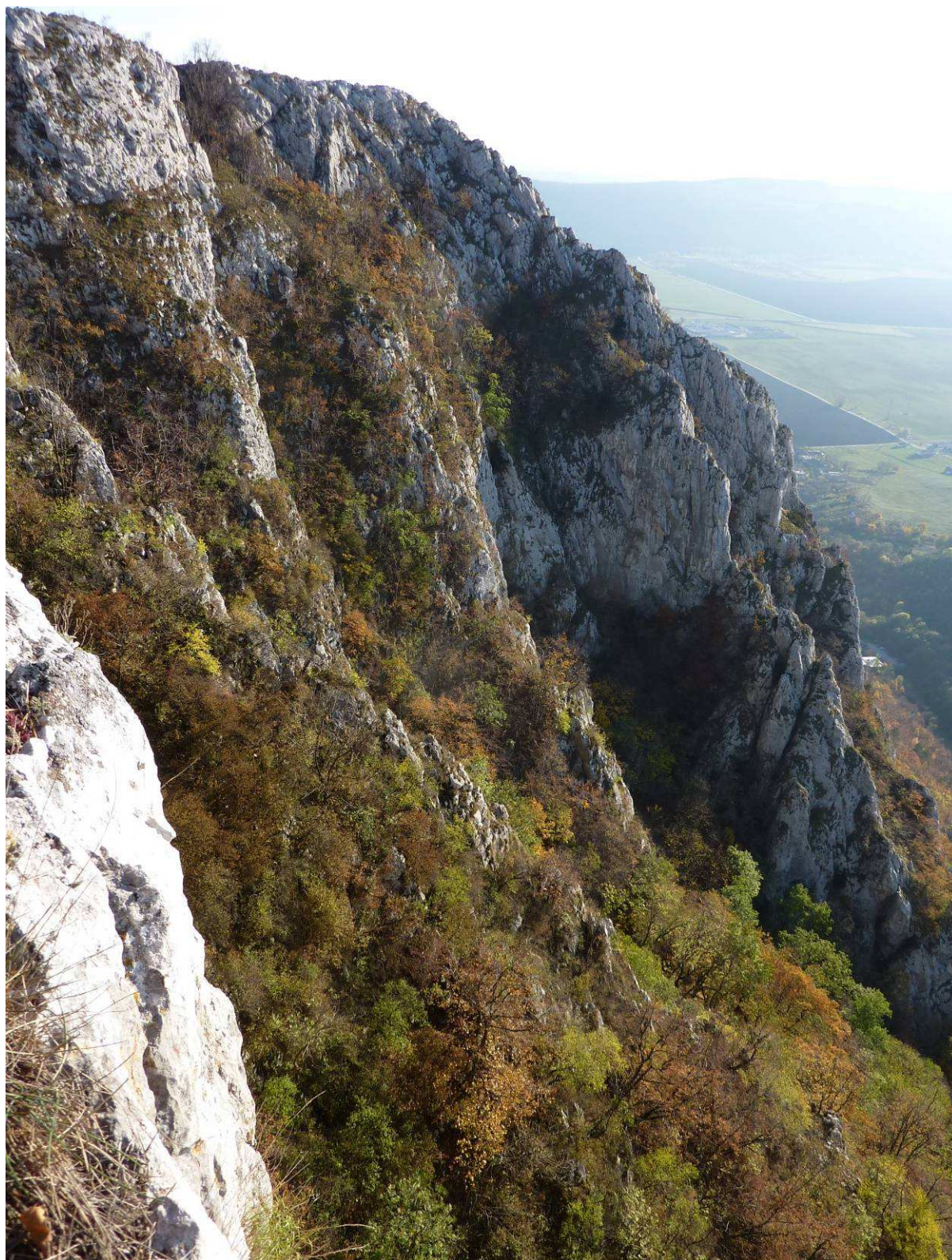


Fig. 10 Ground level picture of a well articulated terrain suitable for organic climbing (cf Fig. 4). The climbing path can be adjusted according to the abilities of the climber. The terrain is taken purely as an example. As it is situated in a National Park, climbing is permitted to registered climbers only in certain areas and at certain times of the year.

ORGANIC CLIMBING AND ANIMALS

In some areas, organic climbing facilitates unexpected meetings with animals like deer, fallow deer, chamois, foxes, hogs, groundhogs or snakes. Some animals may pose a danger – like bears or snakes. Animals are great explorers and in the mountainous areas, animal trails usually signify that there is a passage that could be taken when we need e.g. a descent route. One may be surprised to realize, that animals enjoy nice views, too. This may lead to some problems if one relies on e.g. the direction of a deer trail in a rocky area and assumes it gives an easy down route. The pathway may end at an exposed point, below which there is a demanding rock climbing terrain. There is also a different set of creatures that we can meet in terrain that is covered by vegetation, and they usually cause problems. Depending on climatic region, it can be invasive larvae, ticks, ants, scorpions or other bugs (e.g. the larvae of *Neotrombicula autumnalis*. It is 0.1mm long, climbs very quickly and leaves sore, irritating patches along its routes. The itchiness lasts for about 3 weeks. This acaroids living in soil infests tourists also in spring and summer, when sitting on soil or low vegetation. Its attack can be prevented by suitable repellents.) or microorganisms. It is necessary to learn how to prevent their coming into contact with us. An easy help package was defined by Strajnak (2010).

SERVICES NEEDED BY ORGANIC CLIMBING

Organic climbers are not expected to make out the majority of climbers. Mostly it is because they are not competitive and not expressly goal oriented. They would not expect to need expensive services, though at present, a segment of tourists has heterogeneous service requirements. At one time they prefer excellent hotels and

subsequently they spend a length of time bivouacking under harsh conditions. Organic climbers usually need a good travel infrastructure to and from the climbing area, lodging, food supply and restaurants, and after the tour some wellness services. Therefore in all climbing areas that cover extensive areas, emergency shelters and medical aid should be accessible. This type of tourism would provide earnings for small business and job opportunities for the local communities.

CONCLUSIONS

Organic climbing (OC) is a branch of mountaineering that is process oriented – it enjoys the nature along with the climbing tasks. Organic climbers should not use any technical gears apart from rope, karabiners, belay and personal safety outfit. The climber should leave a zero ecological footprint. The aesthetical value of the view and the enjoyment of nature is a therapeutic property of OC.

Surveying and defining potential OC terrains can be done by terrain work, or for more distant localities it can be done using complex procedures, involving satellite imagery (RS), digital maps, GIS and in some cases geostatistics. The OC paths are technically not too difficult, but may be challenging if the rocks are weathered or fragile and the vegetation thin.

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