

ACTA CARSOLOGICA	33/1	7	101-115	LJUBLJANA 2004
------------------	------	---	---------	----------------

COBISS: 1.01

**STRUCTURAL VOCABULARY OF CULTURAL  
LANDSCAPE ON THE ISLAND OF KRK (CROATIA)**

STRUKTURNI SLOVAR KULTURNE KRAJINE  
NA OTOKU KRKU (HRVAŠKA)

BRANKA ANIČIĆ<sup>1</sup> & IVA RECHNER<sup>1</sup> & DRAŽEN PERICA<sup>2</sup>

<sup>1</sup> Department of Landscape Architecture, Zavod za krajobraznu arhitekturu, Agronomski fakultet Sveučilišta u Zagrebu, Svetošimunska 25, ZAGREB, Hrvatska

<sup>2</sup> Department of Soil Science, University of Zagreb, Faculty of Agriculture, Croatia

Abstract

UDC: 911.53:551.44 (497.5 Krk)

**Branka Aničić & Iva Rechner & Dražen Perica: Structural vocabulary of cultural landscape on the island of Krk**

Within the large-scale research project in Croatian cultural landscapes, a special place is occupied by the Mediterranean area, with its highly valuable cultural landscape structures. This area is characterised by authentic structures, which represent a valuable cultural heritage and an important element of the national identity. The island of Krk is particularly inspiring in this respect, due to an intricate cultural landscape typology that has developed there under the influence of natural features on the one hand, and the centuries-long agricultural activity on the other. This paper is the result of research in its structural vocabulary in order better to understand and value these unique landscapes. The complex typological articulation was generated mainly by natural karst phenomena (karst valleys and fields, small dolinas, dry valleys), as well as various stone walls, terraces, and similar features, formed through the process of land cultivation. A considerable diversity of landscape units and patterns has been identified through particular structures which often turned out to be assets themselves, and which at the same time help to understand and interpret the outstanding value of the island's landscape.

**Keywords:** landscape typology, vocabulary, structural features, cultural landscape, rural landscape, island Krk.

Izvleček

UDK: 911.53:551.44 (497.5 Krk)

**Branka Aničić & Iva Rechner & Dražen Perica: Strukturni slovar kulturne krajine na otoku Krku**

V okviru raziskovanja kulturne krajine v Republiki Hrvaški gre posebno mesto območju Mediterana, na katerem je še najti, zvečine ogrožene, ostanke vredne kulturne krajine, ki se je izoblikovala pod vplivom podnebnih in talnih razmer na eni kot dolgotrajne svojevrstne kmetijske dejavnosti na drugi strani. Označujejo jo posebne strukture, zavoljo katerih ta kulturna krajina pomeni vredno kulturno dediščino in je hkrati tudi prvina nacionalne prepoznavnosti. Otok Krk v tem pogledu zbuja posebno pozornost, saj se je tu razvila raznovrstna tipologija vredne kulturne krajine. Ta prispevek je rezultat raziskav njenega strukturnega slovarja z namenom priti do boljšega umevanja in vrednotenja te krajine.

Glede na kraški značaj območja so na njegovo veliko tipološko razčlenjenost najizraziteje vplivali naravni kraški pojavi (vrtače, uvale, kraška polja in suhe doline). Kot posledek obdelovanja tal pa so nastale raznovrstne tvorbe kamnitih suhozidov, teras in drugih prvin. Ugotovljena je bila znatna pestrost krajinskih enot in vzorcev, in sicer s pomočjo struktur, ki tudi same pomenijo določeno vrednost in prispevajo k razumevanju in odčitavanju izjemne vrednosti teh krajin.

**Ključne besede:** krajinska tipologija, slovar, strukturne značilnosti, kulturna krajina, podeželska krajina, otok Krk.

## INTRODUCTION

Under the influence of climate, natural features and long-lasting economic development, as well as numerous social changes, characteristic agricultural methods have developed in the Mediterranean (multi-use tree planting, fruit growing, sheep-farming, grape-growing, olive growing) based on the balanced use of space. Sense of landscape value, especially of the importance of cultural landscapes, has mainly developed in Europe only after most of its exceptional cultural landscapes have been lost. This depreciation process and disappearance of the most valuable landscapes has been the most pronounced in the Mediterranean. The appeal for their recognition and protection was initiated with the Lake District Declaration of the 1987 International Symposium on Protected Landscapes (Naveh, 1993). In their book 'Landscape ecology', Naveh and Lieberman suggest to produce Red Books for Threatened Landscapes, in order to identify areas of extraordinary cultural and ecological values facing very high risk of inevitable loss (Naveh & Lieberman, 1984). Complying with the criteria for the inclusion of landscapes in the 'Red List', Rossi and Vos have used the example of a Tuscany landscape to demonstrate the main three types of Mediterranean landscape that would qualify for the Red List: 'relict', 'vanishing' and 'strained' landscapes (Rossi and Vos, 1993, Phillips, 1998). Systematic protection of outstanding landscapes has been considered by UNESCO and the European Council in the European Landscape Convention (Droste, 1995, Council of Europe, 1996). Slovenia also elaborated the regional typological landscape classification and the list of outstanding landscapes within its Landscape Protection Strategy (Marušič 1998, Ogrin 1993).

In the Adriatic, especially on the islands, there is a multitude of typologically colourful original landscapes. Their peculiarity is based on special structural features, which make up the formal point of departure for our identification of original structure of these landscapes.

Our research of Adriatic landscapes, with the aim of formulating proposals for their adequate protection, has led us to the conclusion that the key should be learning of the structural vocabulary of cultural landscapes. This would make it possible to identify valuable landscape heritage, typologically classify it, and establish evaluation and preservation instruments (Aničić, 2003).

On the island of Krk, which is one of the major Adriatic islands, one can notice distinctive changes in the landscape structure and heritage, resulting from frequent socio-economic changes, tourist development, and abandonment of agricultural areas. The latter process has led to a progressive loss of traditional landscape patterns (dilapidation or deliberate demolition of existing dry stone walls, their spontaneous overgrowth). Disappearance of these patterns will result in the transformation of highly valuable areas into simplified and less interesting landscapes. Consequently, they would lose their unique value due to the disappearance of cultural and visual qualities.

## VOCABULARY OF CULTURAL LANDSCAPE

Practically every complex artefact in any area of creativity is made up of certain basic, frequently appearing units. This makes it possible to apply syntactic terminology of verbal or written communication to the structural analysis of landscapes. Therefore structural elements can be determined for the vocabulary of cultural landscapes as well, which is the primary goal of this paper.

Analogously to words and phrases of a language, landscape vocabulary is made up of clearly formulated, sometimes even natural structural units, and basic elements and materials forming its structural patterns. These can be new relief formations, plant covers, economic conditions – especially

the field patterns – built-up elements, and combinations of built-up and natural structures which characterise a concrete landscape, pointing to natural, economic and social processes that generated them. In this context, Anne W. Spirn (1998) in her book 'The Language of Landscape' states that each landscape can be spoken, written, read and imagined.

## **STRUCTURAL VOCABULARY OF THE CULTURAL LANDSCAPE ON THE ISLAND OF KRK**

The basic landscape elements that form vocabulary units on the island of Krk are mainly cultivated small dolines (tors, drmons, mrgars), regular, irregular and oval stone walled terraces and other types of agricultural cultivation. All these elements predominantly depend on topographic features and forms, and for most of them these are the basics for the development of their structural peculiarity.

Considering the basic relief features, Krk can be divided into three principal, significantly differing areas: northern, central and southern. The varying natural features and land-use methods have contributed towards development of their specific typological identities.

The northern part of the island is a lowland area, very favourable for siting industrial facilities.

The central part is elevated, with slightly rolling relief forms. Besides relief features, the soil also favoured the intensive development of agriculture. Coastal production was located on the hillsides, whilst agricultural activities in the hinterland were organised in different dolines. No other areas were cultivated, therefore becoming overgrown with forest or remaining barren land.

The southern part of the island is pronouncedly different from the rest. Dominant here is the Baško polje, deeply cut into the mainland, which almost symmetrically divides the area in two parts. The polje is used for agriculture. On both sides of the polje at the altitude of 300-400 m there are karst plateaus. Due to climate and soil conditions there is no high vegetation, but rather dominant rocky pastures.

Lithological characteristics of the island have conditioned the dominant relief forms, created by corrosion processes. Characteristic is the occurrence of exogenous (dolines, karst poljes and dry valleys) and different type of denuded karst, dolines, as well as semi-covered and covered karst (with dominant forest vegetation) are found in the area as well.

Karst poljes are a form of exogenous relief. These are deep, semi-enclosed or enclosed niches in carbonic rocks, mostly limestone. Their bottom is flat, and their sides steep, ranging in length from several hundred to 3.000 meters, with widths reaching up to 1.000 m. It is thought that they have formed only in areas with extremely thick limestone layers, and they are mostly filled with residual debris. There are several such fields in the island: Vrbničko polje, Mali and Veliki Lug, Ponikve and Omišaljsko polje. Karst poljes are very valuable arable lands.

Dolines (adapted for agrarian long use) are an exogenous karst form, appearing in different dimensions, from several meters to even a hundred meters wide, and around ten meters deep. Dolomites favour the creation of shallow dolines with milder forms (dolomites are more prone to mechanical, less to chemical wear-out). Dolines in limestone are deeper (more pronounced vertical corrosion), and regularly conical or funnel-shaped. The bottom is usually residual debris and sloping material, which has long been used in agriculture.

Water and its periodical occurrence have primarily influenced the formation of pastureland landscapes, and less contributed to the distribution of agricultural fields. Characteristic are the water wells traditionally called 'krušije' or 'vručice', out of which eighty has been recorded. In the past these wells were of great practical use – water for laundering, watering cattle and cooking was collected in small, rectangular or circular retaining walls.

Another frequently found water phenomenon is the karst fen or water tanks, natural water collection facilities. Water retention in some dolines is conditioned by clay bottom (Novosel, 1987).

Favourable terrain, without major negative influences of the northeastern wind (bura), was the most probable reason that almost 80% of all settlements on the island are located in its central part. Distribution of settlements in this area was most likely influenced by the quality of arable land as well. Viewed historically, the settlements have developed in full harmony with natural features, on strategically important locations of minor elevations, both inland and along the coast.

Generally, on the whole eleven types of cultural landscape can be identified according to their structural features these may be classified into four basic categories: landscapes of rocky terrain, stone walled terraces, pastureland and tilled fields. Their structural features depend on the respective basic formation unit, which in this case are predominantly arable plots. In order for a structure to become a basic unit relevant for the formation of landscape, it should show a more frequent appearance.

Primarily the cultural landscapes that have been articulated by dry stone walls have been analysed (eight of them), because they possess a heritage value. According to their origin, they can be divided in two groups: those derived from natural karst phenomena, and those originated as products of land cultivation.

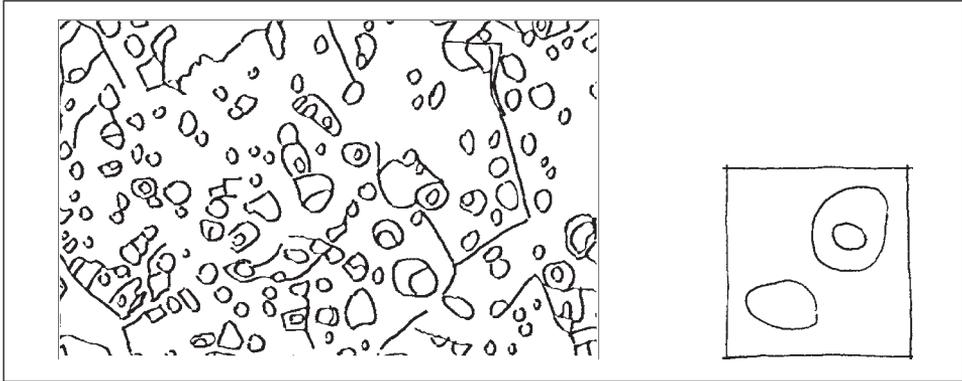
The first category includes structures developed on the basis of small dolines and karst poljes. These are by nature circular, rounded, funnel-shaped or wide elongated cavities varying in width, depth and length. Their main common feature is a more or less symmetrical oval shape following the topographic forms, and defined by single dry stone walls. This category of bowl-shaped dolines in covered karst includes the following morphological units:

1. cultivated dolines
2. dolines (local term tors)
3. dolines (local term drmuns)
4. dolines (local term mrgars)

Cultivated dolines (Photo 1) have developed in karst dolines with a thick layer of fertile soil and therefore used for farmland or other production as agricultural land. The basic unit has a circular or moderately elongated form. As complex structures, they have formed a peculiar landscape pattern (interchanging small, big, full, empty, light, dark dolines) (Figure 1).

Small dolines caused depressions - tors and drmuns (Photo 2) are found on pastureland, in parts with skeleton soil and high impact of wind. Stones extracted from shallow dolines were used to build dry stone walls (border walls) for the protection of cattle against strong winds. Due to the remoteness from the settlements, but also due to the specific climate, they were not convenient for a more intensive use; therefore tors were used for grazing. Drmuns (Photo 2.2) are private forest plots that were used not only for firewood, but also for sheltering sheep against the strong sun and storms. Basic units are round or moderately elongated in shape, occurring in various dimensions. Their integration has resulted in complex structures with recognisable patterns, and various combinations of defined plots, either as bright open structures (Figure 2), or as forests.

A structure different from those above, limited by dry stone walls, is mrgar – the facility for driving herds after the summer grazing periods. Mrgars come in various shapes, and the most distinctive one in the island, and beyond, is Veli mrgar (Photo 3). Fučić calls it ‘the most monumental work of sheepherding architecture’ (1998:181), its form resembling a stone flower. The basic unit is the circle – a hall (sala) central to the fan-shaped smaller tors (mrgarići) around it, each having a separate entry and exit openings (Figure 3). The eastern entrance is in the shape of a funnel (Vinščak, 1999).

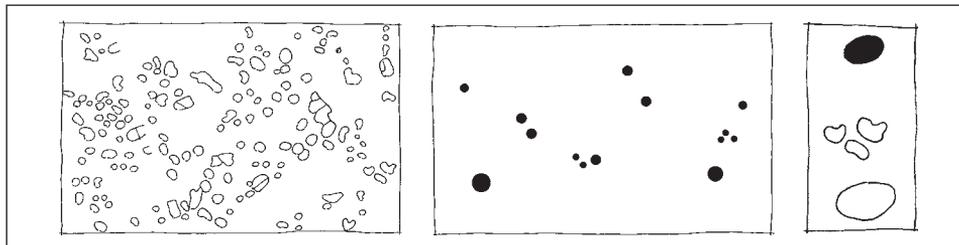


*Figure 1: Doline pattern;*

*Basic units.*



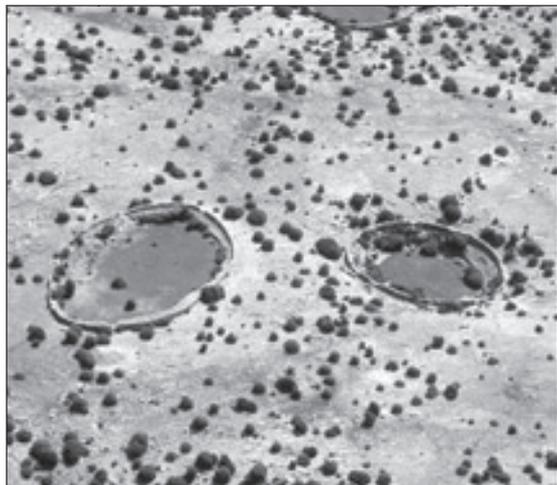
*Photo 1: Doline near Poljica.*



*Figure 2: Doline pattern;*

*Tree pattern;*

*Basic units.*



*Photo 2.1: Dolines – Tors (pasture plots).*



*Photo 2.2: Dolines – Drmuns (forest plots).*



*Photo 2: Small dolines caused depressions (local term Tors - right and Drmuns – left).*

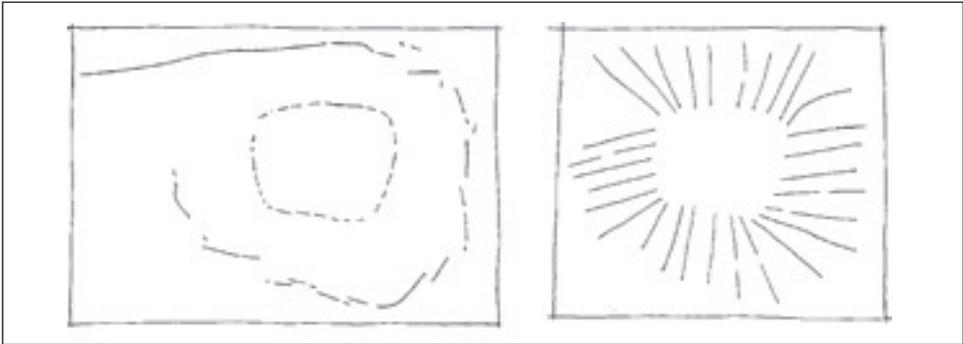
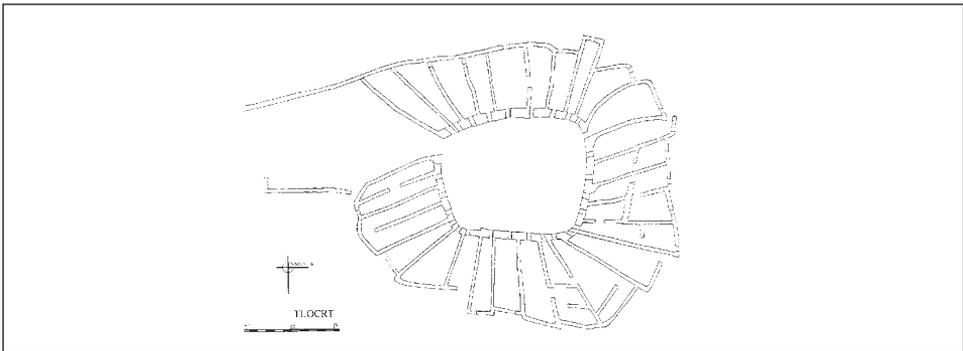


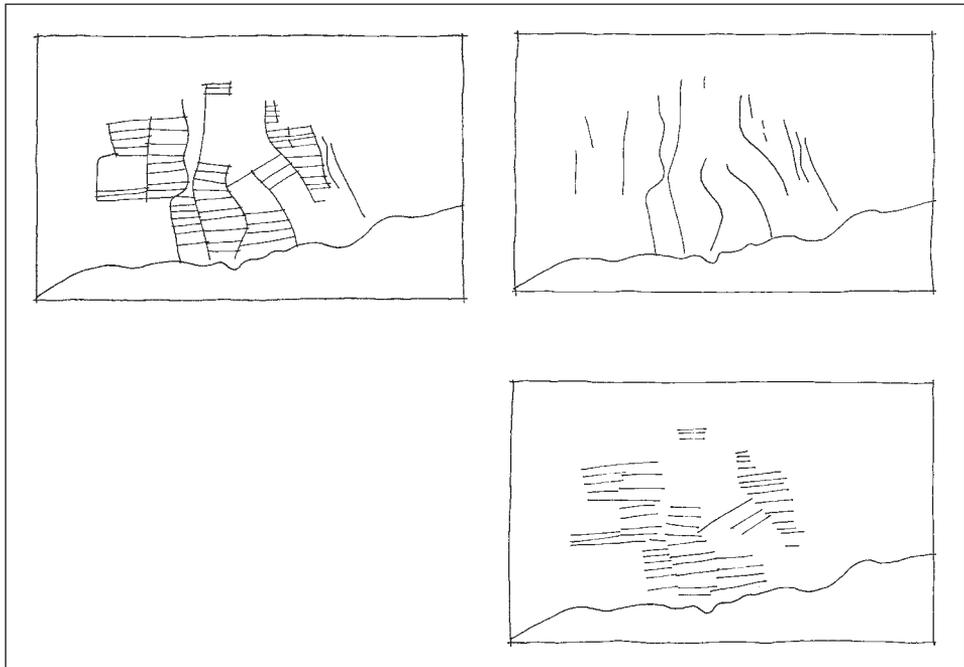
Figure 3: Basic units dry stone wall pattern A; B.



Drawing 1: Screening Big mrgar 1992.



Photo 3: Big mrgar NE from the town of Baška.



*Figure 4: Box-pattern; Vertical dry walls; and Horizontal dry walls (Punat).*



*Photo 4: Box-like landscape near the town of Punat.*

The following are the landscape types created as products of land cultivation:

5. rectangular stone walled terraces
6. irregular stone walled terraces
7. oval stone walled terraces,
8. regular fields

Rectangular stone walled terraces - box-like landscape (Photo 4) are symmetrical and pronouncedly elongated, in line with the slope inclination (5-12°). The stone walled terraces were formed on shallow, fertile arable soil (red soil). For better use of the soil, it was necessary to remove as many rubble as possible, which were subsequently arranged into scarps, resulting in the shaping of terraces. The basic structural units are dry walls arranged in two interchanging directions – horizontally and parallel with the slopes (scarps), and at right angles to the slant (single row-walls and varvakan with single row-walls). Together they make a reticular cultural terrace pattern (Figure 4). Gams (1991,96.) refers to this landscape type as box-like landscape.

An irregular forming stone walled terrace (Photo 5 and 5.1) occurs on mild slopes (0-2°) and favours cultivation of woody plants (olives). The basic units are small and large irregular plots limited by dry stone walls, local term for all types dry walls on the island Krk are *gromače* (Figure 5). Dry wall dominates the various shapes resulting from different techniques of arranging stone (single or double row walls), width (narrow, wide), volume (transparent, filled out, thick), and texture (smooth, rough, dark, light etc.) as Gams has indicated (1991). Integration of such irregular units results in an impressive reticular pattern. Intertwined in it is the line structure of paths, stressing the radial pattern with irregular lines. A high degree of interfusion of the structure of the town of Krk itself is present here, and it is likely that the very expansion of the town has caused the development of such a landscape pattern. The process of joint growth lasted for centuries, resulting in the creation of a spatial entity of exceptional structural value and visual qualities.

Oval field terraces (Photo 6) have been formed within dry *poljes* of irregular relief and uneven distribution of fertile land. This landscape type is defined by border walls and scarps forming irregular, oval units, sequenced into elongated, irregular forms (Figure 6). The shape and plots layout are conditioned by micro relief forms generated by torrents. Erosion, caused by sporadic watercourses (at times of precipitation maximum), has brought in the soil from the surrounding area into the bottom of the torrent bed. Scarps and border walls enables retention of the soil and water, which adds to the maximum exploitability of the area that is usually rather forbidding. Preciousness of water and soil is the most pronounced exactly in this type of landscape. Despite poorly accessible and hardly arable land, the torrent area has still been used for agriculture.

The last structural type is regular *poljes* (Figure 7), limited by straight, and single-row dry walls. It has developed on the karst plateau at the southern edge of elevation adjacent to the Baška Valley. The basic units are again single row dry walls, stretching once horizontally and parallel to the contour lines, and then vertically to them (Sketch 7), together forming a regular, loose reticular pattern. Formation of these arable plots was contributed by the deposition of soil particles (red and brown soils) washed in from the adjacent area.

This overview of structural features of a cultural landscape shows that a huge diversity of landscape units, patterns and types has developed in the area. These valuable structures help us in determining, reading and understanding our exceptional heritage values of cultural landscapes on the island of Krk.



*Figure 5: Reticular dry wall pattern;*

*Road pattern;*

*Basic units (Krk).*



*Photo 5: Dry stone wall pattern around the town of Krk.*



*Photo 5.1: Irregular stone walled terraces – detail (olive tree plantation).*

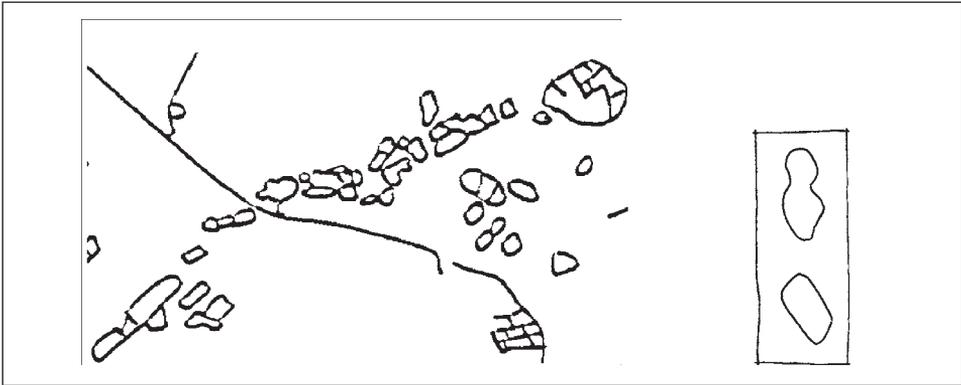
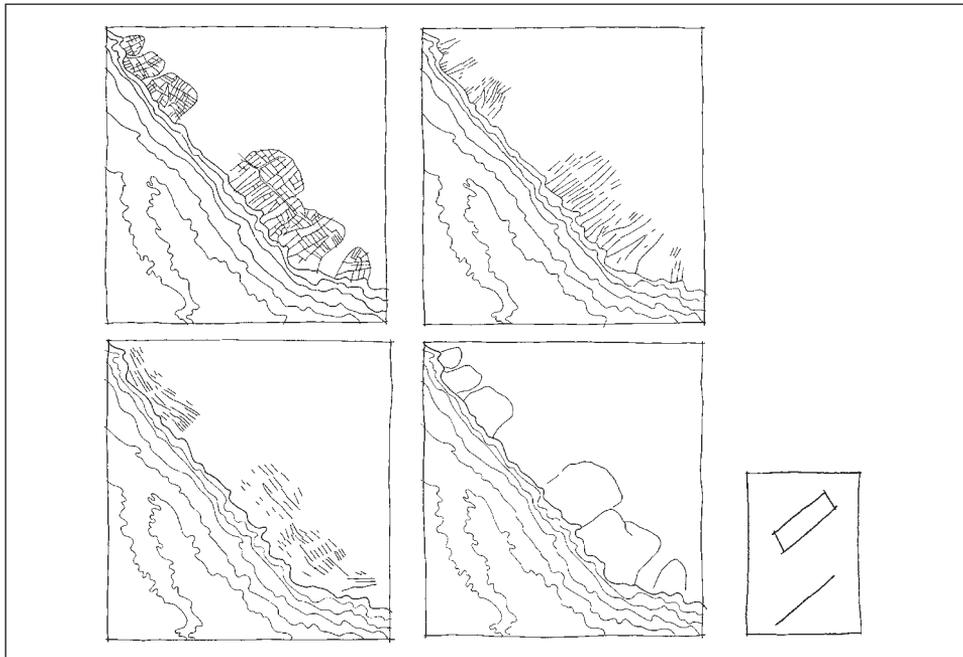


Figure 6: Oval field terraces pattern;

Basic units.



Photo 6: Oval field terraces on a slope near Stupno čelo.



*Figure 7: Dry stone wall pattern;*

*Basic units (Bašćanska udolina).*



*Photo 7: Landscape of regular dry stone walls at the karst plateau on the southern elevation above the Baška Valley.*

## CONCLUSION

Analysis of structural features on Krk shows a highly valuable typological diversity of cultural landscapes that still exists on this island. In analogy with language structure, words and phrases, eleven basic landscape units were identified. These, in certain combinations produce eight landscape patterns, mostly of outstanding value. Along with natural karst phenomena, man-made stone walls are the main construction types articulating the landscape vocabulary through different categories (single or double rows, escarpments, gromače). They appear as oval, irregular, curved, radial, or rod-shaped lines.

According to their origin, they are divided in two groups. One includes stone walls constructed where the basic unit is composed of arable, natural karst phenomena (valleys and small dolinas), featuring a more or less regular oval shape that follows the topographic forms. This category includes four morphologically different units, appearing in the same or similar shapes.

The other category includes stone walls created by land conversion into arable soil. In such cases, the basic structural unit is a terrace articulated by various types of supporting walls. The stone walled terraces come in smaller or larger patterns, depending on the topography and the purpose. Their fusion results in the easily recognisable terraced formations, such as regular box-like landscapes or irregular grid patterns, as well as smaller or larger terrace fields.

## REFERENCES

- Aničić, B. & Perica, D., 2003: Structural features of cultural landscape in the karst area (Landscape in transition), *Acta carsologica*, 32/1, 173-188.
- Council of Europe 2000: European Landscape Convention  
<http://www.coe.int/T/e/Cultural%5FCo%2Doperation/Environment/>
- Crowe, S. & Mitchell, M., 1988: *The Pattern of Landscape*, Chichester
- Droste, V. Von, 1995: *Cultural Landscapes of Universal Value*, UNESCO
- Fučić, B., 1998: *Terra incognita. Kršćanska sadašnjost*, 2nd edition, Zagreb
- Gams, I., 1991: Systems of Adapting the Littoral Dinaric Karst to Agrarian Land Use. *Acta Geographica*, Ljubljana, 106.
- Gams, I., 1993: Human Impact on the Dinaric Karst; U: Gams, I. et al., *Environmental Change and Human Impacts on the Mediterranean Karst of France, Italy and the Dinaric Region*, Karst Terrains Environmental Changes and Human Impact, Catena Supplement 25, Cremlingen-Destedt, Germany, p. 83-93.
- Gams, I., 1973: *Slovene Karst Terminology*, Ljubljana, 76.
- Marušić J. et. al., (1998): *Regionalna razdelitev krajinskih tipov v Sloveniji*, Ministarstvo za okolje in prostor, Urad R. Slovenije za prostorsko planiranje, Ljubljana
- Naveh, Z. & Lieberman, A.S., 1984: *Landscape ecology: Theory and Application*. Springer, New York.
- Naveh, Z., 1993: Red Books for threatened Mediterranean landscapes as an innovative tool for holistic landscape conservation. Introduction to the western Crete Red Book case study, *Landscape and Urban planning*, 24, 241-247.
- Novosel-Žic, P., 1987: *Otok Krk*, Zagreb

- Ogrin, D., 1993: Landscape Classification in Slovenia –Dilemmas – Problems – Approaches. Typological Landscape Classification, Office of the Republic of Slovenia for Physical Planning, 199-126.
- Phillips, C.P., 1998: The Crete Scensi, Tuscany A vanishing landscape? Landscape and Urban planning, 41, 19-26.
- Rechner, I., 2002: Prilog poznavanju i zaštiti krajobraza na otoku Krku, diplomski rad
- Roglić J., 1974: Prilog hrvatskoj krškoj terminologiji, Krš Jugoslavije, 9/1, 1-72.
- Rossi, R., Vos, W., 1993: Criteria for the identification of a red list of Mediterranean landscapes: three examples in Tuscany. Landscape and Urban planning, 24, 233-239.
- Spirn W. A., 1998: The Language of Landscape, Yale University Press, 326.
- Vinšćak, T., 1999: Veli mrgar or Flower in the stone, Studia Ethnologica Croatica, 10/11, 89-93.
- Vos & Meekes, 1999: Trends in European cultural landscape development: perspectives for a sustainable future, Landscape and Urban planning, 46, 3-14.
- Glossary and multilingual equivalents of karst terms, UNESCO, FAO, 72, 1972.
- Authors of photographs: Branka Aničić (2;4;6;7); B. Fučić (3), Zofija Mavar (1); Iva Rechner (5; 5.1).

