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ARHEOBOTANIČNE RAZISKAVE NA IZBRANIH NAJDIŠČIH POSOŠKE ŽELEZNODOBNE SKUPNOSTI

ARCHAEOBOTANICAL EVIDENCE FROM SELECT SITES OF THE POSOČJE IRON AGE COMMUNITY

Metka CULIBERG

Železnodobna nekropola Most na Soči sodi z več kot 6000 izkopanimi grobovi med največje doslej raziskane v evropskem prostoru (Dular, Tecco Hvala 2018, 9). Na ostanke iz tistega časa še vedno naletijo naključno ob gradbenih posegih na območju današnjega naselja. Med letoma 2000 in 2002 je bilo z zaščitnimi arheološkimi izkopavanji Tolminskega muzeja odkritih na Pucarjevem robu novih 36 železnodobnih grobov, na ledini Repelc pa 54 iz železne in rimske dobe. Na severnem robu Repelca je bila odkrita tudi žganinska plast, ki po obsegu in količini oglja kaže na to, da je bilo na tem mestu skozi daljše obdobje sežigališče umrlih, morda pa tudi prostor za kultne obrede.

Poleg bogatih arheoloških najdb so bili iz teh grobov zbrani in analizirani tudi arheobotanični ostanki: oglje drevesne in grmovne vegetacije, medtem ko semen ali plodov, z izjemo nekaj zrn prosa, ni bilo. V razpravo so vključene še arheobotanične raziskave nekaterih drugih grobišč posoške železnodobne skupnosti z namenom, da bi ugotovili, v kolikšni meri je poselitev v posameznih obdobjih vplivala na okolje.

ANTRAKOLOŠKA ANALIZA

Vsak primerek oglja je bil pregledan pod svetlobnim mikroskopom Ortholux pod vpadno svetlobo Ultropak, v večini primerov v vseh treh presečnih ravninah: prečni, radialni in tangencialni. Za prepoznavo lesnih vrst so bili uporabljeni določevalni ključi po Gregussu (1954) in Schweingruberju (1978; 1990), kot najbolj uporabna pa se je izkazala lastna primerjalna zbirka oglja recentnih lesnih vrst (Culiberg). V številnih primerih določitev vrste oglja ni bila mogoča, ker so bili primerki prepereli ali so imeli lesna vlakna zapolnjena s sedimentom. Rezultati antrakološke analize so prikazani v tabelah ali na grafih po posameznih izkopavalnih enotah. Oglje je večinoma določeno le do rodovne taksonomske kategorije. Prevladovali so primerki velikosti 0,5–1 cm, zato določanje do kategorije vrste ni bilo zanesljivo, kajti vrste istega rodu se med seboj po anatomski zgradbi lesa večinoma zelo malo razlikujejo. Le pri taksonih, kjer rod zastopa ena sama vrsta (npr. *Fagus sylvatica* – bukev, *Abies alba* – bela jelka), je navedeno tudi vrstno ime, enako pri vrstah, kjer je določitev mogoča in potrebna (npr. pri rodu *Prunus*: *Prunus spinosa* – črni trn, *Prunus avium* – divja češnja).

MOST NA SOČI – PUCARJEV ROB

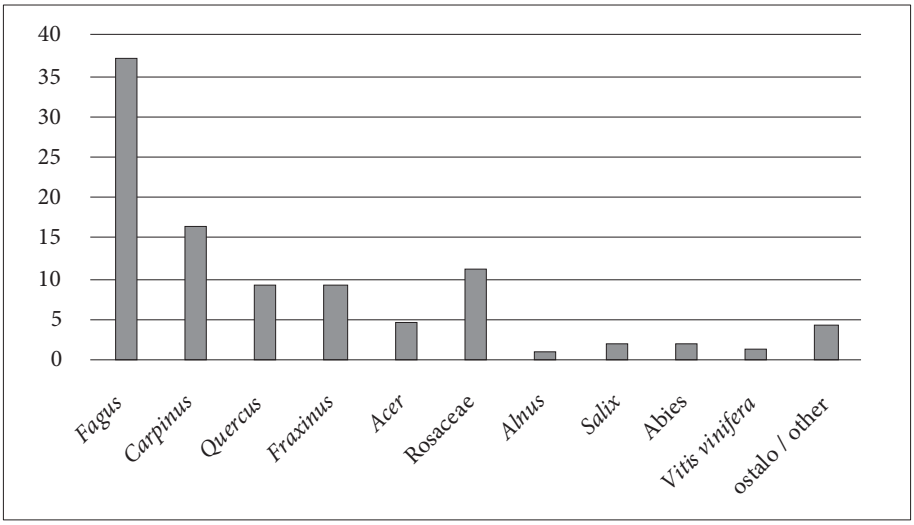
Na območju Pucarjevega roba je bilo za antrakološko analizo s flotacijo zbrano oglje iz 27 železnodobnih grobov: PR 1, 2, 3, 4, 5A, 6, 7, 8, 10, 11, 12, 14, 16, 17, 18, 20, 21, 22, 23, 25, 28, 29, 31, 32, 33, 34 in 35. Skupno je bilo analiziranih 254 primerkov. Rezultati so prikazani v *tabeli 1* in na *grafu 1*. Oglje iz dveh grobov (PR 4 in 7) je bilo popolnoma preperelo in zato nedoločljivo, v nekaterih drugih grobovih so bili za analizo ustrezni le posamični primerki, kajti ostalo so bile le grude peščenega sedimenta s primešanimi drobci oglja (glej tu Mlinar, str. 15, sl. 4).

Ugotovljenih je bilo 18 taksonov. Z največjim odstotnim deležem je zastopana bukev (37,4 %), precej manjše so odstotne vrednosti drugih listavcev: gabra (16,5 %), hrasta (9,4 %), jesena (9,4 %), javorja (4,7 %), vrbe (2,0 %) in jelše (1,2 %). Iz družine rožnic (Rosaceae 11,0 %), ki je sistematsko razdeljena v več poddružin

Tab. 1: Most na Soči – Pucarjev rob. Rezultati analize oglja iz železnodobnih grobov.
Tab. 1: Most na Soči – Pucarjev rob. Analysis results for the charcoal taken from Iron Age graves.

	Grobovi / Graves																										
	1	**2**	**3**	**5A**	**6**	**8**	**10**	**11**	**12**	**14**	**16**	**17**	**18**	**20**	**21**	**22**	**23**	**25**	**28**	**29**	**31**	**32**	**33**	**34**	**35**		
Taksoni / Taxa																										Σ	%
Abies alba (bela jelka / silver fir)																					1	4				5	2,0
Quercus sp. (hrast / oak)	1				14																3			6		24	9,4
Fagus sylvatica (bukev / common beech)			2	3	1	1				3	11				1		10		4	1	19	8	22	2	7	95	37,4
Carpinus sp. (gaber / hornbeam)	12	3	1	1	6	7			7				1							4						42	16,5
Ostrya carpinifolia (črni gaber / hop-hornbeam)												1								1						2	0,8
Fraxinus sp. (jesen / ash)	2			1	1								4			1	10				1	1	1	2		24	9,4
Ulmus sp. (brest / elm)																									1	1	0,4
Acer sp. (javor / maple)					1		1			4	4	1									1					12	4,7
Betula sp. (breza / birch)	1																									1	0,4
Corylus avellana (navadna leska / common hazel)													1									1				2	0,8
Alnus sp. (jelša / alder)	1									1														1		3	1,2
Salix sp. (vrba / willow)											4										1					5	2,0
Populus sp. (topol / poplar)											1													1		2	0,8
Prunus avium (divja češnja / wild cherry)																									1	1	0,4
Rosaceae (rožnice / rose family)	1	2			1			2			4		1	3		2	6	4						2		28	11,0
Berberis sp. (češmin / barberry)																								1		1	0,4
Evonymus sp. (trdoleska / spindle tree)														2												2	0,8
Vitis sylvestris (divja vinska trta / grape vine)																		4								4	1,6
Σ / %	18	5	3	5	24	8	1	2	7	8	24	2	7	5	1	3	26	8	4	6	26	14	23	15	9	254	100

Graf 1: Most na Soči – Pucarjev rob. Rezultati analize oglja iz 25 železnodobnih grobov (n = 254 primerkov).
Graph 1: Most na Soči – Pucarjev rob. Analysis results for the charcoal from 25 Iron Age graves (n = 254 specimens).



(Martinčič et al. 1999), sta zastopani dve: Maloidae in Prunoidae. Poddružina Maloidae vključuje rodove: jerebiko/mokovec (*Sorbus*), hruško/drobnico (*Pyrus*), lesniko/jablano (*Malus*), glog (*Crataegus*) in še nekaj drugih. Ker imajo ti rodovi zelo podobno anatomsko zgradbo lesa, njihovo določanje ni zanesljivo, vendar glede na sicer nekaj manj izrazitih prepoznavnih anatomskih znakov menim, da največji delež oglja vendarle pripada mokovcu (*Sorbus aria*), ki se kot pionirska vrsta pogosto uveljavi na zaraščajočih površinah. Poddružina Prunoidae vključuje le en rod, *Prunus*, pri katerem se anatomska zgradba lesa precej razlikuje od prej omenjenih rodov (po več celic širokih trakovih in po spiralnih odebelitvah na trahejah). En sam primerek oglja v grobu PR 35 pripada divji češnji, ki kot posamično drevo ali v manjših skupinah pogosto uspeva v nižinskih gradnovo-gabrovih ali sredogorskih bukovih gozdovih (Brus 2004, 198). V skupno vrednost 4,4 % so vključeni sporadično prisotni taksoni: črni gaber, brest, breza, leska, topol ter grmovni vrsti češmin in trdoleska. Posebno zanimiva pa je v grobu PR 25 prisotnost štirih koščkov oglja vinske trte, po vsej verjetnosti gre za divjo vinsko trto (*Vitis vinifera* ssp. *sylvestris*). Od iglavcev je skromno zastopana le jelka (2 %).

MOST NA SOČI – REPELC

Na ledini Repelc so bile odkrite najdbe iz več prazgodovinskih obdobij (bronaste ter starejše in mlajše železne dobe) in rimske dobe. Odkriti so bili sledovi naselbine, grobovi, jame in sežigališče (glej tu Mlinar, str. 91–96).

Bronastodobna naselbinska plast

V najgloblji kulturni plasti (SE 5) so bile evidentirane skromne bronastodobne ostaline. Ostanki hiše iz mlajše bronaste dobe so bili odkriti tudi na pomolu med sotočjem Idrijce in Soče (Dular 2018, 147), iz česar je mogoče sklepati, da sta bila v bronasti dobi verjetno poseljena tako desni kot levi breg reke Idrijce (glej tu Mlinar, str. 91). Iz te plasti na Repelcu izhaja le skromna količina oglja: bukev (*Fagus*) 19 primerkov, hrast (*Quercus*) 11, jelka (*Abies*) 4, ki morda nakazuje, da je tu še uspeval bukovo-jelov gozd (Abieti-Fagetum), verjetno že nekoliko iztrebljen, na njegova rastišča pa naj bi se že naseljeval hrast.

Železnodobni žgani grobovi

Iz 25 železnodobnih grobov (R 10, 12, 13, 14, 16, 18, 19, 20, 22, 23, 25, 25B, 26, 28, 33, 34, 35, 37, 38, 40, 41, 45, 48, 51 in 52) je bilo skupno analiziranih 482 primerkov oglja (*tab. 2*). Dobra polovica vsega oglja pripada bukvi (52,6 %), delež oglja gabra je 17,4 %, jesena 13,5 % in javorja 8,7 % (*graf 2*). Oglja ostalih predstavnikov listaste drevesne vegetacije (hrasta, črnega gabra, breze, jelše in topola) je le po nekaj primerkov. Iz družine rožnic je od skupno 11 primerkov oglja samo en pripadal črnemu trnu, večina pa zelo verjetno mokovcu. Tudi oglja iglastih predstavnikov je malo, saj je bilo v skupni vsebini le 2,5 % oglja jelke, dva primerka pa pripadata brinu.

Rimskodobni grobovi

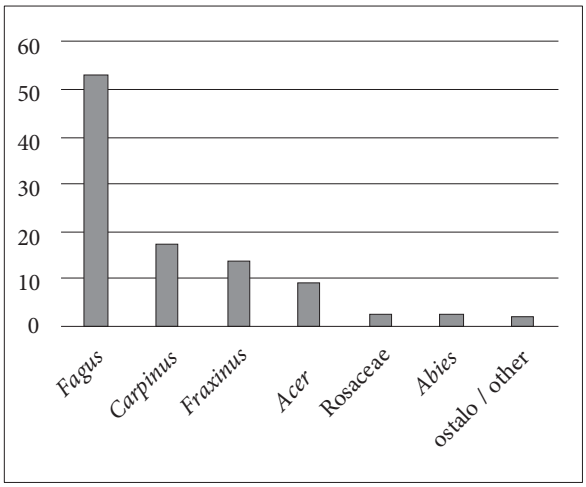
Analizirano je bilo tudi oglje iz 8 rimskodobnih grobov: R 1, 2, 3, 4, 6, 7, 8 in 17. Količina oglja se je v posameznih grobovih precej razlikovala. Od skupno analiziranih 480 primerkov jih je bilo samo v grobu R 4 kar 236 z anatomskimi znaki jesenovega lesa in 65 z

Tab. 2: Most na Soči – Repelc. Rezultati analize oglja iz železnodobnih grobov.
Tab. 2: Most na Soči – Repelc. Analysis results for the charcoal taken from Iron Age graves.

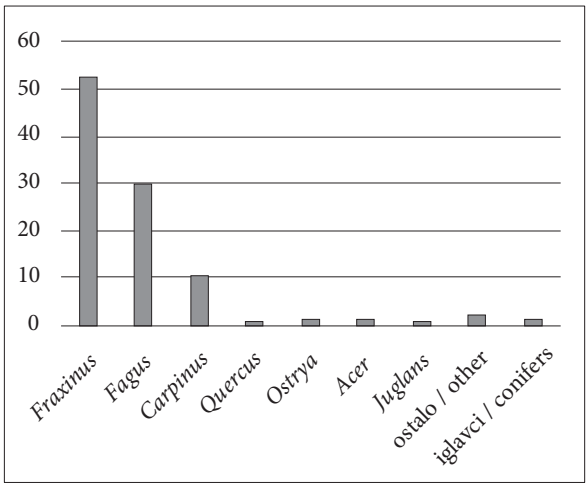
Grobovi / Graves

	10	**12**	**13**	**14**	**16**	**18**	**19**	**20**	**22**	**23**	**25**	**25B**	**26**	**28**	**33**	**34**	**35**	**37**	**38**	**40**	**41**	**45**	**48**	**51**	**52**		
Taksoni / Taxa																										Σ	%
Quercus sp. (hrast / oak)		1																								1	0,2
Fagus sylvatica (bukev / common beech)	39	11	2	15	19	25	15	7	35	8	5	2	13	2	3	3	3	7		1	19	3		15	2	254	52,7
Carpinus sp. (gaber / hornbeam)		3		13	1	11	1	6	23			1	5		3	2			9	2	1		3			84	17,4
Fraxinus sp. (jesen / ash)					24	1		2	22	4		2	3			2	5									65	13,5
Acer sp. (javor / maple)			2	3	2	3		7	7		1						7		7		3					42	8,7
Ostrya carpinifolia (črni gaber / hop-hornbeam)				1				2					2													5	1,0
Populus sp. (topol / poplar)																			4							4	0,8
Betula sp. (breza / birch)																	1									1	0,2
Alnus sp. (jelša / alder)																					1					1	0,2
Rosaceae (rožnice / rose family					3	1		1					5													10	2,1
Prunus spinosa (črni trn / blackthorn)															1											1	0,2
Abies alba (bela jelka / silver fir)			1	1				1	2	1			1						4				1			12	2,5
Juniperus (brin / juniper)									2																	2	0,4
Σ / %	39	15	5	33	49	41	16	26	91	13	6	5	29	2	7	7	16	7	24	3	24	3	4	15	2	482	99,9

Graf 2: Most na Soči – Repelc. Rezultati analize oglja iz 25 železnodobnih grobov (n = 482 primerkov).
Graph 2: Most na Soči – Repelc. Analysis results for the charcoal from 25 Iron Age graves (n = 482 specimens).



Graf 3: Most na Soči – Repelc. Rezultati analize oglja iz 8 rimskodobnih grobov (n = 480 primerkov).
Graph 3: Most na Soči – Repelc. Analysis results for the charcoal from 8 Roman period graves (n = 480 specimens).



Tab. 3: Most na Soči – Repelc. Rezultati analize oglja iz rimskodobnih grobov.
Tab. 3: Most na Soči – Repelc. Analysis results for the charcoal taken from Roman period graves.

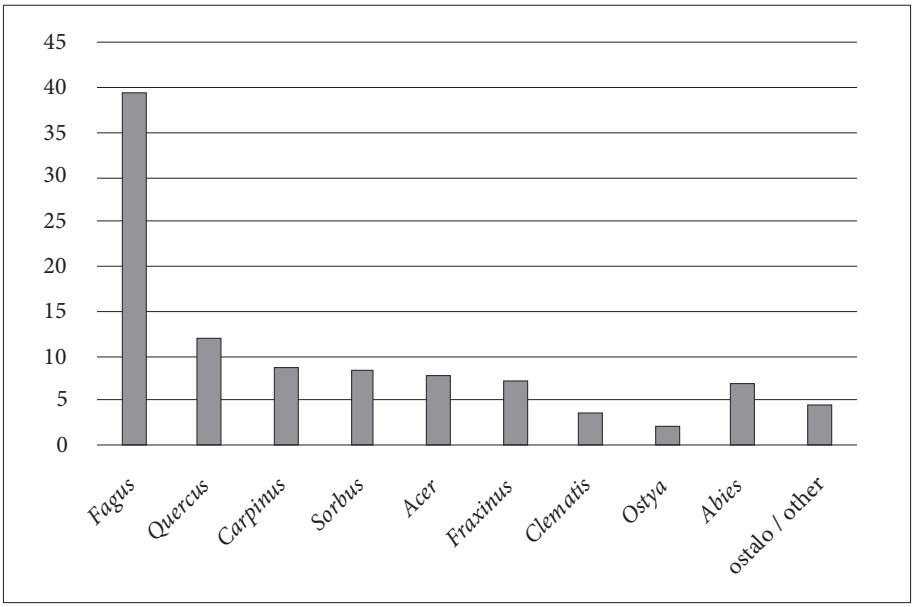
	Grobovi / Graves									
	1	**2**	**3**	**4**	**6**	**7**	**8**	**17**		
Taksoni / taxa									Σ	%
Quercus sp. (hrast / oak)				2				2	4	0,8
Fagus sylvatica (bukev / common beech)	1	11	45	65	8	6	3	5	144	30,0
Carpinus sp. (gaber / hornbeam)	4	8	20	4	3	4	1	6	50	10,4
Fraxinus sp. (jesen / ash)			10	236	1	4			251	52,3
Acer sp. (javor / maple)		3		3					6	1,3
Ostrya carpinifolia (črni gaber / hop-hornbeam)		1	5						6	1,3
Betula sp. (breza / birch)								1	1	0,2
Alnus sp. (jelša / alder)				2				3	5	1,0
Rosaceae (rožnice / rose family)		1			2				3	0,6
Prunus avium (divja češnja / wild cherry)				2					2	0,4
Juglans regia (oreh / walnut)	3								3	0,6
Abies alba (bela jelka / silver fir)								2	2	0,4
Taxus baccata (tisa / yew)							1	2	3	0,6
Σ / %	8	24	80	312	16	14	5	21	480	99,9

anatomskimi znaki bukovega lesa. Po nekaj primerkov je pripadalo hrastu, gabru, javorju, jelši in divji češnji. Tolikšna količina oglja jesena in tudi bukve v enem samem grobu je lahko naključje, morda pa sta bili ob pripravi grmade ti dve drevesni vrsti namerno izbrani. Prav tako bi bilo mogoče, da je bil v grob dodan večji kos pooglenelega jesenovega lesa, ki je kasneje razpadel na številne manjše koščke. Iz *tabele 3* in *grafa 3* je razvidno, da je bilo v vseh osmih grobovih ugotovljeno oglje bukve in gabra. Oglje drugih vrst drevja (hrasta, javorja, črnega gabra, breze, jelše, divje češnje, jelke in tise) pa je zastopano le s posamičnimi primerki. Zanimiva je

Tab. 4: Most na Soči – Repelc. Ugotovljeni taksoni v naključno odvzetem vzorcu oglja iz žganinske jame.
Tab. 4: Most na Soči – Repelc. Taxa in the randomly sampled charcoal from the cremation pit.

Taksoni / taxa	Σ	**%**
Fagus sylvatica (bukev / common beech)	271	39,4
Quercus sp. (hrast / oak)	82	11,9
Carpinus sp. (gaber / hornbeam)	59	8,6
Sorbus sp. (jerebika, mokovec / mountain ash, whitebeam)	57	8,3
Acer sp. (javor / maple)	53	7,7
Fraxinus sp. (jesen / ash)	48	7,0
Clematis vitalba (navadni srobot / old man's beard)	25	3,6
Ostrya carpinifolia (črni gaber / hop-hornbeam)	14	2,0
Ulmus sp. (brest / elm)	9	1,3
Alnus sp. (jelša / alder)	8	1,2
Corylus avellana (navadna leska / common hazel)	4	0,5
Salix sp. (vrba / willow)	3	0,4
Betula sp. (breza / birch)	2	0,3
Prunus avium (divja češnja / wild cherry)	2	0,3
Prunus spinosa (črni trn / blackthorn)	1	0,1
Abies alba (bela jelka / silver fir)	47	6,8
Taxus baccata (tisa / yew)	3	0,4
Σ / %	688	99,8

Graf 4: Most na Soči – Repelc. Rezultati analize oglja iz žganinske jame (n = 688 primerkov).
Graph 4: Most na Soči – Repelc. Analysis results for the charcoal from the cremation pit (n = 688 specimens).



prisotnost treh primerkov oglja orehovega lesa (*Juglans regia*) v grobu R 1. V tulcu (odlomljenega) bronastega ročaja (patere) z zaključkom v obliki ovnove glave, ki je bil najden v grobu R 3 (glej tu Mlinar, t. 17A: 1), je ostalo nekaj poogljenelega lesa, za katerega smo ugotovili, da pripada drenu (*Cornus mas*).

Jame

Poleg grobov so bile evidentirane še jame, ki niso opredeljene kot grobne, ker je bilo v njih le oglje in keramični odlomki (glej tu Mlinar, str. 93–94). Količina oglja je bila skromna, vsega skupaj 25 primerkov iz treh jam, zastopanost taksonov pa je sledeča: bukev (*Fagus sylvatica*) 11 primerkov, gaber (*Carpinus* sp.) 10, hrast (*Quercus* sp.) 2, jesen (*Fraxinus* sp.) 1 in jelka (*Abies alba*) 1.

Jama 11 (6 primerkov oglja): gaber 3, bukev 1, jesen 1, jelka 1.

Jama 27 (9 primerkov oglja): bukev 7, hrast 2.

Jama 29 (10 primerkov oglja): gaber 7, bukev 3.

Žganinska jama

Obsežna kotanja na severnem robu grobišča Repelc s površino okoli 12 m^2 in z okoli 30 cm debelo plastjo oglja naj bi bila kraj za sežiganje umrlih, morda tudi prostor za kultne obrede (glej tu Mlinar, str. 94–96). Iz te žganine je bilo pregledanega 2500 ml oglenega drobirja, iz katerega so bili za antrakološko analizo naključno izbrani dovolj veliki primerki oglja. Analiziranih jih je bilo 688. Daleč najpogostejše je oglje bukve (39,4 %), precej manj je hrasta, jesena, gabra, javorja, mokovca in jelke (*graf 4*). V majhnih odstotkih je prisotno še oglje bresta, črnega gabra, leske, breze, jelše, vrbe, divje češnje, črnega trna in tise (*tab. 4*). Kar nekaj primerkov pripada navadnemu srobotu, ki je pogosta ovijalka na drevju na gozdnih obronkih, po grmovju ali v živih mejah. S srobotom so morda povezali vejevje, ki so ga pripravili za grmado, na kateri so sežgali umrlega, ali pa za žgalne daritve.

MOST NA SOČI – LIPIČARJEV VRT

Med ledinama Pucarjev rob in Repelc je bil na Lipičarjevem vrtu odkrit in izkopan žgan rimskodobni grob. Poleg zanimive arheološke vsebine (Mlinar 2017; glej tu Mlinar, str. 99–100) je bilo zbranega tudi 1500 ml arheobotaničnega materiala (oglja). Naključno izbranih in analiziranih je bilo 424 primerkov, od tega jih je 415 pripadalo bukvi, 1 jelki, 8 primerkov pa smo zaradi slabše razpoznavne anatomske zgradbe določili v družino rožnic, (poddružina Pomoidae):

Fagus sylvatica (bukev)	415 primerkov oglja
Abies alba (jelka)	1 primerek oglja
Pomoidae (rožnice)	8 primerkov oglja

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Rezultati antrakološke analize z grobišča na Pucarjevem robu ter iz železnodobnih in rimskih grobov pa tudi iz žganinske plasti z Repelca kažejo, da je v vseh primerih zdaleč najbolje zastopano bukovo oglje.

TOLMIN

Na ravnici ob vzhodnem vznožju Kozlovega roba v Tolminu je bilo v letih od 1965 do 1970 izkopanih več kot 400 žganih grobov iz starejše železne dobe (Svoljšak 1966, 117–120; Svoljšak, Pogačnik 2002). Oglje iz 38 grobov je tedaj analiziral Alojz Šercelj, njegovo poročilo je bilo objavljeno leta 2002, a žal nepopolno in brez komentarja, zato na tem mestu predstavljamo rezultate antrakološke analize s teh izkopavanj v *grafu 5*. Količina oglja je bila glede na število grobov razmeroma majhna in ni znano, ali so bili arheobotanični ostanki iz grobov v celoti pobrani in na kakšen način, prav tako ne, ali so bili v analizo oddani vsi ali morda le izbrani primerki.

Skupno je bilo analiziranih 238 primerkov oglja. Za sežiganje pokojnih je bil zelo verjetno uporabljen les iz bližnje okolice, pridobljen od drevja, ki je poraščalo vznožje in pobočja Kozlovega roba. Vsebina oglja kaže precejšnjo pestrost drevesnih vrst. Znatno prevladuje oglje gabra (*Carpinus* sp.) in jesena (*Fraxinus* sp.), precej manj je oglja javorja (*Acer* sp.). Z vrednostmi, nižjimi od 5 odstotkov, je zastopano oglje topola (*Populus* sp.), mokovca (*Sorbus aria*), vrbe (*Salix* sp.) ter pravega kostanja (*Castanea sativa*). Družino rožnic (Rosaceae) poleg že omenjenega mokovca zastopajo še divja češnja (*Prunus avium*), rešeljika (*Prunus mahaleb*), lesnika (*Malus sylvestris*) in glog (*Crataegus* sp.). Večinoma s posameznimi primerki je zastopano še oglje hrasta (*Quercus* sp.), lipe (*Tilia* sp.), črnega gabra (*Ostrya carpinifolia*), bresta (*Ulmus s*p.), leske (*Corylus avellana*) in drena (*Cornus* sp.).

Iz popisa današnje drevesne vegetacije Kozlovega roba, ki ga je naredil Dakskobler,[1] je razvidno, da je danes tu bukovo rastišče, saj na osojni strani povsem prevladuje bukev, na prisojni strani pa uspevajo črni gaber, lipovec, mali jesen, beli gaber, ostrolistni javor, posamično tudi hrasti (graden, dob in celo cer). Prav tako je zabeležen kostanj, ki uspeva še ponekod v okolici Tolmina.

Vsekakor pa bi bili zanimivi rezultati antrakološke analize, če bi odkrili in raziskali tolminsko naselbino, ki ji je to grobišče pripadalo. Koliko lesa – in kakšne vrste – je bilo uporabljenega za njeno gradnjo? Ali bi bilo mogoče, da je bila bukev na tem območju na začetku železne dobe že iztrebljena, kar bi lahko bil tudi eden od vzrokov za selitev tolminske skupnosti in nastanek nove naselbine na Mostu na Soči. Težko je namreč razložiti dejstvo, da v celotni vsebini arheobotaničnega materiala

[1] Igor Dakskobler, sodelavec Biološkega inštituta Jovana Hadžija ZRC SAZU, mi je popis pisno posredoval.

iz žganih grobov med 238 primerki oglja niti eden ne pripada bukvi. Prav tako ni oglja nobene od vrst iglastega drevja. Danes je tu sicer že kar precej jelke, ki so jo začeli saditi v bližnji preteklosti in se že tudi dobro pomlajuje, kot ugotavlja Dakskobler.[2]

JEROVCA NA ŠENTVIŠKI PLANOTI

Nekoliko oddaljeno od središča posoške (svetolucijske) železnodobne skupnosti na Mostu na Soči je bilo leta 2007 z zaščitnimi arheološkimi izkopavanji Tolminskega muzeja raziskano plano žgano grobišče v Jerovci na Šentviški planoti. Odkritih je bilo 22 grobov, ki jih datirajo v čas od konca 6. do 4. stol. pr. n. št. (Laharnar, Mlinar 2011). Severovzhodni del te kraške planote na nekaj manj kot 800 metrih nadmorske višine ponuja (morda prvenstveno iskalcem železove rude) ugodne razmere za živinorejo, poljedelstvo ali sadjarstvo.

Iz 12 grobov je bilo analiziranih 343 primerkov oglja, od katerih jih je imelo 325 anatomske značilnosti lesa bukve (*Fagus* sp.), po nekaj primerkov je pripadalo še gabru (*Carpinus* sp.) in jerebiki (*Sorbus* sp.) ter po eden jesenu (*Fraxinus* sp.) in javorju (*Acer* sp.) (Culiberg 2011). Zastopanost oglja bukovega lesa je v grobovih 95 %, kar pomeni, da je na planoti, kjer je zaživela nova naselbina, prevladoval bolj ali manj čisti bukov gozd.

Četudi je bila bukev zaradi poselitve, pridobivanja odprtih površin za pašnike, morda tudi za polja in ne nazadnje zaradi morebitne železarske dejavnosti gotovo precej izsekana, še danes tu prevladuje bukov gozd v različnih združbah. Na območjih, kjer se na primer danes zaraščajo pašniki, je prav tako najpogostejše bukovo mladje.

Zanimive so tudi karpološke najdbe. V grobovih 6 in 18 sta bili najdeni na pol ožgani polovici lupine lešnika (*Corylus avellana*), v grobu 1 pa nekoliko manj ožgana koščica slive (*Prunus domestica*). Poleg teh najdb so bili v vzorcih grude drobci zoglenelih in nezoglenelih kosti, zato menimo, da so sočasne z arheološko vsebino grobov.

ČADRG – LAZE I

Na planoti na okoli 700 metrih nadmorske višine nad levim bregom Tolminke so bile na travniški površini blizu vasi Čadrg izkopane tri jame, ki so vsebovale arheološke ostanke iz pozne halštatske in latenske dobe (Mlinar, Turk 2016, 20–21). Dve sta interpretirani kot grobova (grob 2 in 3), medtem ko v jami 1 sežganih človeških kosti ni bilo. Iz vseh treh jam je bilo zbrano in analizirano oglje.

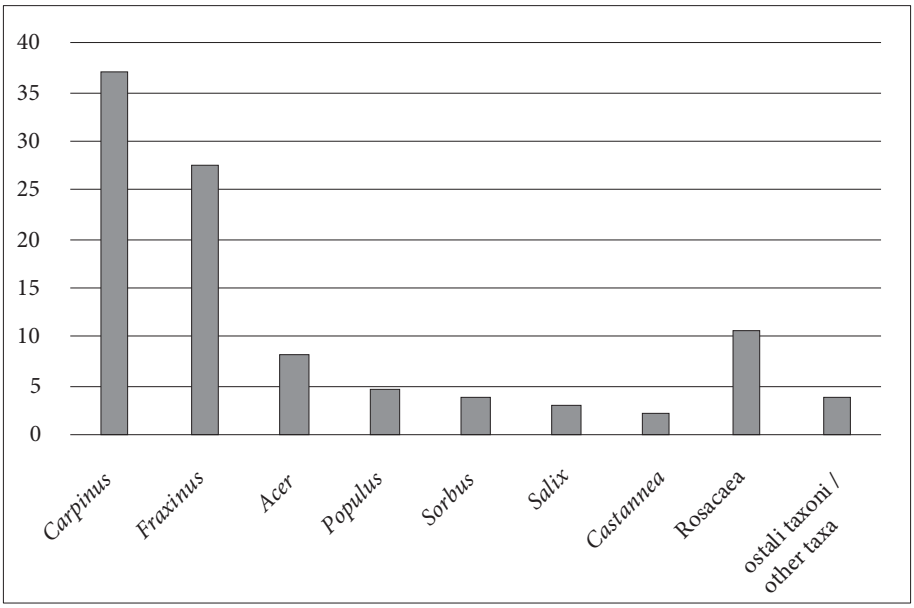
Jama 1: Bukev (*Fagus sylvatica*) 26 primerkov, gaber (*Carpinus* sp.) 17, jesen (*Fraxinus* sp.) 2, lipa (*Tilia* sp.) 3, tisa (*Taxus baccata*) 1.

Grob 2: Bukev (*Fagus sylvatica*) 58, gaber (*Carpinus* sp.) 20, lipa (*Tilia* sp.) 7, jelša (*Alnus* sp.) 4, javor (*Acer* sp.) 1, jerebika/mokovec (*Sorbus aucuparia / aria*) 1; smreka (*Picea abies*) 6, jelka (*Abies alba*) 4, bor (*Pinus* sp.) 1, brin (*Juniperus communis*) 1; več primerkov je bilo prepoznanih le kot iglavec.

Grob 3: 1800 ml oglja; od naključno izbranih primerkov jih je 307 pripadalo bukvi (*Fagus sylvatica*) in 7 gabru (*Carpinus* sp.).

[2] Te podatke mi je posredoval osebno iz njegovih lastnih evidenc, za kar se mu zahvaljujem.

Graf 5: Tolmin. Rezultati analize oglja iz 38 grobov (n = 238 primerkov).
Graph 5: Tolmin. Analysis results for the charcoal from 38 graves (n = 238 specimens).



Iz jame 1 smo v analizo prejeli tudi košček preperelega in s sedimentom impregniranega lesa iz tulca sulične osti. V prečnem prerezu so bili vidni radialno razvrščeni nizi odprtin trahej in agregirani trakovi, kar je značilno za les gabra, jelše ali leske. Košček lesa smo nato namakali v blagi raztopini solne kisline, s katero smo nekoliko očistili karbonatno impregnacijo. Z natančnim pregledovanjem je bilo v tangencialnem preseku dokaj razločno zaznati nekaj trahej, kjer na stikih zagotovo ni bilo videti lestvičastih perforacij, značilnih za jelšo in lesko. Na trahejah so bile tu in tam zaznavne tudi spiralne odebelitve, vse to pa so značilnosti gabrovega lesa (*Carpinus* sp.).

Manj zanesljiva je določitev vrstne pripadnosti drobca lesa v suličnem kopitu iz groba 3. Deloma je bil impregniran tudi z železovim oksidom in tam struktura lesa ni bila razvidna. V prečnem prerezu so bile vidne razmeroma redke, difuzno razporejene posamične pore. Z natančnim pregledovanjem v tangencialnem prerezu je bilo na enem mestu opaziti morda ostanke večjega števila letvic na stičiščih trahej, kar je značilno za les drena (*Cornus* sp.). Zgolj na osnovi razporeditve por v prečnem prerezu pa bi to lahko bil tudi les javorja (*Acer* sp.).

SRPENICA

Na ledini Ograjenca blizu naselja Srpenica v dolini Soče je bil leta 2003 po naključni najdbi odlomkov bronaste situle odkrit prvi žgani grob (grob 1). Ob kopanju jarka za vodovod sta bila leta 2008 odkrita še dva (grob 2 in grob 3), oddaljena približno 80 m od prvega. To grobišče, ki je okvirno datirano v čas med 6. in 4. stol. pr. n. št., je eno najseverneje ležečih posoških najdišč iz starejše železne dobe (Mlinar 2009–2010). Analizirano je bilo le oglje iz grobov 2 in 3.

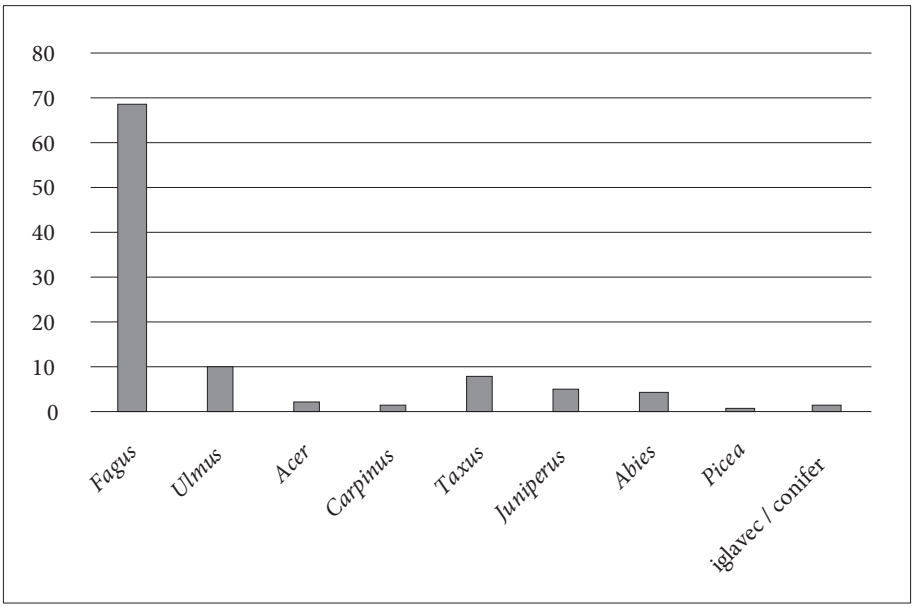
Grob 2: Od 35 analiziranih primerkov oglja jih je 31 pripadalo bukvi (*Fagus sylvatica*) in 4 jelki (*Abies alba*).

Grob 3: Tudi tu je prevladovalo oglje bukve (*Fagus sylvatica*) z 235 primerki; štirje so pripadali brestu (*Ulmus* sp.), po en pa jelki (*Abies alba*), gabru (*Carpinus* sp.) in tisi (*Taxus baccata*). Vmes je bilo tudi nekaj drobcev sežganih kosti.

JELENŠEK NAD GODOVIČEM

Najbolj oddaljena od središča posoške (svetolucijske) skupnosti na Mostu na Soči je bila naselbina na hribu Jelenšek nad Godovičem. V sedlu pod vrhom je bilo naključno odkrito pripadajoče grobišče, kjer so bila leta 1993 izvedena zaščitna arheološka izkopavanja (Bratina 1994; 1997; Svoljšak 1997). Odkritih je bilo 37 žganih grobov z bogatimi pridatki (v moških grobovih orožje in orodje, v ženskih nakit), datirani pa so v 4. stol. pr. n. št. Oglje iz 17 grobov sta analizirala A. Šercelj in M. Culiberg z Biološkega inštituta Jovana Hadžija ZRC SAZU. Rezultati antrakološke analize še niso bili objavljeni in so na tem mestu prikazani na *grafu 6*. Pregledanih je bilo 359 primerkov oglja. Z nekaj manj kot 70 % je zastopano oglje bukve (*Fagus sylvatica*) in z 9,7 % oglje bresta (*Ulmus* sp.), medtem ko je oglje gabra (*Carpinus* sp.), javorja (*Acer* sp.) in smreke (*Picea* sp.) sporadično. Zanimive so razmeroma visoke vrednosti tise (*Taxus baccata*), ki je zastopana s 7,8 %. Ta vrsta iglavca uspeva raztreseno po vsej Sloveniji, razmeroma

Graf 6: Jelenšek nad Godovičem. Rezultati analize oglja iz 17 grobov (n = 359 primerkov).
Graph 6: Jelenšek above Godovič. Analysis results for the charcoal from 17 graves (n = 359 specimens).



pogosta pa je v severozahodnem delu alpskega sveta. Najraje raste v pasu bukovih in mešanih iglastih gozdov, tudi v okolici Godoviča. Les je trden in prožen in se lepo obdeluje. Že od nekdaj so tiso močno izkoriščali, saj je bil les primeren za najrazličnejše izdelke, med drugim za izdelavo lovnega orožja, kot so kopja ali loki (Brus 2004, 102–103). Na kolišču Stare gmajne na Ljubljanskem barju je bil na primer najden več kot 5000 let star otroški lok iz tisovine (Tolar, Zupančič 2009, 241–242), v strugi Ljubljanice pri Sinji Gorici pa celo okoli 40.000 let stara lesena konica prav tako iz tisovine (Gaspari, Erič, Odar 2012). Izdelki iz tisovine ali njihovi fragmenti so znani tudi z mlajših arheoloških najdišč, najpogosteje le oglje tisinega lesa. Verjetno je bila tisa v času obstoja naselbine na Jelenšku v pretežno bukovem gozdu pogostejša kot danes, zato je mogoče, da so njen les uporabljali za različne dele orodja ali orožja. V primerih, ko so te predmete pridali pokojniku ob sežigu, so leseni deli zgoreli in so ostali le drobci oglja.

ZAKLJUČKI

Današnja vegetacija je rezultat naravnih procesov, v veliki meri pa tudi človekovih dejavnosti v bližnji in daljni preteklosti. Pelodna analiza jezerskih usedlin ali gozdnih tal te spremembe zaznava in omogoča vpogled v sukcesijo naseljevanja posameznih tipov gozdnih združb. Težko pa bi s pelodno analizo ugotovili sestoj vegetacije v neposredni okolici naselbine, saj podaja sliko vegetacije širšega območja. Po drugi strani lesno oglje ali drugi rastlinski makroostanki z arheoloških najdišč, ki so časovno sicer dobro opredeljeni, dokazujejo rastlinski pokrov bolj ali manj bližnjega okolja naselbine. Zato je velika verjetnost, da je večina drevesnih ali grmovnih vrst, ugotovljenih na arheoloških najdiščih, uspevala v njihovi bližini, ne ve pa se, v kolikšnem obsegu. Treba je upoštevati dejstvo, da je bil za gradnjo hiš izbran le obstojnejši les, kot je hrastov, bukov ali smrekov in še kakšen, medtem ko je bil za sežiganje pokojnih ali žgalnodaritvene obrede ter seveda za kurjavo uporabljen širši izbor lesnih vrst. A kot kažejo analize, so tudi v tem primeru največkrat posegali po bukovem lesu. Tako je bila lahko v daljšem časovnem obdobju, več stoletij, kolikor dolgo je živela naselbina, določena vrsta drevja iztrebljena do te mere, da se je gozdni sestoj v okolici precej spremenil.

Pelodna analiza številnih vzorcev jezerske krede vzdolž Zgornjega Posočja je pokazala, da gre večinoma za starejše sedimente, v katerih je prevladovala hladnodobna vegetacija z borom in brezo. Od konca pleistocena in v začetnih obdobjih holocena je bilo naseljevanje gozdne vegetacije še klimatsko pogojeno, takšno vegetacijo smo ugotovili v vzorcih iz 11 m visokega profila jezerske krede v bregu Soče pri Srpenici. Radiokarbonska analiza je potrdila vegetacijo iz poznega glaciala, to je obdobja, ko se je podnebje začelo postopno ogrevati (Bavec et al. 2005; Šercelj 1996). V Zadnji Trenti smo v vzorcu iz 1,5 m visokega profila jezerske krede ob kosu preperelega debla smreke ali macesna z radiokarbonsko starostjo okoli 7000 let pred sedanjostjo ugotovili poleg peloda bora, smreke in jelke tudi pelod listavcev tipične holocenske vegetacije: leska, hrast, lipa, brest, javor in celo bukev (Šercelj, Culiberg).[3] V vzorcu sive peščene karbonatne gline iz okolice Kobarida je Šercelj (1981, 135) ugotovil holocensko vegetacijo s smreko, jelko in bukvijo, kar že kaže na prisotnost bukovo-jelove združbe (Abieti-Fagetum). Vendar je zaradi nepoznavanja sukcesij menil, da bi lahko to bila ali primarna bukovo-jelova združba, ki je dosegla končno razvojno stopnjo že v prvi polovici postglaciala, ali pa je šlo za ponovno obnavljanje po njeni degradaciji zaradi močne poseljenosti v bronasti in predvsem v starejši železni dobi v okolici Tolmina. Mlajši sedimenti, ki bi bili primerni za pelodno analizo in v katerih bi lahko sledili spremembam vegetacije skozi daljše obdobje, zlasti od bronaste dobe naprej, doslej še niso bili najdeni.

Potencialna naravna vegetacija osrednjega dela Posočja je bukov gozd, gotovo pa je bukev v različnih obdobjih poseljevanja utrpela precejšnje krčenje. Za gradnjo naselbin so bile potrebne večje količine lesa, poleg tega so naseljenci z obsežnimi goloseki pridobivali poljske in pašne površine. Tudi za grmade, na katerih so sežigali preminule, je bil najpogosteje uporabljen prav les bukve, kar dokazuje analiza oglja iz grobov večine raziskanih nekropol. Izjema je le tolminska, kjer ni bilo niti enega primerka oglja bukve. Le ugibamo lahko, ali je bila bukev v okolici Tolmina v pozni prazgodovini že precej iztrebljena. K razjasnitvi tega vprašanja bi veliko prispevala antrakološka analiza ostankov tolminske naselbine, če bi bila ta odkrita in raziskana. Pomanjkanje gradbenega lesa bi lahko bil morda tudi eden od vzrokov, da se je tolminska skupnost okoli 7. stol. pr. n. št. preselila na Most na Soči. Analiza oglja iz železnodobne naselbine na Mostu na Soči je pokazala, da je bil za gradnjo najpogosteje uporabljen les hrasta, jelke in bora in mnogo manj bukve (Motella de Carlo 2018a, 361–402). Morda je bila bukev tudi tu že v bronasti dobi precej iztrebljena, degradirana ali denudirana tla pa je prerastel hrast, ki je danes tu zopet bolj redek.

Vendar analize oglja iz železnodobnih grobov na Pucarjevem robu in Repelcu kažejo, da je bila bukev v okolici Mosta na Soči še vedno prisotna v tolikšni meri, da je bil njen les uporabljen kot glavno kurivo pri sežiganju umrlih. Nekoliko drugačno sliko kaže analiza oglja iz osmih rimskodobnih grobov z Repelca, ki jo nekoliko "izkrivlja" vsebina oglja iz enega samega groba (grob R 4), v katerem je znatno prevladovalo oglje jesena, a je bilo precej tudi oglja bukve. Na desnem bregu Idrijce je bilo odkrito še eno grobišče ob rimski naselbini,

[3] Poročilo ni objavljeno, oddano je bilo J. Kunaverju.

tj. nekropola II, datirana v čas med 1. stol. pr. n. št. in 1. stol. n. št. Iz nje je Sila Motella de Carlo analizirala 427 primerkov oglja iz 53 grobov. Iz objavljenega grafa (Motella de Carlo 2018b, 227, Fig. 7) je razvidno, da je bukev zastopana z več kot 30 odstotki, manj je bilo gabra in javorja, še manj oreha in jesena, ostale vrste, med drugim hrast, pa so zastopane bolj ali manj sporadično. Da je bila bukev bolj ali manj prisotna v vseh obdobjih od bronaste do rimske dobe in da je kljub morebitnim večjim krčenjem kmalu nazaj porasla svoja rastišča, dokazuje večina antrakoloških analiz iz Posočja.

Drugače je bilo na planotah, kjer so nastale manjše naselbine (npr. Čadrg, Jerovca), verjetno predvsem zaradi nabiranja železove rude pa tudi pašništva in izkoriščanja gozdov, vendar tamkajšnji pretežno bukovi gozdovi niso utrpeli tolikšne škode.

Ob vrstno dokaj enotni vsebini oglja iz grobov naj omenimo še nekaj drobnih posebnosti. Na Pucarjevem robu na Mostu na Soči so bili v grobu PR 25 ugotovljeni štirje koščki oglja z značilnimi znaki lesa vinske trte (*Vitis* sp.). V neolitskih, železnodobnih, posebno pa v rimskih arheoloških najdiščih so peške grozdnih jagod sicer pogoste, medtem ko so najdbe oglja olesenelih stebel precej bolj redke. Da bi tu gojili vinsko trto, je malo verjetno, kajti pešk ni bilo niti med semeni in plodovi iz naselbine na Mostu na Soči (Motella de Carlo 2018, 381). Tudi danes vinska trta tu ni pogosta, razen kakšne brajde ob hiši. Zato bi morda les iz groba PR 25 lahko pripadal divji vinski trti (*Vitis vinifera* subsp. *sylvestris*), ki kot ovijalka uspeva v mešanem gozdu na gruščnati podlagi. Danes je to redka in zaščitena vrsta le z nekaj znanimi nahajališči, tudi v dolini Idrijce (Dakskobler 1995; 2008; Piltaver 2007).

Na Repelcu so bili v rimskem grobu R 1 ugotovljeni trije primerki oglja orehovega lesa, medtem ko so bila v več hišah železnodobne naselbine na nasprotnem bregu Idrijce najdena jedrca (Motella de Carlo 2018a, 379) in fragmenti lupine orehovih plodov (Tolar 2018, 449). Kdaj in kako se je oreh razširil v evropski prostor, se natančno ne ve, so pa iz mlajše železne dobe znane najdbe pooglenelih ostankov orehovih plodov. Zagotovo se je oreh zelo razširil z Rimljani, ki so ga zelo cenili (Zohary, Hopf 2004, 188–189). Oreh uspeva v Posočju tudi danes in se posamično širi celo v gozdove, kot opaža Dakskobler.[4]

Omenjeno je že bilo, da v nekaj litrih prebranega oglenega drobirja iz sežigališča na Repelcu semen ni bilo z izjemo nekaj zrn prosa (*Panicum* sp.). Večje količine semen, zlasti žitnih zrn, in fragmentov plodov je bilo zbranih večinoma v hiši 6 v naselbini na Mostu na Soči (Motella de Carlo 2018a, 379–383; Tolar 2018, 445–452).

Iz Jerovce na Šentviški planoti pa izvira iz groba 1 ena najbolj zanimivih in v Sloveniji redkih karpoloških najdb, tj. koščica slive (*Prunus domestica*). V Evropi so najdbe koščic znane že iz neolitika in bakrene dobe. Poreklo domače slive arheobotaniki razlagajo različno. Nekateri menijo, da je bila vzgojena s križanjem različnih vrst iz rodu sliv in v neolitiku prinesena v Evropo, drugi pa, da je v srednji Evropi prvotna vrsta, kjer ji najbolj ustreza zmerna klima (Zohary, Hopf 2004, 179–181, Woldring 1997–1998, 547). Torej bi bilo možno, da so železnodobni naseljenci na Jerovci, ki jih je tja privabila verjetno železova ruda, sadili tudi sadno drevje, možno pa je tudi, da so pridelke in plodove zamenjevali z dolinskimi prebivalci. Dve ožgani polovici koščic lešnikov (*Corylus avellana*) s tega najdišča pa kažeta na živinorejsko dejavnost, saj se leskovo grmovje dokaj kmalu naseli na pašnih površinah.

[4] Po podatkih iz njegove lastne evidence.

ARCHAEOBOTANICAL EVIDENCE FROM SELECT SITES OF THE POSOČJE IRON AGE COMMUNITY

Translation

The Iron Age cemetery at Most na Soči ranks among the largest prehistoric necropoleis investigated in Europe, thus far revealing more than 6000 burials (Dular, Tecco Hvala 2018, 9). Its remains are still coming to light during the rescue investigations in advance of construction works taking place in the area of the modern town. One such investigation was conducted between 2000 and 2002, when the colleagues of the Tolminski muzej brought to light 36 Iron Age graves at Pucarjev rob, as well as 54 graves and pits from the Iron Age and the Roman period at Repelc. The northern edge of the Repelc site even revealed a cremation pit that indicates, in both its extent and quantity of charcoal, that the spot long served to cremate the dead, possibly also as a place where cult rituals were being performed.

The investigated burials revealed a wealth of grave goods, but also archaeobotanical remains. The latter comprise the charcoal of tree and shrub species, but practically no seeds or fruits with the exception of a few grains of millet. In addition to Most na Soči, archaeobotanical analyses have also been conducted on the remains from some other cemeteries of the Posočje Iron Age community, all with the aim of studying the human impact on the environment in different periods.

ANTHRACOLOGICAL ANALYSIS

Charcoal specimens were examined under the Ortholux light microscope using the Ultropak incident light illuminator, in most cases in all three sections: transverse, radial and tangential. The characterisation of wood species was performed based on the anatomical features as defined by Greguss (1954) and Schweingruber (1978; 1990) and even more on the personal reference collection of recent wood species (Culiberg). Numerous specimens exhibited excessive weathering or sediment-filled wood fibres that made characterisation impossible. The results of the anthracological analysis are shown in tables and graphs according to excavation units. Most of the charcoal specimens were taxonomically identified to the level of the genus; the characterisation of the species was for the most part unreliable as the specimens were predominantly in the 0.5–1 cm size range, where there is little difference in the anatomy of the species of any particular genus. The species is only given for the taxa where a genus consists of a single species (e.g. *Fagus sylvatica*, *Abies alba*) and for the species where the characterisation was possible and necessary (e.g. the *Prunus* genus: *Prunus spinosa*, *Prunus avium*).

MOST NA SOČI – PUCARJEV ROB

The charcoal from 27 Iron Age graves (PR 1, 2, 3, 4, 5A, 6, 7, 8, 10, 11, 12, 14, 16, 17, 18, 20, 21, 22, 23, 25, 28, 29, 31, 32, 33, 34 and 35) at this site was collected by water sieving. The anthracological analysis examined a total of 254 specimens. The results are shown in *Table 1* and *Graph 1*. The charcoal from two graves (PR 4 and 7) was completely weathered and therefore impossible to characterise, while some other graves only yielded a limited number of specimens suitable for analysis as others were only lumps of sandy sediment with bits of charcoal.

The analysis established 18 taxa. By far the best represented is *Fagus* (37.4%), followed by other deciduous taxa: *Carpinus* (16.5%), *Quercus* (9.4%), *Fraxinus* (9.4%), *Acer* (4.7%), *Salix* (2.0%) and *Alnus* (1.2%). Two of the several subfamilies (Martinčič et al. 1999) of the Rosaceae family (11.0%) are also represented: Maloidae and Prunoidae. The Maloidae subfamily consists of the *Sorbus*, *Pyrus*, *Malus*, *Crataegus* and several other geni, which have a very similar wood anatomy, making the distinction unreliable. However, a number of less prominent anatomical features suggest that the greatest share of the Rosaceae charcoal belongs to *Sorbus aria*, which is a pioneer species that frequently comes to dominate areas in the process of being overgrown. The Prunoidae subfamily includes a single genus, *Prunus*, the anatomical structure of which differs considerably from that of the Maloidae subfamily (in the several-cell wide rays and the spiral thickenings in vessels). A single charcoal specimen, from Grave PR 35, belongs to

Prunus avium, which frequently grows in lowland durmast oak-hornbeam forests or middle-mountain beech forests either individually or in small groups (Brus 2004, 198). The sporadically occurring taxa make up 4.4% of the total sum and comprise *Ostrya carpinifolia*, *Ulmus*, *Betula*, *Corylus avellana*, *Populus*, as well as *Berberis* and *Evonymus* as shrub species. Particularly intriguing is the presence, in Grave PR 25, of four specimens of grapevine charcoal, most likely wild grapevine (*Vitis vinifera* ssp. *sylvestris*). Of coniferous trees, only *Abies* is represented, with mere 2%.

MOST NA SOČI – REPELC

The finds at Repelc date to several periods of prehistory (Bronze, Early and Late Iron Ages) and the Roman period. They consist of habitation traces, graves, pits and a cremation pit (see here Mlinar, pp. 117–118).

Bronze Age habitation layer

The deepest cultural layer (SE 5) revealed scarce Bronze Age remains. The remains of a house from the Younger Bronze Age were also found on the promontory overlooking the confluence of the Rivers Idrijca and the Soča (Dular 2018, 147), which suggests that both the left and the right bank of the Idrijca were inhabited in the Bronze Age (see here Mlinar, pp. 118–119. Only a modest amount of charcoal was obtained from this layer, belonging to *Fagus* (19 specimens), *Quercus* (11 specimens) and *Abies* (4 specimens). This may indicate the existence of a beech-fir forest (Abieti-Fagetum), possibly already slightly depleted and oak forest taking its place.

Iron Age cremation burials

A total of 482 charcoal specimens (*Tab. 2*) were analysed from 25 Iron Age graves (R 10, 12, 13, 14, 16, 18, 19, 20, 22, 23, 25, 25B, 26, 28, 33, 34, 35, 37, 38, 40, 41, 45, 48, 51 and 52). Just over half of the charcoal belongs to *Fagus* (52.6%), 17.4% to *Carpinus*, 13.5% to *Fraxinus* and 8.7% to *Acer* (*Graph 2*). Only a few specimens belong to other deciduous species (*Quercus*, *Ostrya carpinifolia*, *Betula*, *Alnus* and *Populus*). The Rosaceae family is represented by 11 specimens, of which one belongs to *Prunus spinosa* and the majority most likely to *Sorbus aria*. The coniferous canopy is also poorly represented, with only 2.5% of fir and two specimens belonging to juniper.

Roman period burials

The analysis included the charcoal from eight graves from the Roman period: R 1, 2, 3, 4, 6, 7, 8 and 17. The amount of charcoal differed considerably from grave to grave. Of the total of 480, Grave R 4 alone contained as many as 236 specimens, with anatomical features of *Fraxinus* and 65 with those of beech. Several specimens also belonged to *Quercus*, *Carpinus*, *Acer*, *Alnus* and *Prunus avium*. It is possible that such a large quantity of *Fraxinus* and *Fagus* charcoal in a single grave is a matter of coincidence, though it is also possible that these two tree species were either intentionally selected for the funeral pyre or a large piece of charred ash wood was intentionally placed into the grave and later disintegrated into smaller pieces. *Table 3* and *Graph 3* show that the charcoal of *Fagus* and *Carpinus* was present in all eight graves. The charcoal of other tree species (*Quercus*, *Acer*, *Ostrya carpinifolia*, *Betula*, *Alnus*, *Prunus avium*, *Abies* and *Taxus baccata*) is represented with a few specimens. Interestingly, Grave R 1 revealed three charcoal pieces of *Juglans regia*. In addition, the charred wood in the socket of a (broken off) bronze handle (of a patera) with a ram-head terminal, found in Grave R 3 (see here Mlinar, Pl. 17A: 1), was identified as *Cornus mas*.

Pits

The cemetery also included pits that did not contain human bone remains, only charcoal and pottery shards (see here Mlinar, pp 119–120). The quantity of the recovered charcoal is modest, altogether 25 specimens from three pits, which belong to the following taxa: 11 to *Fagus sylvatica*, 10 to *Carpinus*, 2 to *Quercus*, 1 to *Fraxinus* and 1 to *Abies*.

Pit 11 (6 specimens): *Carpinus* 3, *Fagus* 1, *Fraxinus* 1, *Abies* 1.

Pit 27 (9 specimens): *Fagus* 7, *Quercus* 2.

Pit 29 (10 specimens): *Carpinus* 7, *Fagus* 3.

Cremation pit

The northern edge of the Repelc cemetery revealed a vast depression measuring some 12 m^2 and containing a roughly 30 cm thick layer of charcoal. The pit was presumably intended for cremation, but possibly also a place where cult rituals were being performed (see here Mlinar, p. 120). The analysis examined 2500 ml of charcoal, with the sufficiently large specimens selected for anthracological analysis. The 688 large specimens belong by far the most commonly to *Fagus* (39.4%) and considerably less to *Quercus*, *Fraxinus*, *Carpinus*, *Acer*, *Sorbus* and *Abies* (*Graph 4*), in small amounts also to *Ulmus*, *Ostrya carpinifolia*, *Corylus avellana*, *Betula*, *Alnus*, *Salix*, *Prunus avium*, *Prunus spinosa* and *Taxus baccata* (*Tab. 4*); several specimens also to *Clematis vitalba*, which commonly climbs trees at forest fringes, but also shrubs and hedges. *Clematis vitalba* may have been used to bind the branches prepared for the pyre or for burnt offerings.

MOST NA SOČI – LIPIČARJEV VRT

The site of Lipičarjev vrt lies between Pucarjev rob and Repelc. It revealed a Roman period cremation burial with intriguing archaeological (Mlinar 2017; see here Mlinar, pp. 146–147), as well as 1500 ml of archaeo-

botanical finds (charcoal). Of the latter, 424 specimens were randomly selected and analysed, revealing that 415 belonged to *Fagus*, 1 to *Abies* and 8 more broadly to the Rosaceae family (Pomoidae subfamily) as their anatomical structure was less characteristic:

Fagus sylvatica	415 specimens
Abies alba	1 specimen
Pomoidae	8 specimens

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The results of the anthracological analysis of the plant remains from Pucarjev rob (cemetery) and Repelc (Iron Age and Roman period graves and a cremation pit) reveal beech to be far the best represented species.

TOLMIN

The flatland along the east foot of the Kozlov rob hill in Tolmin is the site where more than 400 cremation burials from the Early Iron Age were excavated between 1965 and 1970 (Svoljšak 1966, 117–120; Svoljšak, Pogačnik 2002). Charcoal specimens were taken from 38 graves. At the time, Alojz Šercelj analysed the charcoal specimens from 38 graves. His report was published in 2002 (in Svoljšak, Pogačnik), but was unfortunately incomplete and without a commentary. The complete results of the anthracological analysis for this site are given here, in *Graph 5*. The amount of charcoal was relatively small given the number of graves and it is unclear how the archaeobotanical remains were collected and whether they were gathered in their entirety; it is also unclear whether all specimens were analysed or only a selection.

A total of 238 charcoal specimens were analysed. For building funeral pyres, people very likely used the wood available in the vicinity, i.e. on the foot and slopes of Kozlov rob. The analysis shows a great diversity of tree species, with a considerable predominance of *Carpinus* sp. and *Fraxinus* sp., considerably less of *Acer* sp. Represented with values below five percent are *Populus* sp., *Sorbus aria*, *Salix* sp. and *Castanea sativa*. In addition to the already mentioned *Sorbus aria*, the Rosaceae family also includes *Prunus avium*, *Prunus mahaleb*, *Malus sylvestris* and *Crataegus* sp. Some species are represented merely with individual specimens: *Quercus* sp., *Tilia* sp., *Ostrya carpinifolia*, *Ulmus s*p., *Corylus avellana* and *Cornus* sp.

Dakskobler's list[1] of the tree species now growing on Kozlov rob shows that the hill is beech habitat today, with beech completely dominating on the shady sides and *Ostrya carpinifolia*, *Tilia cordata*, *Fraxinus ornus*, *Carpinus betulus*, *Acer platanoides*, individually also oaks (*Quercus petraea*, *Q. robur* and even *Q. cerris*) also growing on the sunny sides. Chestnuts (*Castanea sativa*) have been recorded as well, still growing around Tolmin.

What is missing for a more complete picture is an anthracological analysis of the remains from the settlement associated with the cemetery at Tolmin, which has not yet been unearthed. How much wood – and what species – was used in its construction? Is it possible that beech had already been depleted in this area at the beginning of the Iron Age (8th/7th century BC), which then led the Tolmin community to migrate and establish a new settlement at Most na Soči? These questions are raised by the fact that the entire body of archaeobotanical remains from the cremation graves at Tolmin, consisting of 238 charcoal specimens, included not a single specimen that would belong to *Fagus*. Neither are any of the coniferous species represented. The present-day canopy includes a fair amount of *Abies*, which began to be planted not so long ago and is successfully propagating, as Dakskobler observes.[2]

JEROVCA ON THE PLATEAU OF ŠENTVIŠKA PLANOTA

Slightly removed from the centre of the Posočje (Sveta Lucija) Iron Age community at Most na Soči, a flat cremation cemetery was investigated in 2007 at Jerovca on Šentviška planota. The rescue archaeological excavations revealed 22 graves dated from the end of the 6th to the 4th century BC (Laharnar, Mlinar 2011). The north-eastern part of this karst plateau, at an altitude of just under 800 m asl, offers favourable conditions for animal husbandry, crop cultivation and fruit growing (possibly primarily to iron ore prospectors).

Charcoal specimens were taken from 12 graves. The analysis examined 343 specimens, of which 325 showed anatomical features of *Fagus sylvatica*, several specimens belonged to *Carpinus* sp. and *Sorbus* sp., one to *Fraxinus* sp. and *Acer* sp., respectively (Culiberg 2011). The 95% share of beech charcoal suggests a predominance of more or less pure beech forest on the plateau hosting the new settlement.

Beech may have been largely cut down in the area to gain land for habitation or pasturing, possibly for fields or even due to presumed ironworking activities, but is today prevalent and forms forests in association with different tree species. The young beech growth is the most common on overgrowing pastures.

For the past, carpological finds also provide an interesting insight. Graves 6 and 18 contained two burnt halves of hazelnut shells (*Corylus avellana*), Grave 1 a slightly less burnt plum stone (*Prunus domestica*). The specimens included charred and uncharred bits of bone, which suggests the plant remains to be contemporaneous with the archaeological goods in the graves.

[1] Igor Dakskobler, associate at the Biološki inštitut Jovana Hadžija ZRC SAZU, has provided the list in written form.

[2] Igor Dakskobler kindly provided this information from his own records.

ČADRG – LAZE I

The archaeological investigations on a patch of grassland near the Čadrg village, which lies roughly 700 m asl above the left bank of the River Tolminka, revealed three pits. The pits contained archaeological remains from the Late Hallstatt and La Tène periods (Mlinar, Turk 2016, 20–21). Two of them are interpreted as burial pits (Graves 2 and 3), while Pit 1 revealed no cremated human bones. Charcoal was collected and analysed from all three.

Pit 1: 26 specimens of *Fagus sylvatica*, 17 of *Carpinus* sp., 2 of *Fraxinus* sp., 3 of *Tilia* sp., 1 of *Taxus baccata*.

Grave 2: 58 specimens of *Fagus sylvatica*, 20 of *Carpinus* sp., 7 of *Tilia* sp., 4 of *Alnus* sp., 1 of *Acer* sp., 1 of *Sorbus aucuparia /aria*; 6 of *Picea abies*, 4 of *Abies alba*, 1 of *Pinus* sp., 1 of *Juniperus communis*; several specimens could only be identified to the level of conifers.

Grave 3: 1800 ml of charcoal; 307 of the randomly selected specimens belong to *Fagus sylvatica* and 7 to *Carpinus* sp.

From Pit 1, we also analysed a specimen of weathered and sediment-impregnated wood from the socket of a spearhead. Its transverse section showed pores joined in radial groups and aggregated rays, which is characteristic of hornbeam, alder or hazel wood. A specimen of this wood was then soaked in a weak solution of hydrochloric acid to clean the carbonate impregnation as much as possible. A careful examination fairly clearly showed several vessels in tangential section, as well as no scalariform perforation plates characteristic of alder and hazel wood. The vessels revealed spiral thickenings at places, which is characteristic of *Carpinus* sp.

Less certain is the characterisation of the piece of wood from Grave 3, found in the butt of a spear. The piece was in parts impregnated with iron oxide; the structure of the wood was not visible in those parts. The transverse section revealed relatively rare, diffusely arranged individual pores. A careful examination of the tangential section showed possible remains of scalariform perforation plates with a large number of bars in one spot, which is typical of *Cornus* wood. The distribution of the pores in transverse section also allows for the wood to belong to *Acer* sp.

SRPENICA

A chance find of situla fragments at the Ograjenca site in 2003, in the vicinity of the village of Srpenica in the Soča Valley, led to the discovery of the first burial (Grave 1) at the site. The excavation of a water pipeline trench in 2008 brought to light further two (Grave 2 and Grave 3), located some 80 m away. The cemetery, dated roughly between the 6th and the 4th century BC, is among the most northern-lying sites of the Early Iron Age Posočje community (Mlinar 2009–2010). Only the charcoal from Graves 2 and 3 was analysed.

Grave 2: 31 of the 35 analysed specimens belong to *Fagus sylvatica* and 4 to *Abies alba*.

Grave 3: The charcoal of *Fagus sylvatica* prevails here as well, with 235 specimens; four specimens belong to *Ulmus* sp. and one to *Abies alba*, *Carpinus* sp. and *Taxus baccata*, respectively. The charcoal was mixed with cremated bone pieces.

JELENŠEK ABOVE GODOVIČ

The settlement farthest removed from the centre of the Posočje (Sveta Lucija) community at Most na Soči was located on the Jelenšek hill above Godovič. The associated cemetery was discovered by chance on the saddle below the hilltop, where rescue archaeological excavations were conducted in 1993 (Bratina 1994; 1997; Svoljšak 1997). The excavations unearthed 37 cremation burials with rich grave goods (weapons and tools in the graves of men and jewellery in the graves of women); the burials date to the 4th century BC. Alojz Šercelj and Metka Culiberg, from the Biološki inštitut Jovana Hadžija ZRC SAZU, analysed the charcoal from 17 of the graves. The results of the anthracological analysis are published here for the first time, on *Graph 6*. The analysis examined 359 specimens. Just under 70% of them belong to *Fagus sylvatica* and 9.7% to *Ulmus* sp., some specimens also belong to *Carpinus* sp., *Acer* sp. and *Picea* sp. Interestingly, *Taxus baccata* is represented with 7.8%; this coniferous species is dispersed across the territory of Slovenia and is relatively common in the north-western part of the Alpine region. It grows best in the belt of beech and mixed coniferous forests, also in the area of Godovič. Its wood is hard and flexible. People have been extensively exploiting yew wood as it is suitable for a variety of products, including hunting weapons such as lances and bows (Brus 2004, 102–103). At the Stare gmajne pile-dwelling site in the Ljubljansko barje, a child's bow of yew wood was found that is over 5000 years old (Tolar, Zupančič 2009, 241–242), while the riverbed of the Ljubljanica at Sinja Gorica yielded as much as 40,000 years old wooden projectile point of yew (Gaspari, Erič, Odar 2012). Products of yew or their fragments are also known from later archaeological sites, most commonly only as yew charcoal. It is likely that, at the time of the settlement at Jelenšek, yew was a more common member of the predominantly beech forest than today, it is hence possible that its wood was used for different parts of tools or weapons. When such artefacts were offered to the deceased at cremation, the wooden parts would have burned and left bits of charcoal behind.

CONCLUSIONS

The present-day vegetation is the result of natural processes, but in a large measure also of human activities in the recent and the more remote past. The pollen analysis of lacustrine sediments or forest soils records the changes in vegetation and allows an insight into the succession of individual types of forest communities, while it is less useful in establishing the vegetation in the immediate vicinity of a site, as the information it offers pertains to wider surroundings. On the other hand, the wood charcoal and other plant macroremains from archaeological sites, chronologically well defined, offer an insight into the vegetation in proximity to the site. It is thus very likely that most of the tree and shrub species established at archaeological sites grew in their vicinity, but it is not known to what extent. It should also be taken into account that only the more durable tree species were selected for construction purposes, such as oak, beech, spruce or others, while cremation or burnt offerings, as well as fuel required a wider variety of wood species. Having said that, analyses show that beech was the most common wood used even for the latter activities. This could have led to a certain wood species being depleted, during the life of a settlement that could have spanned through several centuries, to the degree that considerably altered the forest composition.

The pollen analysis of the numerous samples of lacustrine chalk taken along the Upper Posočje region has shown that they mostly belong to earlier sediments with prevailing cold-period vegetation with pine and birch. From the end of the Pleistocene and in the (opening) initial stages of the Holocene, forest vegetation still depended entirely on the climate; such vegetation was established in the samples from the 11-metre-high section of lacustrine chalk taken in the bank of the Soča at Srpenica. The radiocarbon analysis confirmed the vegetation of the late glacial, i.e. the period when climate gradually began warming up (Bavec et al. 2005; Šercelj 1996). The sample from the Zadnja Trenta valley, taken from the 1.5 m high section of lacustrine chalk next to a weathered spruce of larch trunk radiocarbon dated to around 7000 years before the present, revealed the pollen of pine, spruce and fir, as well as of deciduous vegetation typical of the Holocene: hazel, oak, lime, elm, maple and even beech (Šercelj, Culiberg).[3] In the sample of grey sandy carbonate clay from the area of Kobarid, Šercelj (1981, 135) was able to establish Holocene vegetation with spruce, fir and beech, which indicates a beech-fir community (Abieti-Fagetum). Without the information on vegetation successions, he believed this could have been either the primary beech-fir community that had reached its final stage of development already in the first half of the postglacial, or a renewal after the forest degradation caused by the dense population of the Tolmin area in the Bronze and even more so the Iron Age. It has as yet not been possible to find later sediments that would be suitable for pollen analysis and would allow us to trace the changes in vegetation through a longer period, particularly from the Bronze Age onwards.

Current evidence suggests that the central part of the Posočje region was covered with beech forest, though beech certainly suffered extensive clearing in different periods. The construction of a settlement necessitated great quantities of wood, the inhabitants of the settlement also gained fields and pastures by clear-cutting vast tracts of lands. The analysis of the charcoal recovered from the graves of most of the cemeteries in the region indicates that the funeral pyres were also most commonly constructed of beech wood. The only exception here is the cemetery at Tolmin, which revealed not a single specimen of beech wood. We can only speculate whether, in late prehistory, beech was largely depleted in the Tolmin area. This speculation could be illuminated by an anthracological analysis of the wooden remains from the Tolmin settlement, which must have existed but has not yet been discovered. The lack of wood for construction purposes may also have been one of the reasons that led the Tolmin community to move to Most na Soči around the 7th century BC. The analysis of the charcoal from the Iron Age settlement at Most na Soči has shown that oak, fir and pine wood was most commonly used in construction, while beech was much less common (Motella de Carlo 2018a, 361–402). It is possible that beech had already been heavily depleted in the Bronze Age, and the degraded or denudated soil overgrown by oak, a tree species that is again rather rare at present.

In contrast, the analysis of the charcoal from the Iron Age graves at Pucarjev rob and Repelc, both at Most na Soči, shows that beech was still present in the area and was used as the main fuelwood for the cremation of the dead. A slightly different picture is provided by the analysis of the charcoal from the eight Roman period graves at Repelc, only 'disturbed' by the charcoal contents from Grave R 4 that showed a predominance of ash, but also a fair amount of beech. Another cemetery was unearthed on the right bank of the Idrijca, i.e. Necropolis II beside the Roman settlement, dated between the 1st century BC and the 1st century AD. Sila Motella de Carlo analysed the charcoal from this cemetery, examining 427 specimens from 53 graves. The graph she published (Motella de Carlo 2018b, 227, Fig. 7) shows beech to be represented with more than 30%, followed by *Carpinus*, *Acer* and lower quantities of *Juglans* and *Fraxinus*, while other species including oak only occur sporadically. Most of the anthracological analyses performed for the Posočje region suggest that beech was present to different extents in all periods, from the Bronze Age to the Roman period, and

[3] Unpublished report, submitted to J. Kunaver.

that it quickly regained its ground even after extensive depletion.

The predominantly beech forests on the plateaus that hosted small settlements (such as Čadrg and Jerovca) established mainly in connection with iron ore prospection, as well as pasturing and forest exploitation, did not suffer such great damage.

The charcoal content from the graves shows a fairly uniform picture, but we should also mention a few particular features. At Pucarjev rob in Most na Soči, Grave PR 25 revealed four charcoal pieces with features characteristic of *Vitis* sp. Pips of grapevine are common finds in Neolithic, Iron Age and particularly Roman period sites, while the charcoal of its woody stems is much rarer. It is not likely that grapevine was cultivated in this area, as the recovered seeds and grains from the settlement at Most na Soči included no grapevine pips (Motella de Carlo 2018, 381). Grapevine is not a common plant here today, with the exception of the odd pergola next to houses. For this reason, the wood charcoal from Grave PR 25 might sooner belong to the wild variety (*Vitis vinifera* subsp. *sylvestris*), which grows as a climbing plant in mixed forests on gravelly soils. Today, this is a rare and protected species growing on only few known locations, some also in the valley of the Idrijca (Dakskobler 1995; 2008; Piltaver 2007).

Grave R 1 at Repelc, dating to the Roman period, yielded three pieces of charred walnut wood, while kernels (Motella de Carlo 2018a, 379) and fragments of shells (Tolar 2018, 449) were found in several houses of the Iron Age settlement on the opposite bank of the Idrijca. It is not clear when and how walnuts spread to Europe, we do know, however, of charred fruit remains from Europe that date already to the Late Iron Age. Walnuts certainly became widespread with the Romans, who greatly valued them (Zohary, Hopf 2004, 188–189). The trees now grow in Posočje and individually even spread into forests, as Dakskobler observes.[4]

It has already been mentioned that the several litres of selected charcoal pieces from the cremation pit at Repelc yielded no seeds with the exception of a few millet grains (*Panicum* sp.). Larger quantities, particularly of cereal grains and fragments of fruit, were collected in House 6 of the settlement at Most na Soči (Motella de Carlo 2018a, 379–383; Tolar 2018, 445–452).

One of the most intriguing and rare carpological finds in Slovenia has come to light in Grave 1 at Jerovca, on the plateau of Šentviška planota: a plum stone (*Prunus domestica*). In Europe, the known stones date back as early as the Neolithic and the Copper Age. Archaeobotanists offer different explanations regarding the origin of *Prunus domestica*. Some believe it was grown by crossbreeding different species of the Prunus family and brought to Europe during the Neolithic, while others think it is a species indigenous to central Europe where it is best suited to the continental climate (Zohary, Hopf 2004, 179–181, Woldring 1997–1998, 547). It would be possible that the Iron Age inhabitants at Jerovca, probably attracted by the deposits of iron ore, also grew fruit trees, while it is also feasible that they exchanged their produce with the inhabitants in the lowland. Two burnt halves of hazelnut shells (*Corylus avellana*) from this site also indicate animal husbandry, as hazel shrubs rank among the plants that rapidly inhabit pastures.

[4] According to the data from his personal records.

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