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Jantarni prsten iz rimske nekropole Burle kod Medulina u svjetlu korištenja jantara u antici

The Amber Ring From the Roman Necropolis of Burle near Medulin in the Context of the Use of Amber in Antiquity

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U uvodnom dijelu navode se fenomeni ambre u prirodi, trgovački pravci kretanja u antici, simbolika i zdravstvena svojstva skupocjene smole, te načini obrade, posebno u Akvileji. Jantarni prsten s prikazom životinje (lava) i mladolikog muškarca (Heraklo) iz rimske nekropole Burle u Medulinu (1.–2. st.), uz komparaciju s akvilejskim jantarnim nakitom, veličinom, bojom i značajem jedinstven je u ikonografskoj izražajnoj formi.

Gljučne riječi: jantar, jantarni prsten, lav, Heraklo, nekropola, Burle, Medulin

The introduction deals with amber as a natural phenomenon, antique trade routes, the symbolic and healing properties of the precious resin and the methods of its processing, in particular in Aquileia. When compared to Aquileian amber jewellery, by its size, colour and significance, the amber ring bearing the representation of an animal (lion) and a young man (Heracles) from the Roman necropolis of Burle in Medulin (1st – 2nd century), is iconographically unique.

Key words: amber, amber ring, lion, Heracles, necropolis, Burle, Medulin

Fenomen ambre u prirodi, a kasnije i njena uporabna vrijednost, poznati su već od starih mitoloških prapovijesnih vremena. Opći naziv *ambra* sadrži u sebi nekoliko vrsta fosilizirane biljne smole. Pojam se dosada koristio kao *ambra s Baltika* (Plin., Nat. Hist.: XXXVII, 45), međutim istraživanjima i zanimanjem za taj prirodni proizvod tijekom 19. stoljeća, koristeći ujedno novu tehnologiju, poznato je da se danas jantar razlikuje po vremenu nastanka, podrijetlu kao i fizičkim i kemijskim svojstvima (Palavestra, Krstić 2006: 10).

Današnja riječ *jantar* je rimskog podrijetla, preuzeta iz litvanskog i ugrofinskog govora (*gintares* ili *gyanta*). Latinski naziv bio je germanskog podrijetla (*glaesum* ili *sucunum*), kojeg upotrebljavaju Plinije Stariji (Plin., Nat. Hist.: XXXVII, 42) i Tacit (Tac., Germ.: 45, 4), a neki smatraju da je možda i ilirskog podrijetla (Bonfante 1985: 318; Palavestra, Krstić 2006: 20). Stari grčki naziv (elektron) bio je u upotrebi prije latinskog, kojeg također koriste u svojim zapisima Plinije Stariji i pjesnik Publije Ovidije Nason (Ovid., Metam.: II/159, 339–340). Riječ *ambra* prema Petru Skoku je cincarskog podrijetla i za njega “ambra je predmet trgovine” (Skok 1971: 358).

Kao što je rečeno, jantar je bio sadržaj brojnih mitova, koji kao uvijek imaju skriveni i slojevit sadržaj. Mitovi otkrivaju pored društvenih, socioloških, religijskih i običajnih

The natural phenomenon of amber and its subsequent utilitarian value have been known since ancient, mythological, pre-historical times. The generic term *amber* applies to several types of fossilized herbal resin. Although initially known as *Baltic amber* (Pliny., Nat. Hist.: XXXVII, 45), thanks to 19th century research and interest in this natural product and the use of new technologies, we now know that types of amber differ according to the time and place of origin and their physical and chemical properties (Palavestra, Krstić 2006: 10).

The present-day Croatian term *jantar* is of Roman origin, taken over from Lithuanian and the Finno-Ugric languages (*gintares* or *gyanta*). The Latin term, used by Pliny the Elder (Plin., Nat. Hist.: XXXVII, 42) and Tacitus (Tac., Germ.: 45, 4), was of Germanic origin (*glaesum* or *sucunum*), albeit some believe it to be of Illyrian origin (Bonfante 1985: 318; Palavestra, Krstić 2006: 20). The old Greek term (*electron*) was in use before the Latin one, also used by Pliny the Elder and the poet Publius Ovidius Naso (Ovid., Metam.: II/159, 339–340) in their writings. According to Petar Skok, the word *amber* is of Aromanian origin and, in his view, “amber is an article of commerce” (Skok 1971: 358).

As previously mentioned, amber was an element of various myths, the contents of which are always hidden and

sadržaja, onaj za nas vjerojatno najvažniji, a to su trgovački putovi i pravci kretanja ljudi i roba.

Pored grčkih i rimskih pisaca i znanstvenika, već Homer u *Odiseji* govori o *elektronima*. Poklon koji je dobila Penelopa od svojih prosaca bila je skupocjena jantarna ogrlica (Homer, *Odis.*: XV/460, XVIII/295–296).

Dvostruki su pravci kretanja jantara. Jedan sa sjevera ide preko Jutlanda, o kojoj govori grčki istraživač Pytheas iz 4. stoljeća pr. Kr. u djelu *O oceanu*. On smatra da je jantar sačuvana morska pjena i da se sa Jutlanda spušta rijekama Elbom i Rajnom. Zatim se njegov put račva rijekom Rhonom u pravcu Marseilla prema Mediteranu, a drugi vodi preko Alpa i Brennera do sjevernog Jadrana (Pauly-Wissowa 1899: III/298; Spekke 1957: 19–20; Budrys 2001: 263; Palavestra, Krstić 2006: 22).

Dvosmjernost podrijetla ambre očituje se i u tekstovima Pseudo-Aristotela kada piše o otočju Elektrida na ušću rijeke Eridan (Edidanos) u Jadranskom moru. Danas moderniji istraživači smještaju rijeku Eridan na područje Lemanskog jezera u koje je upao Phaeton, Helijev sin vozeći kola, a gdje se Eridan račvao u tri toka: jedan u pravcu Jadrana, drugi u Ligurski zaljev i treći u pravcu sjevera rijekama Po, Rhonom i Rajnom, koje su bile sastavnice rijeke Eridan (Katičić 1970: 105).

Pjesnik Publije Ovidije Nason je bazirao svoju verziju o ambri na priči o Phaetonu, smatrajući da su se suze njegove majke Climene pretvorile u ambru. Rijeka Eridan (Eridanos) prihvatila je ove suze i pronijela ih na sve destinacije, tako da su rimske udavače i mlade žene mogle nositi ogrlice od jantarskog zrnja (Ovid., *Metam.*: II/152–339, 340; Srejić, Cermanović 1979: 356, 428–429).

Pseudo-Aristotel je najvjerojatnije na znanstveni način utvrdio sastav jantara ističući da je to stvrdnuta smola, koja je tijekom vremena i stvrdnjavanja u sebi zarobila i mnoge insekte (Budrys 2001: 263). Još je jasniji bio Plinije Stariji u navedenom djelu *Naturalis Historiae*, gdje tretira jantar kao predmet luksuza bez neke posebne praktične primjene. On također tvrdi da je ambra dolazila sa sjevera iz Germanije (Plin., *Nat. Hist.*: XXXVII, 47), gdje su ju rimski vojnici nazivali *glaesaria*, te da je to sok (resin), koji je kapao s pinija. Plinije ujedno i spominje da su Germani donijeli jantar u Panoniju, odakle su ga Veneti prenijeli na područje sjevernog Jadrana i rijeku Po. Tu su u Galiji i Transpadaniji jantar koristile žene kao ukras na svojim nošnjama. Zaključno je Plinije vjerovao da su se jantarne ogrlice i nakit – amulete (*amuletum*) (Plin., *Nat. Hist.*: XXXVII, 3, 12) nosili u profilaktičke svrhe, štiteći one koje boluju od grlenih i vratnih bolesti (Plin., *Nat. Hist.*: XXV, 115). On se u svom “traktatu” o jantaru osvrće na trgovinu jantarom i ulogu koju je imao u rimskoj civilizaciji toga vremena. Govori o velikim količinama koje su uvažane sa sjevera, ali i o visokoj cijeni koja se plaćala u Rimu za “skamenjenu smolu” i kaže da je jedna mala izrađevina od jantara imala veću vrijednost od “nekoliko ljudskih stvorenja” (robova) (Plin., *Nat. Hist.*: XXXVII, 36; Fadić 1998: 159).

Činjenica je, da je jantar dolazio do Grka sa sjevernog Jadrana, otoka Elektrida, gdje se od prapovijesnih vremena spuštao sa sjevera dolinama rijeka do Jadrana trgovačkim putovima (Katičić 1970: 104; Katičić 1974: 36). Poznato je da

layered. In addition to information on societies, religion and customs, myths also provide information on trade routes and the movement of people and goods which, in this context, is probably the most important.

In addition to other Greek and Roman writers and scientists, *electrons* are already mentioned by Homer in his *Odyssey*: Penelope receives the gift of a precious amber necklace from her suitors (Homer, *Odis.*: XV/460, XVIII/295–296).

Amber travelled in two directions. One route came from the North, via Jutland, and is mentioned in the 4th century BC by the Greek explorer Pytheas in his work *On the Ocean*. He believed that amber was preserved sea foam, carried down from Jutland by the Elbe and the Rhine. It then forks off, in one direction along the River Rhône, towards Marseille and the Mediterranean and, in the other, via the Alps and the Brenner Pass to the North Adriatic (Pauly-Wissowa 1899: III/298; Spekke 1957: 19–20; Budrys 2001: 263; Palavestra, Krstić 2006: 22).

This dual origin of amber is reflected in the texts of Pseudo-Aristotle who wrote about Elektris, an island at the mouth of the River Eridanos in the Adriatic. Modern researchers place the River Eridanos in the area of Lake Lemano into which Phaeton, son of Helios, fell while driving a chariot. This is the point where the Eridanos splits into three rivers: one flowing towards the Adriatic, one towards the Ligurian Sea and one towards the North, along the Eridanos' tributaries the Po, the Rhône and the Rhine (Katičić 1970: 105).

The poet Publius Ovidius Naso based his theory of amber on the story of Phaeton; he believed that the tears of Phaeton's mother Clymene turned into amber. The River Eridanos received these tears and spread them to all destinations, making it possible for all girls of marrying age and all young women in Rome to wear amber necklaces (Ovid., *Metam.*: II/152–339, 340; Srejić, Cermanović 1979: 356, 428–429).

Pseudo-Aristotle most probably established the composition of amber in a scientific manner: he pointed out that this was solidified resin which, as it hardened, imprisoned many insects within (Budrys 2001: 263). Pliny the Elder was even clearer in his *Naturalis Historiae* in which he treats amber as a luxury item without any practical use. He also claims that amber came from Germania in the North (Plin., *Nat. Hist.*: XXXVII, 47), where Roman soldiers referred to it as *glaesaria*, and that it was juice (resin) dripping from stone pines. Pliny also mentions that Germanic tribes brought amber to Pannonia, from where the Venetians took it to the Northern Adriatic and the River Po. Here, in Gaul and Transpadane Gaul, women used amber to decorate their apparel. Pliny believed that amber necklaces and jewellery were worn as amulets (*amuletum*) (Plin., *Nat. Hist.*: XXXVII, 3, 12), for prophylactic purposes, protecting those suffering from throat or neck illnesses (Plin., *Nat. Hist.*: XXV, 115). In his “tractate” on amber, he mentions amber trade and the role it played in the Roman civilization at the time. He speaks of large quantities of “petrified resin” imported from the North and the high prices it commanded in Rome; according to him, a small item made of amber was more valuable than

je u prapovijesti istočna jadranska obala imala važno mjesto u trgovini jantantom, jer su jantarne izrađevine otkrivene u Istri (Bačić 1960: 197–199; Mihovilić 1986: 48; Buršić Matijašić 1988/1989: 475–494), Hrvatskom primorju (Glogović 1989: 46, 123) sjevernoj i srednjoj Dalmaciji (Batović 1981: 7–31, 89–150) i na području Like (Drechsler Bižić 1970: 6–7; Drechsler Bižić 1979/1980: 27–28; Fadić 1998: 160).

Rimska ambra iz Akvileje, analizirana infracrvenim zrakama je vjerojatno baltičkog podrijetla (Calvi 2005: 10), a odnosi se na primjerke obrađivane u 1. i 2. stoljeću poslije Krista, za razliku od one prapovijesne s kraja drugog na prvo tisućljeće i 600. godina pr. Krista iz Padove i Este.

Veliki utjecaj ambre u trgovačkom smislu dogodio se nakon što je Tiberije premjestio limes na Dunav i uspostavio političke i trgovačke odnose s narodima koji su živjeli na području između Baltika i Dunava. O odnosima s Germanima, trgovini u to doba, prelaskom limesa i dobrim odnosima s njihovim kraljem piše Tacit (Tac., Germ.: II/62, 3), te da su neki rimski trgovci dobili i *ius commercii*, koji je bio temeljen vjerojatno na reciprocitetu. Posebno se spominje kod Plinija (Plin., Nat. Hist.: XXXVII, 45) *equus romanus* iz Neronovog doba, koji su stigli sve do Baltika (Kolendo 1981). U flavijevsko-trajanovo vrijeme 2. stoljeća ove su *stationes* još više ojačale, o čemu govore i otkrića iz Brigetia datirana u doba Antonina. Trgovački odnosi bili su sigurni sve do kraja 3. stoljeća, kada su upadi Barbara u 4. stoljeću, posebno Sarmata iz Panonije otežali i ugrozili trgovačke putove, pa tako i trgovinu s jantantom (Gabler 1983: 88–117).

Akvilejski trgovci su trgujući s Panonijom preko Emonae, Celeiae – Scarabantiae – Carnuntuma dolazili do dragocjenog jantara, kojeg su obrađivali i prodavali na širem sjevernojadranskom području (Maselli 1996: 125–129). Najpoznatiji trgovci toga doba s jantantom bili su iz obitelji Barbija (Barbii), poznati u Trstu i sjevernoj Istri (Šašel 1966: 134–137; Calvi 2005: 13–14). Trgovina je bila dvosmjerno usmjerena s proizvodima tipičnim za područje Akvileje i Desete italske regije *Venetia et Histria*, u koju je spadao i istarski poluotok na granici s rijekom Rašom (*Arsia fl.*). Trgovalo se uljem, vinom, keramičkim i staklenim izrađevinama, metalnim proizvodima (Calvi 1980: 464–465; Kunow 1985: 229–279; Soproni 1990: 349–354). Histrija kao i Dalmacija bile su daljnji distributeri gospodarskih proizvoda, pa tako i ambre koja je dolazila sa sjevera u zamjenu za domaće proizvode što dokazuju i novija arheološka istraživanja i otkrića (Uggeri 1985: 165).

Obrada jantara bila je u principu veoma osjetljiva i skupa, te su je mogli izvoditi samo specijalizirano izučeni majstori u posebnim obrtničkim radionicama. O postupku obrade grubog grumenja stvrdnute smole može se nagađati koristeći brojne komparativne metode radioničkih i majstorskih postupaka, ali nisu poznati autori sjajnih izrađevina od jantara. To su bili u pravilu umjetnički predmeti, posebno dragocjeni i luksuzni, koje su u pravilu zbog skupoće materijala i obrade naručivali bogati vlasnici imanja senatorskih i carskih obitelji. Radilo se, kako kažu Plinije (Plin., Nat. Hist.: XXXVII, 45) i Tacit (Tac., Germ., 41) o posebnoj klijenteli, spremnoj da investira veliko bogatstvo plaćajući pristojbe na robu i zasigurno su bili pripadnici akvilejske ili histarske “buržoazije”

“several human beings” (slaves) (Plin., Nat. Hist.: XXXVII, 36; Fadić 1998: 159).

It is a fact that amber reached the Greeks from the island of Elektris in the North Adriatic; ever since prehistoric times it had been travelling down from the North, following the trade routes along the river valleys towards the Adriatic (Katičić 1970: 104; Katičić 1974: 36). We know that the Eastern Adriatic coast played an important role in prehistoric amber trade because amber items were discovered in Istria (Bačić 1960: 197–199; Mihovilić 1986: 48; Buršić Matijašić 1988/1989: 475–494), the Croatian Primorje (Glogović 1989: 46, 123) Northern and Central Dalmatia (Batović 1981: 7–31, 89–150) and the territory of Lika (Drechsler Bižić 1970: 6–7; Drechsler Bižić 1979/1980: 27–28; Fadić 1998: 160).

The Roman amber from Aquileia, analysed by infra-red spectroscopy, is probably of Baltic provenance (Calvi 2005: 10) and includes items crafted in the 1st and 2nd centuries AD, unlike the prehistoric amber from Padua and Este, which dates back to the turn of the 2nd and 1st millennia and approximately 600 years BC.

Amber became a highly important commodity once Tiberius moved the limes to the River Danube and established political and trade relations with the peoples living between the Baltic and the Danube. Tacitus writes about the relations with German tribes, the trade conducted across the limes, good relations with their king (Tac., Germ.: II/62, 3), and the fact that certain Roman tradesmen were granted *ius commercii*, probably based on reciprocity. In particular, Pliny mentions (Plin., Nat. Hist.: XXXVII, 45) the *equus romanus* from Nero's times who came all the way to the Baltic (Kolendo 1981). In the Flavian/Trajan 2nd century, these *stationes* became even more powerful, which is testified to by the discoveries from Brigetio dating back to the times of Antoninus. Trade relations remained secure until the end of the 3rd century. In the 4th century, barbarian incursions, especially those by the Sarmatians from Pannonia, made trade routes dangerous, hampering all trade, including that of amber (Gabler 1983: 88–117).

Aquileian tradesmen acquired precious amber from Pannonia via Emona, Celeia, Scarabantia and Carnuntum, crafted it and sold it on the North Adriatic territory (Maselli 1996: 125–129). The most famous amber traders of the time came from the Barbii family, known in Trieste and Northern Istria (Šašel 1966: 134–137; Calvi 2005: 13–14). Trade was, however, reciprocal, involving products typical of Aquileia and the 10th Region of Roman Italy entitled *Venetia et Histria*, which included the Istrian peninsula bordering with the river Raša (*Arsia fl.*). Traded goods included oil, wine, ceramic and glass crafts and metal products (Calvi 1980: 464–465; Kunow 1985: 229–279; Soproni 1990: 349–354). Histria, like Dalmatia, was a secondary dealer of commercial products, including amber, which came from the North and was exchanged for local products, as proven by recent archaeological excavations and discoveries (Uggeri 1985: 165).

As crafting of amber was, as a rule, very delicate and expensive, it could only be done by specially trained craftsmen in special workshops. We can only speculate about the procedures used for the processing of coarse nodules of

(Calvi 1984: 29–30).

Prema C. M. Calvi postoje dobri razlozi da se jantar obrađivao i u radionicama za izradu gema (Calvi 2005: 16), jer su nađeni ostaci jantara zajedno u akvilejskom sektoru *insulae orientalis II* s brojnim primjercima sa staklenom pastom i drugim dekorativnim poluproizvodima i vrijednim dijelovima nakita (Calvi 1996: 13–20). Jednako tako otkriven je jantarni nakit zajedno s gemama u Herkulanu, te se pretpostavlja da su ih izrađivali isti "skulptori" (*sculptores*) (Maiuri 1958; 463).

Često se nalaze analogije u repertoaru kao i stilu predmeta od jantara i poludragog kamenja, gdje se vjerojatno nalaze i modeli za izradu predmeta od jantara žućkaste boje, koja se mijenja pod utjecajem topline, što ovisi o biljci od koje je jantarna skrućena smola potjecala (Calvi 2005: 16).

O tehnici obrade ovog krhkog dragocjenog materijala govorili su Teofrast (Teofr., Peri lit.: I, 5 i VII, 41) i Plinije (Plin., Nat. Hist.: XXXVII, 76) naglašavajući upotrebu željeznih instrumenata kojima se obrađivalo dragocjeno kamenje i o kojima se mogu rekonstruirati povijesne osnove rada, posebno u obradi slonove kosti i ambre. U pojedinom oruđu otkrivenom u Akvileji za obradu navedenih sirovina može se prepoznati i ono za obradu ambre: tanka špica (*punta sottile*) za tanku inciziju; špic sa tri oštrice; trokutasti špic u obliku lista za izradu širokih otvora, posebno prstenja. Sve ovo oruđe koristilo se uz podmazivanje uljem i vodom da se prilikom bušenja i obrade ne bi jantar zagrijao i izgubio boju i kvalitetu (Calvi 2005: 18, 19). Završne operacije obrade sastojale su se u glačanju vunenom tkaninom omotanom oko kamene jezgre ili oko jednog špica za otvore. Posebno je za fino graviranje, prema Pliniju bila korištena silicijska prašina (*polvere di Nasso*) (Plin., Nat. Hist., XXXVII, 54). Postoje tragovi i pozlate na nekim otkrivenim predmetima, koji su na taj način postajali još vrijedniji (Calvi 2005: 19).

Akvileja kao glavni politički i trgovački grad Desete italske regije *Venetia et Histria* svakako je snabdijevala luksuznim predmetima ager kolonije Pole (*Colonia Iulia Pola Polentia Herculanea*), te tako i patricije, njihove članove uže i šire senatorske i carske obitelji, te stanovnike rezidencijskih maritimnih vila zapadne i južne istarske obale.

Nekropola maritimnog rezidencijeskog kompleksa na Vižuli kod Medulina, koja je u prvoj fazi izgrađena u doba formiranja kolonije Pole u prvoj polovini 1. stoljeća pr. Krista, dala je velik broj rimskih luksuznih predmeta u žarnim i skeletnim ukopima. Pored već poznatog zlatnog, srebrnog i brončanog nakita od kojeg su najpoznatiji zlatna ogrlica sa smaragdima, te smaragdne i ametistne naušnice, brojne ogrlice od staklenih perli i gagata (Džin 2000: 8–24; Girardi Jurkić 2002: 29–31; Džin 2004: 33–50; Džin 2009: 363–372), otkriven je na nekropoli dosada jedinstven rimski jantarni prsten, boje meda.

Prostrana nekropola bila je smještena na području prometnica koje su vodile prema Medulinu iz pravca Pule preko Šikića, Šišana (*Sissianum*) i Azzana (*Atianum*). Položajem je s istočne strane zapremala cijelu udolinu prema uzdignutim antičkim maritimnim rezidencijskim i gospodarskim građevinama i kasnoantičkom naselju na poluotoku Vižula. Jednim dijelom potonula je u medulinski zaljev i luku, dru-

solidified resin, comparing the numerous methods used by workshops and master craftsmen, but the creators of those exquisite amber items remain unknown. They were objects of art, exceptionally valuable and extremely luxurious because of the high cost of both material and processing; as such, they were, as a rule, ordered by rich property owners from senatorial and imperial families. In the words of Pliny (Plin., Nat. Hist.: XXXVII, 45) and Tacitus (Tac., Germ., 41), this was an exclusive clientele, prepared to spend large sums of money on these goods, and must have belonged to the Aquileian or Histrian "bourgeoisie" (Calvi 1984: 29–30).

According to C. M. Calvi, there were good reasons for processing amber in gem workshops (Calvi 2005: 16); in the Aquileian sector of *Insulae Orientalis II*, remains of amber were found alongside numerous samples of glass paste and other decorative semi-finished products and parts of valuable jewellery (Calvi 1996: 13–20). Since amber jewellery was also found alongside gems in Herculaneum, it was presumed to have been crafted by the same "sculptors" (*sculptores*) (Maiuri 1958; 463).

Frequent analogies can be found in the repertory and style of items made of amber and semi-precious stones. This probably included models used for the crafting of items from pale-yellow amber which, when exposed to heat, changes colour depending on the plant of its origin (Calvi 2005: 16)

The processing techniques used for this fragile precious material were discussed by both Theophrastus (Teofr., Peri lit.: I, 5 and VII, 41) and Pliny (Plin., Nat. Hist.: XXXVII, 76), who stressed the use of iron instruments otherwise used for the processing of precious stones; based on this, principles of processing can be reconstructed, in particular for ivory and amber. Among the tools found in Aquileia for the processing of these materials we can recognise those used for processing amber: thin awl (*punta sottile*) for fine incisions; a three-pronged tool; a leaf-shaped triangular awl for making wide holes, rings in particular. All these tools were lubricated with oil and water to prevent the amber from heating up during the drilling and processing and losing its colour and quality (Calvi 2005: 18, 19). Final processing involved polishing with a woollen cloth wrapped around a stone or an awl. According to Pliny, silicon powder (*polvere di Nasso*) was used in special cases, for fine engraving (Plin., Nat. Hist., XXXVII, 54). Some of the items found display traces of gilding which made them even more valuable (Calvi 2005: 19).

As the main political and commercial centre of the *Venetia et Histria* region, Aquileia provided luxury items for the ager of the colony of Pola (*Colonia Iulia Pola Pollentia Herculanea*), its estates, patricians, immediate and extended members of senatorial and imperial families and people inhabiting the residential maritime villas along the western and southern Istrian coast.

Many Roman luxurious items were found in the urn burials and inhumation graves of the necropolis of the maritime residential complex at Vižula near Medulin, the first phase of which was constructed in the first half of the 1st century BC, at the time when the colony of Pola was being established. Among the familiar gold, silver and bronze

gim dijelom u morski zaljev Burle, a na kopnu je ostao dio koji zaprema prevlaku poluotoka i dio kopna uz more na poluotoku i priobalju.

Otkrićem nadgrobne stele Eliodoru (*Aeliodoros*), datirane u kraj 2. ili početak 3. stoljeća (Girardi Jurkić 1980: 114–115), započela su arheološka iskapanja i istraživanja nekropole (Jurkić Girardi 1987: 167–188), koja su se izvodila u tri etape (1979./81., 1997.–1998., 1999./2000.). Tijekom prve etape sistematskog istraživanja otkriveno je 40 kosturnih grobova. Druge dvije etape zaštitnog arheološkog iskapanja omogućile su dokumentiranje 272 žarna i skeletna ukopa, a otkrivena su i dva olovna sarkofaga u zidanim grobnicama. Najraznovrsniji su paljevinski ukopi koji su se nalazili u škrapama bez recipijenata. Oni govore o ukopu romaniziranog siromašnijeg sloja autohtonog stanovništva. Dio ukopa se obavljao polaganjem spaljenih ostataka pokojnika u keramičkim žarama grube domaće proizvodnje u grobne jame iskopane u zemlji ili u prirodne udubine žive stijene. Dva paljevinska groba bila su u zidanim grobnicama, a jedan je grob bio tipa "a capana". Na novom dijelu nekropole nije otkrivena niti jedna staklena ola ili bilo koji njezin stakleni dio, iako je iskopano 20 žarnih grobova u kojima su stakleni i drugi grobni inventar bili razmjerno bogati. Među inventarom se ističe: pet staklenih lakrimarija i minuciozno izrađena čaša u formi kupe od tankog zelenkastog stakla s istakama i ručicama, dva metalna posrebrana zrcala, jedinstven primjerak velikog jantarnog prstena s prikazom životinje (lava) i božanskog lika (Heraklo) i lampica tipa Fortis. Evidentirani žarni ukopi činili su 10% od ukupno otkrivenih grobova nekropole.

U istraživačkoj kampanji 1997./1998. godine otkriven je jantarni prsten od smole boje meda (sl. 1), u spaljenoj amorfnoj grudi zemlje u paljevinskom grobu s lampicom tipa Fortis direktno u grobnoj jami a ne u recipijentu. Na grobnom mjestu u udubni otkriveni su uz njega samo malobrojni ostaci spaljenih kostiju u grumenima spaljenog stakla kao dio bustuma. Obzirom na veliku vrijednost prstena, ostaje otvoreno pitanje da li je naknadno položen u grobnu jamu tijekom pogrebne svečanosti i je li osobno pripadao pokojniku ili nekom njegovom članu obitelji ili štovatelju (Girardi Jurkić, Džin 2003: 63–75; Džin 2003: 133, kat.br. 147),

Otkriveni jantarni prsten (sl. 2) s prikazom divlje životinje lava, toljage i mitskog lika Herakla iz nekropole Burle je širine 4,4 cm, debljine 0,9 cm (inv.br. A 30008). Unutarnji otvor je gladak i poliran, dok je vanjski rub s reljefnim likovima grub i oblikovan u poligonalnoj formi. Pripada većem tipu takve vrste prstenja s kraja 1. na početak 2. stoljeća. Danas je neizložen u Arheološkom muzeju Istre u Puli (Džin 2007: 291, kat.br. 321)¹.

Tipologija prstenja, koja je do sada poznata i koju koriste prilikom obrade C. M. Calvi za Akvileju (Calvi 2005: 27–28) korištena je i razrađena prema poznatoj tipologiji iz Budimpešte (Henkel 1913; Sprincz 1957: 110–117; Giraud

jewellery discovered at the necropolis, the most famous being a golden necklace with emeralds, emerald and amethyst earrings and numerous necklaces made of glass and jet beads (Džin 2000: 8–24; Girardi Jurkić 2002: 29–31; Džin 2004: 33–50; Džin 2009: 363–372), there was a unique honey-coloured Roman amber ring.

The expansive necropolis was located along the roads leading from Pula to Medulin via Šikić, Šišan (*Sissianum*) and Azzano (*Atianum*). On its eastern side, it spread across the entire valley leading towards the elevated antique maritime residential and commercial buildings and the Late Antique settlement on the Vižula peninsula. One part has sunk into the Medulin Bay and port and another into the Burle cove, while the remaining dry-land area covers the isthmus and part of the coast along the peninsula and the surrounding littoral.

The discovery of Aeliodoros' grave stela, dating to the end of the 2nd or the beginning of the 3rd century (Girardi Jurkić 1980: 114–115) marked the beginning of archaeological excavations at the necropolis (Girardi Jurkić 1987: 167–188). The excavations were conducted in three phases (1979/81, 1997/1998, 1999/2000). The first phase of systematic excavations revealed 40 inhumation graves. The other two phases of rescue excavations documented 272 urn burials and inhumation graves. Two lead sarcophagi were also discovered in walled graves. Cremation graves, located in limestone cracks without any recipients, were very diverse. They tell us about the burials of the poor, Romanised, indigenous population. Some burials were conducted by laying coarse, locally-crafted, ceramic urns containing the incinerated remains of the deceased, into graves dug in the ground or natural hollows in solid rock. Two cremation graves were found in walled graves, and one grave was of the "a capanna" type. Even though 20 urn burials were dug out, revealing a relatively rich inventory of glass items and other grave goods, no glass olla, or any of its parts, were found in the new part of the necropolis. The following can be singled out among the inventory: five glass balsamaria and a minutely detailed glass in the shape of a cup, made of greenish glass with protrusions and handles, two metal silver-plated mirrors, a unique large amber ring with the representation of an animal (lion) and a deity (Heracles), and a Fortis lamp. The recorded urn burials constituted 10% of all graves discovered in the necropolis.

The 1997/1998 excavation campaign discovered an amber ring, made of honey-coloured resin (fig. 1), in an amorphous lump of burned soil in a cremation grave containing a Fortis lamp; it was located directly in the grave, not in a recipient. Only few remains of burned bones in lumps of burned glass were found alongside the ring in a hollow of the grave, as part of the bustum. Taking into account the high value of the ring, the question remains whether it was placed in the grave subsequently, during the funeral ceremony, and whether it belonged to the deceased, a member of his family or an admirer (Girardi Jurkić, Džin 2003: 63–75; Džin 2003: 133, cat. no. 147).

The amber ring (fig. 2) bearing a representation of a wild animal, i.e. a lion, a club and the mythical figure of Heracles,

¹ Prsten je bio otkriven u savršeno sačuvanom obliku, oštih i prepoznatljivih kontura likova: Heraklo, lav, toljaga. Tijekom neodgovornog tretmana i konzervacije u laboratoriju Arheološkog muzeja Istre Paraloidom B 72 u topivom sredstvu, prsten se degradirao u formi. Vršeni su naknadno pokušaji mehaničkog čišćenja i zaštite. Vidi: Gobić Bravar 2009: 125.



Sl. 1
Fig. 1

1989: 173–211; Gagetti 2000: 193–250; Gagetti 2001: 191–481).

Prilikom razmatranja različitih dekoracija rimskog prstenja od jantara 1. i 2. stoljeća, potrebno se koncentrirati na one koje su na vrhu obrade ukrašene ležećim lavom, psićima i dječjim likovima, većinom Erota i ljudske glave. Tip psića s glavom među šapama (po Calvi pripada grupi F) kao i onih s podignutom glavom su veoma česti ukrasi na prstenju u Akvileji (Calvi 2005: 28), ali su poznati i u muzejskim zbirkama rimske umjetnosti u svijetu. Smatrali su se čuvarima grobova (Calvi 2005: 30). Motivi s psićima bili su posebno popularni kod rimskih žena, koje su psiće imale kao kućne ljubimce. Ležeće pse nalazi se i na jantarnom prstenju u Saloni (Mardešić 2002; 183–184) i u Ninu (*Aenona*) (Fadić 1995: 80, kat. br. 2).

Motiv lava, posebno onoga koji proždire plijen, otkriva se često u funeralnom ciklusu priloga u širem antičkom svijetu, također i u hebrejsko-kršćanskoj ikonografiji kao simbolom moći koji proždire smrt. U Akvileji i Puli lav je postavljan kao kruna na funeralnim cipusima i mauzolejima (Calvi 2005: 30). Sličan motiv kao poredba nađen je u Akvileji na gemi od karniola. Prstenje je bilo također ukrašavano i Erotima, koji pripadaju grupi H (Calvi 2005: 28) odnosno podgrupi H¹, kako su nazvani po ukrasima Erota s nekim atributom.

Osim u Akvileji, motiv lava na gemama otkriven je u većem broju i u Saloni, gdje mu se pridaje astralni i solarni značaj u magiji (Delatte, Derchain 1964: 221; Worftmann 1966: 80–82).

Ova šira analiza dijela tipologije prstenja od jantara potrebna je zbog određivanja specifičnosti jantarnog prstena iz nekropole Burle, koji pripada velikom poligonalnom tipu prstena s lavom na gornjoj strani i jednom bočno uspravljenom muškom mladolikom figurom Herakla, koja je izraženija u muskulaturi i nagosti tijela sa stražnje stra-

discovered in the necropolis of Burle, is 4.4 cm wide and 0.9 cm thick (inv. no. A 30008). The inside opening is smooth and polished, while the external edge containing the figures in relief is rough and formed in a polygonal shape. It belongs to a larger group of similar rings from the end of the 1st and the beginning of the 2nd century. Today, it is kept in the Archaeological Museum of Istria in Pula, but not on display (Džin 2007: 291, cat. no. 321)¹.

The current ring typology used by C. M. Calvi in the processing of the Aquileian findings (Calvi 2005: 27–28) has been developed from the Budapest typology (Henkel 1913; Sprincz 1957: 110–117; Giraud 1989: 173–211; Gagetti 2000: 193–250; Gagetti 2001: 191–481).

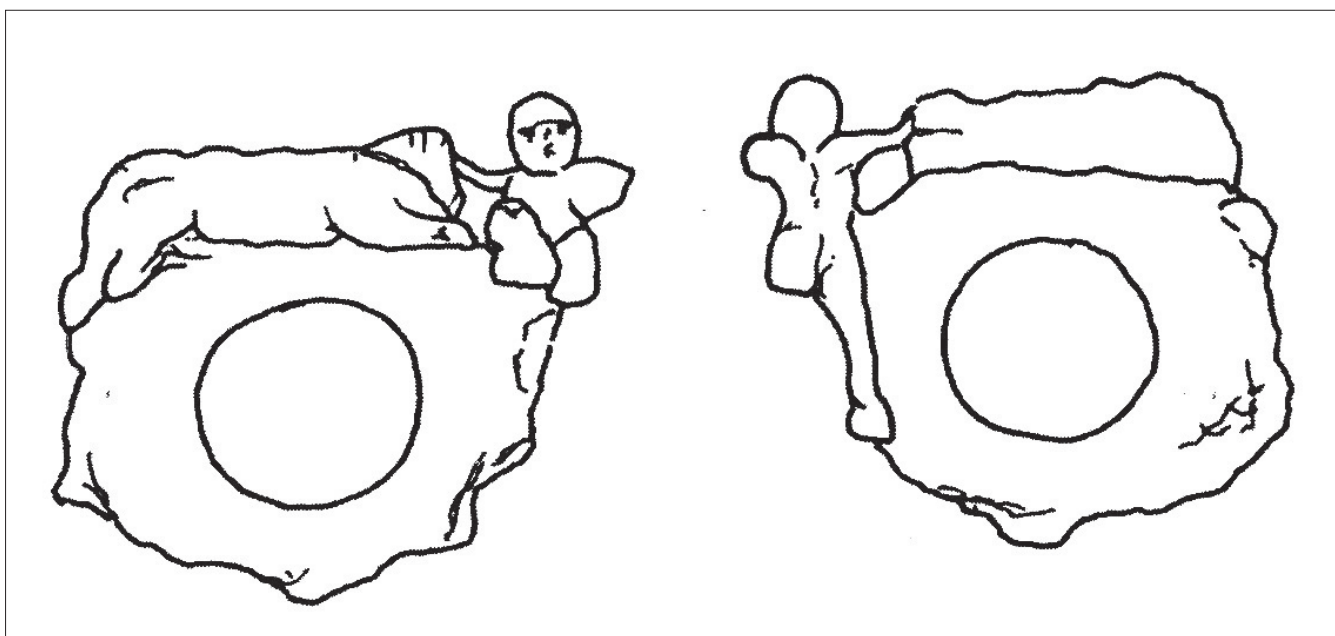
When examining the various decorations of Roman amber rings from the 1st and 2nd centuries, we must concentrate on the most skilfully crafted ones, decorated with reclining lions, puppies and figures of children, mostly erotes and human heads. Figures of puppies with heads in their paws (according to Calvi they belong to group F) as well as those with raised heads frequently adorned Aquileian rings (Calvi 2005: 28) and are well known in the Roman art collections of museums around the world. They were considered to be guardians of graves (Calvi 2005: 30). The puppy motif was particularly popular with Roman women who kept puppies as pets. Reclining dogs can also be found on amber rings from Salona (Mardešić 2002; 183–184) and Nin (*Aenona*) (Fadić 1995: 80, cat. no. 2).

The motif of a lion, in particular one devouring its prey, is frequently found among funeral-related grave goods of the Antique world in general, as well as in Hebrew and Christian iconography, where it appears as a symbol of death-devouring power. In Aquileia and Pula, lions were placed as crowns on cippuses and mausolea (Calvi 2005: 30). A comparably similar motif was found on a gem made of carnelian in Aquileia. There were also rings decorated with erotes, and those belong to group H (Calvi 2005: 28) or, rather, subgroup H¹, when decorated with one of the erotes and an attribute.

In addition to Aquileia, many lion-decorated gems were also discovered in Salona, where they were believed to possess astral and solar magical powers (Delatte, Derchain 1964: 221; Worftmann 1966: 80–82).

Such an extensive analysis of amber ring typology was necessary to determine the specific characteristics of the amber ring found in the Burle necropolis, it belongs to the large polygonal type of rings with a lion on the upper side and an upright figure of a young male, Heracles, standing sideways, whose muscles and nudity are more defined on the posterior. There are no traces of wings and there is a relief of a club, the symbol of Heracles, between the lion and the figure. These iconographic elements make it difficult to conclusively classify the Burle amber ring into any typology, subgroup or category. Its iconographic concept and form

¹ The ring was discovered in a state of perfect preservation, with the outlines of the figures - Heracles, lion and club - sharp and clearly distinguishable. Due to the careless application of Paraloid B72 in a solvent during the conservation conducted at the laboratory of the Archaeological Museum of Istria, the form of the ring degraded. Subsequent mechanical cleaning and protection was attempted. See: Gobić Bravar 2009: 125.



Sl. 2
Fig. 2

ne obrade lika. Nema tragova krila, a između lava i lika je reljefna toljaga – simbol Herakla. Zbog ovih navedenih ikonografskih elemenata, jantarni prsten iz nekropole Burle kod Medulina teško je decidirano svrstati u bilo koju od navedenih tipologija, podgrupa i kategorija. On je stoga zasada jedinstven u svojoj ikonografsko-koncipiranoj i izrađenoj formi. Kult Herakla je rjeđe prikazivan u jantarnoj gliptici. Indirektno ga nalazimo u Herkulanumu kao jantarni privjesak u obliku toljage u suburbanim termama. Herkulanum je staro mjesto štovanja Heraklovog kulta (Scatozza Höricht 1989: 83, br. 182).

Rimljani su prema Ovidiju smatrali čašću nositi na vlastitom prstu prsten ili pečatnjak s likom pretka ili zaštitnika, kao i dragog prijatelja. Ovidije (Ovid., *Tristia*: I, 7, 6 i d.) i Ciceron (Cicero, *De finibus*: V,1,3) često navode običaj da osobe koji su klijenti i sljedbenici važnijih osoba, nose prstenje kao znak političke promidžbe (Calvi 2005: 32). Tako se često nosilo prstenje s likovima carica (Mesalina, Agripina), a manje careva, rjeđe bogova, a najviše s likovima Psiha i Venere (Fadić 1998: 161), koje je češće nalaženo u Liburniji, a nema ga u Istri.

Analizirajući jantarni prsten iz nekropole Burle može se postaviti hipoteza da se radi o jantarnom prstenu s prikazom lava i Herakla, patrona grada Pule, kojem ageru je pripadalo i medulinsko područje. Možda je nošenje prstena s likom Herakla, osim funeralnog značaja imao i značaj političke propagande pokojnika i njegovih sljedbenika (Richter 1971: 4). Vjerojatno je Heraklo imao funkciju zaštitnika obitelji pokojnika, koji je nosio prsten ili mu je po smrti položen u grobnu jamu kao simbol trajne vjernosti koji pokojnik nudi bogovima pakla (Ritter 1889: 154). Jantarni prsten mogao je imati i profilaktičke ili terapijske značajke kao amulet, tj. zaštitnik vlasnika prstena od bolesti vrata u grla (Plin., *Nat. Hist.*: XXXIII, 6, 24).

Kao zaključak, može se pretpostaviti za sada, s obzirom

are, therefore, for the time being, unique. The cult of Heracles was rarely the subject of amber glyptography. We can find it, indirectly, in the suburban *thermae* of *Herculaneum*, in the form of a club-shaped amber pendant. *Herculaneum* was an ancient centre for worshipping the cult of Heracles (Scatozza Höricht 1989: 83, no. 182).

According to Ovid, the Romans considered it an honour to wear on their finger a ring, or a signet ring, bearing the figure of a predecessor, protector or dear friend. Ovid (Ovid., *Tristia*: I, 7, 6 and d.) and Cicero (Cicero, *De finibus*: V,1,3) frequently mention the custom of clients or followers of important persons wearing rings as a sign of political promotion (Calvi 2005: 32). Rings bearing figures of empresses (Messalina, Agrippina) were thus worn very frequently, kings less frequently and gods the least frequently, while those bearing figures of Psyche and Venus were worn the most frequently (Fadić 1998: 161) and often found in Liburnia but never in Istria.

Having analysed the amber ring from the Burle necropolis, we could put forward a hypothesis that this amber ring bears a representation of a lion and Heracles, the patron of the city of Pula, with the area of Medulin as part of its *ager*. Apart from funeral connotations, the ring bearing the figure of Heracles might have been a sign of political propaganda on the part of the deceased and his followers (Richter 1971: 4). Heracles was probably meant to protect the family of the deceased who either wore the ring or had it placed into the grave after death, as a symbol of everlasting loyalty offered to the gods of hell (Ritter 1889: 154). Amber rings may have had prophylactic or therapeutic properties, as an amulet, i.e. they protected the owner of the ring from neck and throat illnesses (Plin., *Nat. Hist.*: XXXIII, 6, 24).

In conclusion, taking into account the extent of research conducted in the Istrian necropolises to date, we may presume that, apart from *Aquileia*, the great producer of

na stupanj istraženosti istarskih nekropola, da pored Akvileje, velikog proizvođača jantarnog nakita, bogati rimski istarski poluotok s carskim i patricijskim posjedima zasigurno, osim jedinstvenog nalaza jantarnog prstena sa zanimljivom simbolikom Herakla, skriva i mnoge druge rimske jantarne nalaze. Putovi jantarnog nakita već od prapovijesti do u rimsko doba preko Istre nastavljali su se u Liburniju i dalje uzduž jadranske obale (Fadić 1998: 165, bilj. 10) s pretežito akvilejskim jantarnim repertoarom, uz neke specifičnosti vezane za viši socijalni i ekonomski status njihovih vlasnika. Treba ipak naglasiti da u Akvileji nije otkriven sličan prsten. Svijesni postojanja radionica u Herkulanu kao i povezanosti Pule s Herkulanom posredstvom Lucija Kalpurnija Pizona (*L. Calpurnius Piso Caesonius*), jednog od utemeljitelja rimske kolonije Pule uz Lucija Kasija Longina (*L. Cassius Longinus*) (Marion, Tassaux 2009: 45–46), koji je imao velike posjede i živio u Herkulanu, može se pretpostaviti da je na pulski kolonijски ager i na medulinsko područje jantarni prsten stigao ili posredstvom pokojnika iz Herkulana ili jednostavno kao predmet trgovine iz južnih kampanijskih radionica.

Činjenica je da među brojnim, do danas otkrivenim i obrađenim nalazima akvilejskog jantarnog nakita, nema takvog identičnog prsten, iako se raspolaže sa sličnim motivima (psić, lav, Eroti). Pula, kao glavni grad pulskog agera pod zaštitom Herakla, kojem je u 1. i 2. stoljeću pripadao i maritimni rezidencijski kompleks na Vižuli u Medulinu, svakako je utjecala na jednog stanovnika ili stanovnicu vile, koji su smatrali da je njihov dobri duh i zaštitnik Heraklo, mitski heroj i zaštitnik obližnjeg glavnog grada Pule. Baza vjerovanja je bila mitološka imaginacija i interpretacija o ambri kao proizvodu s rijeke Eridana ili Elektrida na sjeveru Jadrana, s jakim iscjeliteljskim obilježjima i odanost kultu transcendentnog zagrobnog života, u što su vjerovali Pseudo-Aristotel i Tales iz Mileta, a vjerovanje su preuzeli Rimljani, te u tu kultnu moć ljudi vjeruju i danas (Palavestra, Krstić 2006: 25–29).

amber jewellery, the rich Roman peninsula of Istria with its imperial and patrician estates must be hiding many other Roman amber findings alongside the unique amber ring and its interesting symbolism of Heracles. From prehistoric to Roman times, amber jewellery routes passed through Istria, continued into Liburnia and onwards along the Adriatic coast (Fadić 1998: 165, note 10); the repertory was predominantly Aquileian with specific traits determined by the higher social and economic status of their owners. Still, it should be emphasized that a similar ring was never found in Aquileia. Taking into account the existence of workshops in Herculaneum and the links maintained between Pula and Herculaneum by *Lucius Calpurnius Piso Caesonius*, one of the founders of the Roman colony of Pula together with *Lucius Cassius Longinus* (Marion, Tassaux 2009: 45–46), who had vast properties and lived in Herculaneum, we can presume that the amber ring arrived in the ager of the Pula colony and the Medulin area either via a deceased from Herculaneum or, simply, as an article of trade from the southern Campanian workshops.

It is a fact that, in spite of the presence of similar motifs (puppies, lion, erotes), no identical ring was found among the numerous items of Aquileian amber jewellery that have been discovered and processed to date. As the capital city of the ager, protected by Heracles and incorporating, in the 1st and 2nd century, the maritime residential complex at Vižula in Medulin, Pula must have influenced a male, or female, resident of a villa, who believed that Heracles, their guardian spirit and protector, was the mythical hero and protector of the nearby capital city of Pula. The belief was based on mythological imagination and the interpretation of amber as a product of the River Eridanos or the island of Elektris in the Northern Adriatic, possessed of powerful healing properties, and on the devotion to the cult of the transcendental, of life after death, as believed by Pseudo-Aristotle and Thales of Miletus. This belief was later adopted by the Romans and these cultic powers are still believed in by people today (Palavestra, Krstić 2006: 25–29).

IZVORI / SOURCES

- Cicero, Marcus Tullius, *De Finibus Bonorum Et Malorum/On Ends*, (prijevod H. Rackham), Loeb Classical Library 40, Harvard University Press, Cambridge, 1914.
- Homer, *Homerova Ilijada i Odiseja* (prijevod: T. Maretić), Zagreb, 1961.
- Ovidius, *Metamorfoze* (prijevod: T. Maretić), Zagreb, 1907.

- Ovidius *The poems of exile: Tristia and the Black Sea letters* (prijevod: P.Green) University of California Press, 2005.
- Plini Secundus, C. *Naturalis Historia* (prijevod: D.E. Eichholz), London, 1971.
- Tacitus, *The Agricola and the Germania* (prijevod: GH. Mattingly), Harmondsworth, 1973.
- Teofrast, *Peri lithon* (Περὶ λίθων) (izdanje: Didot), Paris, 1866.

LITERATURA / BIBLIOGRAPHY

- Bačić, B. 1960, Tumuli iz brončanog doba na Maklavunu i Žamnaku u Južnoj Istri, *Jadranski zbornik*, Sv. 4, 197–210.
- Batović, Š. 1981, Nakit u prapovijesti sjeverne Dalmacije, *Nakit na tlu sjeverne Dalmacije od prapovijesti do danas*, Zadar.
- Bonfante, G. 1985, The Word for Amber in Baltic, Latin, Germanic and Greek, *Journal of Baltic Studies*, vol. 16/3, Special Issue: Studies in Baltic Amber, 316–319.
- Budrys, R. 2001, Review of the literature on amber, *Baltic Amber*, Proceedings of the International Interdisciplinary Conference: Baltic Amber in Natural Sciences, Archaeology and Applied Art, Vilnius, 261–271.
- Buršič Matijašić, K. 1988/1989, Gradina Vrčin u okviru brončanog doba Istre, *Arheološki vestnik*, sv. 39–40, 475–494.
- Calvi, M. C. 1980, Le arti suntuarie, *Da Aquileia a Venezia*, Aquileia, 453–505.
- Calvi, M. C. 1984, Le collezioni di arti suntuarie del Museo di Aquileia, *Antichità Altoadriatiche*, vol. 24, 29–38.
- Calvi, M. C. 1996, Le ambre romane di Aquileia: aspetti e problemi, *Lungo la via dell'ambra*, *Atti del Convegno di Studio (Udine-Aquileia, 1994)*, Udine, 13–20.
- Calvi, M. C. 2005, *Aquileia. Le ambre romane*, Associazione nazionale per Aquileia, Aquileia.
- Delatte, A., Derchain, P. 1964, *Les intailles magiques gréco-égyptiennes*, Bibliothèque National – Cabinet des Médailles et Antiques, Paris.
- Drechsler Bižić, R. 1970, Zaštitna iskapanja pećine Golubnjače kod Kosinja, *Vjesnik Arheološkog muzeja u Zagrebu* s. 3., 6-7, 111–118.
- Drechsler Bižić, R. 1979/1980, Nekropola brončanog doba u pećini Bezdanjači kod Vrhovina, *Vjesnik Arheološkog muzeja u Zagreb*, s. 3., 12-13, 27–78.
- Džin, K. 2000, *Sjaj antičkih nekropola Mutile / Splendeur of Antique Mutila's Necropoles*, Katalog Arheološkog muzeja Istre, 58, Pula, 8–24.
- Džin, K. 2003, Katalog / Catalogue, in: *Sjaj antičkih nekropola Istre*, Monografije i katalozi, vol. 13, Pula, 109–170.
- Džin, K. 2004, I gioielli d'oro della necropoli di Burle (Medolino), *Atti, Centro di ricerche storiche*, vol. 34, 33–50.
- Džin, K. 2007, Anillo, in: *Roma. Senatus Populus Que Romanus*, Madrid, 291.
- Džin, K. 2009, A unique emerald Necklace from the Antique Necropolis of Burle near Medulin in Istria, *Histria antiqua*, vol. 18-1, 363–372.
- Fadić, I. 1995, Aenona e le ambre antiche, *Quaderni friuliani di archeologia*, vol. 5, 77–90.
- Fadić, I. 1996, Le ambre di Argyruntum, *Lungo la via dell'ambra*, *Atti del Convegno di Studio (Udine-Aquileia, 1994)*, Udine 89–111.
- Fadić, I. 1998, Antički jantar u Liburniji, *Izdanja Hrvatskog arheološkog društva*, 19, 159–167.
- Gabler, D. 1983, Rapporti commerciali tra Italia e Pannonia in età romana, *Archeologia Classica*, vol. 35, 88–117.
- Gagetti, E. 2000, Anelli di età romana scolpiti in ambra e in pietra dura della collezione di Toppo presso i Musei Civici di Udine, *Aquileia Nostra*, 71, 193–250.
- Gagetti, E. 2001, Anelli di età romana scolpiti in ambra e in pietre dure, *Arte e materia. Studi su oggetti di ornamento di età romana*, Milano, 191–481.
- Girardi Jurkić, V. 1980, Burle, Medulin, Istra – antički kosturni grob sa stelom, *Arheološki pregled*, sv. 21, 114–115.
- Girardi Jurkić, V. 1987, Antička i kasnoantička nekropola Burle kod Medulina. Prethodni izvještaj, 1979–1981, *Izdanja Hrvatskog arheološkog društva*, sv. 11/2, Pula, 167–188.
- Girardi Jurkić, V. 2002, Najznačajnije nekropole i groblja u prapovijesnoj, antičkoj i ranosrednjovjekovnoj Istri, *Histria antiqua*, vol. 8, 11–36.
- Girardi Jurkić, V., Džin, K. 2003, Značaj rimskih nekropola u Istri / The importance of the Roman Necropolises in Istria, in: *Sjaj antičkih nekropola Istre*, Monografije i katalozi, vol. 13, Pula, 47–105.
- Glogović, D. 1989, *Prilozi poznavanju želznog doba na sjevernom Jadranu, Hrvatsko primorje i Kvarnerski otoci*, Monografije 1, Jugoslavenska akademija znanosti i umjetnosti, Razred za društvene znanosti, Zavod za arheologiju, Zagreb.
- Gobić Bravar, Đ. 2009, Restauracija nekoliko jantarnih perli, *Vijesti konzervatora i muzealaca*, Hrvatsko muzejsko društvo, sv. 1-4, Zagreb, 124–128.
- Henkel, F. 1913, *Die römischen Fingerringe der Rheinland und der benachbarten Gebiete, I-II*, Berlin.
- Katičić, R. 1970, Podunavlje i Jadran u epu Apolonija Rođanina, *Godišnjak Centra za balkanološka ispitivanja Akademije nauka i umjetnosti Bosne i Hercegovine*, sv. 7, 71–132.
- Katičić, R. 1974, Liburnski otoci kod antičkih pisaca, *Zadarsko otočje*, Zadar, 35–45.
- Kolendo, J. 1981, *A la recherche de l'ambre Baltique. L'expédition d'un chevalier romain sous Néron*, Studia Antiqua, Warszawa.
- Kunow, J. 1985, Römisches Importgeschirr in der Germania libera bis zu den Markomannenkrieg – Metall - und Glasgefäße, *Aufstieg und Niedergang der Römischen Welt II*, vol. 12/3, New York – Berlin, 229–279.
- Maiuri, A. 1958, *Ercolano – I nuovi scavi, 1927-1958*, vol. 1, Roma.
- Mardešić, J. 2002, Jantar, *Longae Saloniae*, vol. 1, Split, 175–200.
- Marion, Y., Tassaux, F. 2009, Pola, les Colchides et Calpurnius Pison, *Histria antiqua*, vol. 18-2, 43–50.
- Maselli Scotti, F. 1996, Presupposti per l'individuazione di Aquileia come terminale della via dell'ambra in epoca romana, *Lungo la via dell'ambra*, Udine, 125–129.
- Mihovilić, K. 1986, Izložbeni predmeti prapovijesnog doba, Monografije i katalozi, sv. 3, 45–52.
- Palavestra, A., Krstić, V. 2006, *The Magic of Ambra*, National Museum, Beograd.
- Pauly-Wissowa, 1899, *Pauly's Real – Encyclopädia der classischen Altertumswissenschaft, III*, Stuttgart.
- Richter, G. M. A. 1971, *Engraved gems of the romans*, London.
- Ritter Zahony, E. 1889, Bernsteinfunde Aquilejas, *Mitteilungen der K. K., Central Commission zur Erforschung und Erhaltung der Baudenkmale(Wien)*, vol. 15, 102–106, 152–156, 244–251.
- Scatozza Hörich, L. A. 1989, *I monili di Ercolano*, Roma.
- Skok, P. 1971, *Etimološki rječnik hrvatskog ili srpskog jezika*, Zagreb.
- Soproni, S. 1990, L'importanza della strada dell'ambra nello sviluppo delle città pannoniche, *La Venetia nell'area padano-danubiana. Le vie di comunicazioni*, Padova, 349–354.
- Spekke, A. 1957, *The Ancient Amber Routs and the Geographical Discovery of the Eastern Baltic*, Stockholm.
- Sprincz, E. 1957, Anelli d'ambra del Museo Nazionale Ungherese, *Folia Archaeologica*, 9, 101–117.
- Srejić, D., Čermanović, A. 1979, *Rečnik grčke i rimske mitologije*, Beograd.
- Šašel, J. 1966, *Barbii, Eirene*, vol. 5, 134–137.
- Uggeri, G. 1985, Relazioni marittime tra Aquileia, la Dalmazia e Aleksandria, *Antichità Altoadriatiche*, vol. 26, 159–182.
- Worftmann, D. 1966, Kosmogonie und Nilflut, Studien zu einigen Typen magischer Gemmen griechisch-römischer Zeit aus Ägypten, *Bonner Jahrbücher*, vol. 166, 62–112.

