

## Archaeological palynology in Romania — a review of its past and current state

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**Abstract.** *Pollen analyses in Romanian archaeology are not new and the interest concerning the opportunities offered by this discipline is on the rise. The increasing visibility of the discipline reflects a mentality change in terms of research methodology in Romanian archaeology, especially in prehistoric archaeology. This paper will focus on a short critical survey of the development of archaeological palynology in Romania, from its beginning in the early 20<sup>th</sup> century to present.*

**Rezumat.** *Analizele de polen nu reprezintă o noutate în România, iar interesul pentru oportunitățile oferite de palinologie este în creștere. Interesul crescând pentru această disciplină dezvăluie o schimbare de mentalitate în ceea ce privește metodologia de cercetare în arheologia românească, în special în arheologia preistorică. Lucrarea de față se concentrează pe o scurtă trecere în revistă critică a dezvoltării palinologiei arheologice în România, de la începuturile sale în prima parte a secolului XX până în prezent.*

**Keywords:** palynology, archaeology, prehistory, Romania, palaeoenvironment.

### Introduction

The study of palaeoenvironments raises for several years an increased interest among archaeologists, palynology playing an ever more important role in the archaeological literature. Since the discipline deals with the study of pollen and spores, it is mainly used to reconstruct vegetation history and it has proved to be a good tool to reconstruct the past and to construct archaeological scenarios with an ever growing level of complexity, through the integration of the natural environment as an explanatory factor of human behaviour, or through the integration of the anthropogenic impact as a shaping element of the environment. From this point of view, archaeological palynology highlights aspects of the existing interactions between ancient human communities and their environment from the point of view of their agricultural practices, but may also shed light on other different

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quotidian aspects such as ancient diets<sup>3</sup>, funeral practices<sup>4</sup>, the function and use of various classes of artefacts<sup>5</sup> etc.

### **Archaeological background**

We must clarify from the onset that we will restrict our interest to the Neolithic and Chalcolithic, these being the prehistoric periods with the most intense and dynamic research activity. For Romania, situated in Eastern Europe, the Neolithic period starts at approximately 6600 BC, with the arrival of the agricultural populations characterised by the Starčevo-Criș painted pottery, which spread over the entirety of its current territory. These are later replaced in the western part of the territory by populations producing Vinča type pottery, while the east is occupied by late LBK communities. The transition to Chalcolithic marks the ending of massive population movements and the beginning of local cultural synthesis. In the south and west we must note the evolution from Dudești roots of the Gumelnița culture (part of the Gumelnița-Kodžadermen-Karanovo VI cultural complex). The south-west and west are dominated by the presence of the Sălcuța culture (part of the Sălcuța-Krivodol-Bubanj cultural complex) and Tisza, Tiszapolgár and the Bodrogkeresztúr cultures, while in the east we observe the evolution of Precucuteni and Cucuteni cultures, components of the Ariușd-Cucuteni-Trypillia cultural complex. The Chalcolithic period ends at approximately 3000 BC, with the beginning of EBA. However, due to the predominance of a positivistic approach towards the study of prehistoric communities<sup>6</sup>, it is only recently that aspects concerning the complex relationship between ancient human communities and the environment has entered the focus of Romanian archaeologists.

### **Historical review of archaeological palynology in Romania**

In Europe since the '50s, archaeologists have collaborated with other researchers (biologists, geologists, pedologists, etc.) in an attempt to identify the natural environment in which human communities have evolved during prehistory and protohistory. These collaborations started from the desire to explain certain processes of landscape transformation and to understand important shifts in humanity's existence such as the emergence of agriculture and its consequences: increased demographic pressure and migration. Palynology has been shown to contribute, through the study of spores and pollen

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<sup>3</sup> BERG 2002.

<sup>4</sup> LEROY-GOURHAN 1968.

<sup>5</sup> ADAMS, GASSER 1980; PEARSALL 2000.

<sup>6</sup> ANGHELINU 2004; BODI 2012.

grains, to a fuller understanding of the prehistoric sites investigated by archaeologists<sup>7</sup>. As a secondary effect, with the increase of archaeo-palynological studies the existence of the human impact on the ancient vegetation cover has also been noticed and constituted itself into a matter of concern.

In Romania, palynology investigations are conducted since the early twentieth century<sup>8</sup>. Following this primary initiative, Emil Pop created a palynological school in Cluj<sup>9</sup>, where the evolution of the vegetation during the Holocene was reconstructed through the study of sedimentary sequences originating from peat bogs. The activity of the group continues to the present with exceptional results<sup>10</sup>. However, only a small fraction of their studies impact on the archaeological research<sup>11</sup>.

Later, Marin Cârciumaru organized in Bucharest the first Archaeo-Palynology Laboratory in Romania (initially created in 1968 in Craiova), where a special attention was paid to the analysis of pollen spectra from Palaeolithic settlements. As a result of the laboratory's activity, in 1980 an ample monograph was published on the environment of upper Pleistocene in Romania<sup>12</sup>. Later on this direction of research has lost momentum and, starting with the '80s, the focus switched on the study of Chalcolithic sites from Moldova. This change of priorities may find an explanation in the earlier publication of the results of a study conducted on the Neolithic site from Vădastra<sup>13</sup>. The study of the vegetation and climate change during the Neolithic and Chalcolithic was continued by the Archaeo-Palynology Laboratory through further pollen analysis from the Chalcolithic site at Drăgușeni-Ostrov (Moldova)<sup>14</sup>. It allowed the reconstitution of the subsistence systems employed by the Cucuteni communities during fifth and fourth millennia BC. These data were complemented through the investigations from Târpești (Neamț county), where Marin Cârciumaru obtained thought-provoking results concerning the agricultural practices during the fifth millennium BC, but also on deforestation caused by sedentary farmers and climate change during the final period of the Atlantic<sup>15</sup>.

In 1994 Marin Cârciumaru and Alexandru Tomescu published the first book in Romanian dealing with methodological issues on the integration of palynological investigations in

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<sup>7</sup> RICHARD 1999.

<sup>8</sup> POP 1929.

<sup>9</sup> POP 1943; 1945; 1960.

<sup>10</sup> TANȚĂU *et al.* 2009; 2011; FEURDEAN *et al.* 2011; *etc.*

<sup>11</sup> FEURDEAN, ASTALOȘ 2005; FĂRCAȘ *et al.* 2003.

<sup>12</sup> CÂRCIUMARU 1980.

<sup>13</sup> LEROI-GOURHAN *et al.* 1967.

<sup>14</sup> MARINESCU-BÎLCU *et al.* 1984.

<sup>15</sup> MARINESCU-BÎLCU *et al.* 1985.

archaeological research<sup>16</sup>. Two years later, Marin Cârciumaru published a monograph that included his palynological studies carried out in prehistoric settlements from Romania<sup>17</sup>.

We cannot end this short review without mentioning a synthesis paper published in 2000 by Alexandru Tomescu, where all palynological studies conducted during 1967-1999 for 10 archaeological sites located within the Romanian Plain are critically examined<sup>18</sup>.

### **Review of past research**

While in the '80s, in Europe, palynological studies were successfully applied in archaeology, in the Romanian archaeological literature such occurrences had an exceptional character. Later on, such investigations made a shy debut and these do however require some critical observations regarding the methodology, especially the studies previous to the year 2000.

The first aspect refers to the fact that the palynological investigations tried to address issues related to the reconstruction of vegetation and climate evolution starting from samples originating from a strongly anthropized context. That is to say that many of the samples were collected from cultural layers found within the archaeological sites<sup>19</sup> and thus it is obvious that the pollinic spectrum obtained bears a heavy imprint of human activity. In natural environments, pollen “rain” offers rigorous information about vegetation from a certain territory<sup>20</sup>, but within an archaeological site, many other factors act in a manner which distorts the real image of the vegetation in the surrounding area. Among these, the human action is an essential sedimentation vector and an aspect often overlooked<sup>21</sup>. Contamination with pollen brought within the site, voluntarily or involuntarily, through human actions and stratigraphic disturbances, are factors that influenced pollen spectra obtained from archaeological sediments<sup>22</sup>. Since it is common knowledge the fact that the reconstitution of the surrounding vegetal environment of an archaeological site, starting from data derived from the analysis of the inhabited area constitutes the exception rather than the rule<sup>23</sup>, the palaeovegetation and palaeoclimate reconstruction which might be thus obtained becomes questionable. We must also add that another factor that must be accounted for when interpreting the pollen spectrum is the phenomenon of differential preservation of pollen grains. It has been demonstrated that, most often, the nature of archaeological sediments is

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<sup>16</sup> CÂRCIUMARU, TOMESCU 1994.

<sup>17</sup> CÂRCIUMARU 1996.

<sup>18</sup> TOMESCU 2000.

<sup>19</sup> CÂRCIUMARU 1996.

<sup>20</sup> HEIM 1970.

<sup>21</sup> RICHARD 1994.

<sup>22</sup> TOMESCU 2000.

<sup>23</sup> RICHARD 1994.

not suitable for optimal pollen preservation<sup>24</sup>. In this context, any opinion regarding the reconstruction of palaeovegetation and palaeoclimate may be considered hazardous at best.

Another issue refers to the manner in which the results are being published, quite often with missing or incomplete information. Such is the case of the number of pollen grains counted for each sample and the number of samples analysed since, in most of cases, the published results do not mention the minimum number of pollen grains per sample. Often, even the number of samples which were analysed from a palynological point of view is not specified. However, when these data are presented, their values are statistically insufficient for the study to be valid. Secondly, although some studies present definitive results, the palynological analyses are not accompanied by pollen diagrams, but only tables with percentages, although the content of the samples would have allowed for the completion of diagrams. In several cases where pollen diagrams are presented, the accompanying stratigraphic data are either vague or missing. A similar situation may be observed when dealing with corroboration with absolute chronology. When <sup>14</sup>C data are presented, these lack the specification of the type of the sample used and, in most cases, palynological analyses performed on samples from surveys carried out outside the archaeological site do not benefit from absolute dating<sup>25</sup>.

### **Current state of research**

Currently in Romania, multi- and interdisciplinary researches are focused especially on sites dating from the Neolithic and Chalcolithic and palynology constitutes common occurrence when the reconstitution of the palaeoenvironment is sought after.

The Neolithic economy and the diversification of occupations (specialised crafts, plants cultivation, animal breeding) have led to a certain decrease in the mobility of human communities, which in addition to the need for farming land, in the context of existence of an extensive agriculture, led undoubtedly to a complex process of deforestation with a strong environmental impact.

Today, the pollen spectra obtained from within archaeological sites are correlated, through radiocarbon dating, with the spectra obtained from wet environments, especially swamps, leading to the construction of the evolution of post-glacial vegetation; pollen spectra from within the archaeological sites offer information on plants and eventually the plant environment belonging to the specific loci of occupation, pollen spectra of wetlands in its vicinity allow the assessment of long term anthropogenic impact on palaeoenvironment.

The use of palaeobotanical indicators, such as pollen and non-pollen palynomorphs allows further finer analysis on the agro-pastoral practices of prehistoric human communities. Non-

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<sup>24</sup> KING *et al.* 1975; HALL 1981.

<sup>25</sup> CÂRCIUMARU 1972; 1977; 1979; ALEXANDRU 1990.

pollen palynomorphs may highlight the location of stables and animal pens being used successfully in the study of north-European archaeological sites<sup>26</sup>. Non-pollen palynomorphs analysis can be performed either on archaeological deposits or coprolites (when present). It must be highlighted that non-pollen palynomorphs study has been rather overlooked until present in Romania<sup>27</sup>.

In eastern European countries (Hungary, Bulgaria, Ukraine etc.) there are numerous programmes for coherent analysis of subfossil pollen to reconstitute the vegetation, climate and agriculture during prehistoric period and protohistory<sup>28</sup> and, in the last decade in Romania are also made efforts to align this line of research to international standards, both through national projects funded by the National Research Council (CNCS), but, also, through collaboration with researchers affiliated to various laboratories in Europe.

Since 2004, a Romanian-French project on focused on the study of salt water springs exploitation, provided also a series of palynological data which highlight the impact of salt exploitations on the natural environment surrounding the salt springs areas<sup>29</sup>.

Palynological investigations are also conducted within the “Integrated analysis of archaeological, pedological, palynological and archaeozoological data from Eneolithic sites in NE Romania” project which is a CNCS PN II project (code TE 172/2010), which aimed to conduct complex interdisciplinary investigations on several Neolithic and Chalcolithic settlements<sup>30</sup>.

The CNCS project PN-II-ID-PCE-2011-3-0982 “Human and environment co-evolution patterns in the wetland area of Balta Ialomiței”<sup>31</sup> aims to define the specific characteristics of human communities (from the Neolithic to the Middle Ages) by underlining their connection to the natural environment. In this context, the palynological research focuses on the reconstruction of palaeoenvironmental changes and the impact of human activities on the landscape (agriculture, animal breeding) through pollen analysis from a combination of natural sequences and archaeological records.

## Conclusions

The archaeo-palynological research from Romania had a delayed start compared to other countries from Central and Western Europe. It would have been a beneficial aspect if the situation could have been used to build collaborations with colleagues from abroad in order

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<sup>26</sup> van GEEL *et al.* 2003; BOS *et al.* 2005.

<sup>27</sup> DANU *et al.* 2010.

<sup>28</sup> SKAKUN 1993; DOLUKHANOV 1995; 1997; KREMENETSKI 1997; PASHKEVICH 1997.

<sup>29</sup> WELLER *et al.* 2009; DANU *et al.* 2010.

<sup>30</sup> *Integrated analysis* n. d.

<sup>31</sup> *Human & Environment* n. d.

to assimilate a correct working methodology in the field. However, as presented above, this is not the case and the causes are multiple: lack of funding, absence of Romanian researchers interested to develop research programs in this area, poor access to information, but, also, the—still present—dominance of a cultural-historical approach within the archaeological practice. All these issues have put their imprint on the development of a truly interdisciplinary approach on landscape archaeology. Nevertheless, past pollen analyses are important through the constitution of a preliminary knowledge pool concerning the palaeoenvironment, but, most importantly, in our opinion, it kept an opened communication between palynologists and archaeologists.

Today, due to both the existence of this type of background, as well as to the development of research networks, and the implementation of different research funding programs, the archaeological palynology in Romania began to be considered an indispensable tool in multi- and interdisciplinary research sites. The real-time access to specialised publications and the regular exchange of information between researchers reflects positively on the advancement of archaeological palynology.

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