

1 **Kerogen evaluation and palynology of Upper Cretaceous and Oligocene**
2 **deposits in the northern part of the Romanian Eastern Carpathians**

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6 **Abstract.** Six geological cross-sections, discussed in the current
7 research, are located in the Sucevița area (Suceava county, Roma-
8 nia). Almost all the studied outcrops consist of Upper Cretaceous
9 sediments of the Hangu Formation, but one of them shows black
10 shales that can be assigned to Lower Dysodilic Shale Formation
11 of Oligocene age. The marine Hangu Formation yielded an assem-
12 blage of dinocyst markers represented by *Cladopyxidium paucire-*
13 *ticulatum*, *Alterbidinium varium*, *Trithyrodinium evittii*, *Isabelid-*
14 *inium majae*, and terrestrial palynomorphs (i.e. *Polypodia-*
15 *ceoisporites hojrupensis*, *Pseudopapillopollis cf. praesubhercyni-*
16 *cus*) that supports a Maastrichtian age. The younger palynological
17 assemblage recovered from the Lower Dysodilic Shale Formation
18 is represented by dinoflagellate cysts such as *Deflandrea phospho-*
19 *ritica*, *Areosphaeridium diktyoplokum*, *Thalassiphora pelagica*,
20 and numerous Pinaceae (e.g. *Pinuspollenites* div. sp.), mainly sug-
21 gesting Rupelian age.

22 The evaluation of the kerogen from the rocks was based on the
23 palynofacies and organic geochemistry. The results inferred from
24 gas chromatography–mass spectrometry (GC-MS) analysis sug-
25 gest a type III kerogen for the Upper Cretaceous deposits, and
26 mixed kerogen (type II/III) for the Oligocene ones. The Hangu
27 Formation mainly contains opaque phytoclasts and woody tissues
28 of continental origin, while the Lower Dysodilic Shale Formation
29 shows different palynofacies dominated by Amorphous Organic
30 Matter of marine origin. Regarding the potential of the source
31 rocks, the Total Organic Carbon (TOC) values indicate a low con-
32 tent (0.51 - 0.78%) for the Upper Cretaceous sediments. In con-
33 trast, an increase in TOC content up to 3.44% was outlined for
34 Oligocene deposits, allowing them to be considered source rocks
35 with very good potential.

36 This study also aims to reveal the palaeoenvironment and palaeo-
37 climate conditions during the Upper Cretaceous and Lower Oligo-
38 cene in the Eastern Carpathians.

39 **Keywords:** northern Tethys, organic geochemistry, palynology,
40 source rock evaluation.

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