

Catalogue of the fossil Cenozoic plants of Republic of North Macedonia

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Abstract

Taxa of the North Macedonian Cenozoic macroflora published in the period 1922-2021 are presented. Fossil material from the National Historical Museum in Belgrade originating from Cenozoic deposits in Republic of North Macedonia is also presented. The taxa have been identified as imprints of leaves and disseminules. Each taxon is presented with its geographical location, and a schematic map of RN Macedonia includes all cited locations. The interval of the stratigraphic distribution of each taxon, where it is published or known, is also given. Some of the taxa have been revised. They are indicated as *hoc loco*.

Introduction

This catalog contains all plant paleotaxa that have been established as macroremains from Cenozoic flora localities on the territory of the RN Macedonia (Fig. 1). It contains both published data in the period 1922-2021 and fossil materials stored in museum collections.

According to stratigraphy, the plants are from the Paleogene, Neogene and Quaternary (marked in the text as "sub-recent") systems. Most of the plants belong to the Paleogene period and are mostly found in coal, sandstone, marl, and clay sediments.

All palaeofloras from RN Macedonia which are in the Natural History Museum in Belgrade (NHMBEO) were collected during the period 1914-1950. (Coll. Nos. NHMBEO 600 PALBOT: 58; 78; 79; 80; 81; 82; 83; 84; 85; 86; 90; 91; 92; 93; 94; 148; 165). Most of them were collected by the academician Petar S. Pavlović and by botanist Pavle Ivanović Černajvski. A significant contribution to the collections was also made by the Macedonian geologist Nikolai Izmajlov, who donated several palaeofloras. This fossil material hosted by

NHMBEO was determined by Pavle Ivanović Černajvski in the period 1930-1950 and by Desa Djordjević Milutinović during the year 2022. In the text, this is indicated by the name of the person who determined the material and the abbreviation "in collect." (In collection). The age of the palaeoflora was proposed by Desa Djordjević Milutinović only on the basis of palaeofloristic material, except in the case of Živojno, where the age was determined by Laskarev (1950). When determining the age of the palaeoflora, the proportion between the two basic morphotypes - broad leaf evergreen (BLE) and broad leaf deciduous (BLD) - was primarily taken into account. Comparisons were made mainly with the Tertiary floras of Serbia, Montenegro, RN Macedonia and Croatia, and based on this, an age proposal was made.

In terms of systematic palaeobotany, the Cenozoic macroflora of RN Macedonia consists of representatives of the following divisions: *Equisetophyta*, *Polypodiophyta*, *Pinophyta* and *Magnoliophyta*.

As the most general characteristics of the Cenozoic macroflora, the following conclusions can be drawn:

1. In the group of higher plants the taxa are distribut-

ed quantitatively as follows:

Divisio *Equisetophyta*: 1 species

Divisio *Polypodiophyta*: 6 species, 1 taxon defined by genus level

Divisio *Pinophyta*: 16 species, 10 taxa defined by genus level and 10 with unclear status (*genera et species indet.*).

Divisio *Magnoliophyta*: 159 species, 103 taxa defined by genus level and 60 with unclear status (*genera et species indet.*).

2. Four genera are represented by one to two species in the group of ferns and there is no dominant genus.

3. Thirteen genera are registered in the group of gymnosperms. The genus *Pinus* is dominant.

4. A total of 82 genera have been determined in the group of angiosperms and the highest diversity has been registered in the following genera: *Quercus* (18 taxa), *Populus* (8), *Acer* (8), *Alnus* (7), *Fabaceae* (6), *Myrica* (6), and *Ulmus* (6).

5. The highest genus diversity has been established in the following families: Lauraceae (9 genera), Betulaceae (5), and Fagaceae (4).

The catalogue has the following structure:

the species are grouped according to the systematic divisions to which they belong;

within the framework of divisions, the taxa are arranged according to the genera and species, in an alphabetical order;

for every species a citation block is given that includes the citation of the accepted name, the basionym, the more important synonyms from a nomenclature point of view, and all North Macedonian sources in which it has been described or recorded;

under the heading "**Material**" the type of the fossil organ is given, on the basis of which the species has been determined: Lf = imprints of leaves, leaflets, needles and leafy twigs in Pinophyta; Ds = disseminules - in that category seeds, fruits, cones (strobiles) have been included. In an insignificant number of cases, besides these two basic fossil categories, the type of the fossil part is also given;

under the heading "**Collection**" the abbreviation MNHRNM stands for the National Institution Museum of Natural History of Republic of North Macedonia; the

abbreviation NHMBEO stands for the Natural History Museum in Belgrade; the abbreviation IBER stands for the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences. Whenever the authors have not pointed out in which collection the fossil samples are stored, they are marked as "unknown".

All species of the North Macedonian Cenozoic flora are listed by the name of their locality; the lithostratigraphic unit of origin of the fossils; and the chronostratigraphic range of the flora-bearing sediments where it is published or established. As that range is not always exactly dated, the most probable interval is given to which the flora-bearing sediments belong;

in a number of cases a revision has been carried out, either on the basis of the original fossil materials, or on photographic illustration of the originals. The results of the revision are featured under the heading "**Rev.**" by the name of the corresponding authors;

an insignificant part of the taxa has been revised during the final stages of the catalogue compilation and then the name of the author is supplemented with "*hoc loco*";

the names of the taxa whose taxonomic status has been changed are listed only in "*italic*" and the correct names in "**bold**" and "*italic*";

the generic names of the taxa with disputable systematic position are given in inverted commas.

the name of all registered species is written in Latin, according to the rules, while in the citation blocks are given according to the data source.

I. Divisio EQUISETOPHYTA

EQUISETITES Sternb. – EQUISETACEAE

Equisetites ebreichii Ett.

1854. *Equisetites ebreichii* Ettingshausen, p. 25, Pl. 1, Figs 6-7.

1954. Pantich, p. 169.

Material: Stem

Location and stratigraphical range: Nemanjica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

II. Divisio POLYPODIOPHYTA

A

ASPLENIUM L.- ASPLENIACEAE

***Asplenium scolopendrium* L.**

1930. *Scolopendrium vulgare* Sm.; Černjavski, p. 257, Text-fig. 4: 7.

Material: Lf

Location and stratigraphical range: Valandovo (Sub-recent).

Collection: unknown

L

LASTRAEA Presl. – DRYOPTERIDACEAE

***Lastraea polypodioides* (Ett.) Heer**

1854. *Goniopteris polypodioides* Ettingshausen, p. 26, Pl. 2, Figs 1-4; Pl. 3, fig. 5.

1859. *Lastraea (Goniopteris) polypodioides* Heer, p. 151, Pl. 144, Figs 1-3.

1988. Milovanović & Mihajlović, p. 335, Pl. 1, Fig. 1.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

O

OSMUNDA L. – OSMUNDACEAE

***Osmunda lignitum* (Giebel) Stur**

1857. *Pecopteris lignitum* Giebel, p. 303, Pl. 2, Fig. 2a.

1870. *Osmunda lignitum* (Giebel) Stur, p. 5.

1988. Milovanović & Mihajlović, p. 335, Pl. 1, Figs 3, 5.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

***Osmunda parschlugiana* (Unger) Andr.**

1847. *Pteris parschlugiana* Unger, p. 122, Pl. 36, Fig. 6.

1959. *Osmunda parschlugiana* (Unger) Andreánszky, p. 49, Pl. 7, Fig. 4.

1993. Kitanov, p. 61, Pl. 1, Figs 1-2.

Material: Lf

Location and stratigraphical range: Lukovo (Lower Pliocene).

Collection: IBER

P

PTERIDIUM Gleditsch ex Scop. - DENNSTAEDTIACEAE

***Pteridium aquilinum* (L.) Kuhn foss.**

1956. *Pteridium* sp., Pantich & Nikolich, p. 82, Pl. 2, Fig. 1.

1996. *Pteridium aquilinum* (L.) Kuhn foss.; Kitanov, p. 61, Pl. 1, Figs 1-3.

Material: Lf

Location and stratigraphical range: Oslomej – Kičevo Coal Basin (Dacian); Živojno (Romanian).

Collection: IBER (Živojno)

***Pteridium oeningense* (Unger) Hantke**

1847. *Pteris oeningense* Unger, p. 124, Pl. 37, Figs 6-7.

1954. *Pteridium oeningense* (Unger) Hantke, p. 40, Pl. 1, Figs 6-7.

1988. Milovanović & Mihajlović, p. 335, Pl. 1, Figs 2, 4.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

***Pteridium* sp.**

1956. Pantich & Nikolich, p. 82, Pl. 2, Fig. 1.

Rev. 1996. *Pteridium aquilinum* (L.) Kuhn foss.; Kitanov, p. 61, Pl. 1, Figs 1-3.

S

***Scolopendrium vulgare* Sm.**

1930. Černjavski, p. 257, Text-fig. 4: 7.

Rev. *Asplenium scolopendrium* L.; Bozukov, *hoc loco*.

III. Divisio PINOPHYTA

A

Abies sp.

1979. Pantich, Dumurtzanov & Pavlovski, p. 27.

Material: Lf

Location and stratigraphical range: Carina, Leskovec (Upper Pliocene).

Collection: unknown

C

CEPHALOTAXUS Siebold & Zucc. - CEPHALOTAXACEAE

Cephalotaxus aff. *C. fortunei* Hook. foss.

1993. Kitanov, p. 63, Pl. 1, Fig. 3.

Rev. *Cephalotaxus fortunei* Hook. foss.; Bozukov, *hoc loco*.

Cephalotaxus fortunei Hook. foss.

1993. *Cephalotaxus* aff. *C. fortunei* Hook. foss.; Kitanov, p. 63, Pl. 1, Fig. 3.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Lukovo (Lower Pliocene); Suvodol (Pliocene).

Collection: IBER (Lukovo); MNHRNM (Suvodol)

Cephalotaxus olrikii (Heer) Menzel

1868. *Taxites olrikii* Heer, p. 95, Pl. 1, Figs 21-24; Pl. 45, Figs 4a-c.

1900. *Cephalotaxus olrikii* (Heer) Menzel, p. 102, Pl. 5, Figs 11-12.

1922. Pax, p. 303.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

CRYPTOMERIA D. Don - TAXODIACEAE

Cryptomeria anglica Boulter

1859. *Araucarites sternbergii* auct. (non Göpp.); Heer, pp. 316, 317.

1868. *Sequoia sternbergii* auct. [non (Göpp.) Heer]; Heer, p. 140, Pl. 24, Figs 7-10.

1954. *Sequoia sternbergii* (Göpp.) Heer; Pantich, p.166.

1970. *Cryptomeria anglica* Boulter, p. 280, Pl. 1, Figs 1-9; Text-figs 1-2.

1994. *Sequoia sternbergii* (Göpp.) Heer; Mihajlovič, Ljubotenski, p. 204.

2005. *Cryptomeria anglica* Boulter; Denk et al., p. 378, Figs 45-49.

Material: Lf

Location and stratigraphical range: Nemanjica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

G

GLYPTOSTROBUS Endl. – TAXODIACEAE

Glyptostrobus europaeus (Brongn.) Unger

1833. *Taxodium europaeum* Brongniart, p. 168.

1850. *Glyptostrobus europaeus* (Brongn.) Unger, p. 434.

1922. Pax, p. 304.

1996. Kitanov, p. 61, Pl. 1, Fig. 6.

2004. Mihajlovič & Lazarevič, p. 286, Pl. 1, Fig. 2.

2021. Bozukov et al., p. 14.

Djordjevič Milutinović, *in collect*.

Material: Ds, Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene); Skopje (Miocene); Bitola (Upper Pontian - Lower Dacian); Živojno (Romanian); Suvodol, Vitolište (Pliocene).

Collection: IBER (Živojno); MNHRNM (Suvodol, Vitolište); NHMBEO (Skopje - Kisela Voda mine/Nerezi Village); unknown (Bitola, Skopje Miocene).

J

JUNIPERUS L. - CUPRESSACEAE

Juniperus excelsa M. Bieb. foss.

1930. Černjavski, p. 251, Text-fig. 1: 8; Text-fig. 2: 6.

Černjavski, *in collect.*

Material: Lf, twig

Location and stratigraphical range: Matka and Berovo, Monastery Matka (sub-recent).

Collection: NHMBEO (Matka and Berovo); unknown (Monastery Matka).

Juniperus excelsa* M. Bieb. f. *retinospora

1930. Černjavski, p. 251.

Material: Lf

Location and stratigraphical range: Monastery Matka (sub-recent).

Collection: unknown

L

LIBOCEDRITES Endl. - CUPRESSACEAE

***Libocedrites salicornioides* (Unger) Endl.**

1838. *Hellia salicornioides* Unger, p. 101 (nom. illegit.).

1841. *Thuytes salicornioides* Unger, p. 11, Pl. 2, Figs 1-4.

1847. *Libocedrites salicornioides* (Unger) Endlicher, p. 275.

2021. Bozukov et al., p. 14.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene); Vitolište (Pliocene).

Collection: MNHRNM (Vitolište); NHMBEO (Skopje).

P

PINUS L. - PINACEAE

***Pinus aff. halepensis* Mill.**

1929. Stojanoff & Stefanoff, p. 18, Fig. 7; Pl. 3, Fig. 1; Fig.-text 4.

2021. Bozukov & al., p. 15.

Material: Ds

Location and stratigraphical range: Suvodol (Pliocene).

Collection: MNHRNM

***Pinus hepios* (Ung.) Heer**

1852. *Pinites hepios* Unger, p. 25, Pl. 13, Figs. 6-9.

1855. *Pinus hepios* (Ung.) Heer, p. 57, Pl. 21, Fig. 7.

2004. Mihajlović & Lazarević, p. 286, Pl. 1, Fig. 10.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene); Čiflik, Ljuboš, Ljubočka River (Miocene); Bitola (Upper Pontian - Lower Dacian).

Collection: NHMBEO; unknown (Bitola).

***Pinus salinarum* (Partsch) Zablocki**

1847. *Pinites salinarum* Partsch in Endlicher, p. 288 (nomen).

1928. *Pinus salinarum* (Partsch) Zablocki, p. 184, Pl. 7, Figs 1-4.

2004. Mihajlović & Lazarević, p. 288, Pl. 1, Fig. 11.

Material: Ds

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

***Pinus sp. cf. P. kremnensis* Anić**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Pinus sp. 1

1979. Pantich, Dumurtzanov & Pavlovski, p. 27.

Material: Ds, Lf

Location and stratigraphical range: Carina, Leskovec (Upper Pliocene).

Collection: unknown

Pinus sp. 2

1922. Pax, p. 304.

Material: Ds, Lf

Location and stratigraphical range: Skopje

(Miocene).

Collection: unknown

Pinus sp. 3

Djordjević Milutinović, *in collect.*

Material: Ds

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Pinus sp. 4

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Pinus sp. 5

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Pinus sp. 6

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

Pinus sp. 7

Djordjević Milutinović, *in collect.*

Material: Ds

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

***Pinus tetaeformis* Ung. cf. *P. kremnensis* Anić**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela

Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

PROTOSEQUOIA Miki - TAXODIACEAE

***Protosequoia cf. hardtii* (Goepf.) Mai**

1954. *Sequoia langsdorfii* (Brong.) Heer; Pantich, p. 166, Pl. 60, Fig. 2.

1994. cf. *Protosequoia hardtii* (Göpp.) Mai; Mihajlovič & Ljubotenski, p. 204, Pl. 1, Figs 12-15.

Material: Lf

Location and stratigraphical range: Nemanjica, Sudik – Ovče Polje Basin (Upper Eocene).

Collection: unknown

S

SEQUOIA Endl. - TAXODIACEAE

***Sequoia abietina* (Brongn. in Cuvier) Knobloch**

1822. *Phyllites abietina* Brongniart in Cuvier, p. 617, Pl. 2, Fig. 13.

1922. *Sequoia langsdorfii* (Brongn.) Heer; Pax, p. 305.

1948. Černjavski, p. 51, Pl. 2, Fig. 1.

1964. *Sequoia abietina* (Brongn. in Cuvier) Knobloch, p. 601.

1993. Kitanov, p. 62, Pl. 1, Fig. 4.

1996. Kitanov, p. 62, Pl. 1, Fig. 5.

Material: Lf

Location and stratigraphical range: Skopje (Miocene); Lukovo (Lower Pliocene); Vranjevci, Živojno (Upper Pliocene).

Collection: IBER (Lukovo, Živojno)

***Sequoia couttsiae* Heer**

1954. Pantich, p. 166, Pl. 60, Fig. 2.

1994. *Sequoia cf. couttsiae* Heer; Mihajlovič & Ljubotenski, p. 204, Fig. 2B.

Material: Lf

Location and stratigraphical range: Sheboa – Ovče Polje Basin (Upper Eocene).

Collection: unknown

Sequoia langsdorfii (Brongn.) Heer

1922. Pax, p. 305.

Rev. *Sequoia abietina* (Brongn. in Cuvier) Knobloch; Bozukov *hoc loco*.

1948. Černjavski, p.51, Pl. 2, Fig. 1.

Rev. 1984 *Sequoia abietina* (Brongn. in Cuvier) Knobloch; Kitanov, p. 49, Text-fig. 6.2.

1954. Pantich, p. 166, Pl. 60, Fig. 2.

Rev. 1994. *Protosequoia cf. hardtii* (Göpp.) Mai; Mihajlovič & Ljubotenski, p. 204, Pl. 1, Figs 12-15.*Sequoia sternbergii* (Göpp.) Heer

1954. Pantich, p. 166.

1994. Mihajlovič & Ljubotenski, p. 204.

Rev. 2005. *Cryptomeria anglica* Boulter, Denk et al., p. 378, Figs 45-49.

T

TAXODIUM Rich. – TAXODIACEAE

Taxodium dubium (Sternb.) Heer1833. *Phyllites dubius* Sternberg, p. 37, Pl. 36, Figs 3-4.1855. *Taxodium dubium* (Sternb.) Heer, p. 49, Pl. 17, Figs 5-15.2004. *Tetraclinis cf. brachyodon* (Brongn.) Mai & Walther; Mihajlovič & Lazarevič, p. 286, Pl. 1, Figs 3-5.Djordjevič Milutinović, *in collect*.**Material:** Lf**Location and stratigraphical range:** Skopje (Oligocene); Bitola (Upper Pontian - Lower Dacian).**Collection:** NHMBEO; unknown (Bitola).

TAXUS L. - TAXACEAE

Taxus aff. baccata L.Djordjevič Milutinović, *in collect*.**Material:** Lf**Location and stratigraphical range:** Skopje (Oligocene).**Collection:** NHMBEO

TETRACLINIS Mast. - CUPRESSACEAE

Tetraclinis cf. brachyodon (Brongn.) Mai & Walther1822. *Equisetum brachyodon* Brongniart, p. 328, Pl. 16, Fig. 3.1985. *Tetraclinis brachyodon* (Brongn.) Mai & Walther, p. 30, Pl. 3, Figs 17-19.2004. *Tetraclinis cf. brachyodon* (Brongn.) Mai & Walther; Mihajlovič & Lazarevič, p. 286, Pl. 1, Fig. 1.**Material:** Lf**Location and stratigraphical range:** Bitola (Upper Pontian - Lower Dacian).**Collection:** unknown

THUJA L. - CUPRESSACEAE

*Thuja sp.*Djordjevič Milutinović, *in collect*.**Material:** Lf**Location and stratigraphical range:** Čiflik, Ljuboš, Ljubočka River (Miocene).**Collection:** NHMBEO

TORREYA Arn. - TAXACEAE

Torreya sp.

2004. Mihajlovič & Lazarevič, p. 286, Pl. 1, Fig. 6.

Material: Lf**Location and stratigraphical range:** Bitola (Upper Pontian - Lower Dacian).**Collection:** unknown

TSUGA Carrière - PINACEAE

Tsuga europaea Menzel

1913. Menzel, p. 22.

1956. *Tsuga cf. canadensis* Murr.; Pantich & Nikolich, p. 82, Pl. 2, Fig. 1.**Material:** Lf**Location and stratigraphical range:** Oslomej (Dacian).**Collection:** unknown*Tsuga cf. canadensis* Murr.

1956. Pantich & Nikolich, p. 82, Pl. 2, Fig. 1.

Rev. *Tsuga europaea* Menzel; Bozukov hoc. loco.

IV. Divisio MAGNOLIOPHYTA

1. Class MAGNOLIOPSIDA

A

ACER L. – SAPINDACEAE

Acer palaeosaccharinum Stur

1867. *Acer palaeosaccharinum* Stur, p. 177, Pl. 5, Fig. 10.

2004. Mihajlović & Lazarević, p. 286, Pl. 1, Fig. 1.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

Acer platanoides L. foss.

1930. Černjavski, p. 251, Text-fig. 2: 7.

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Matka and Berovo, Monastery Matka (sub-recent).

Collection: NHMBEO (Matka and Berovo); unknown (Monastery Matka).

Acer aff. platanoides L.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Roždan (sub-recent).

Collection: NHMBEO

Acer pseudomonspessulanum Unger

1847. *Acer pseudomonspessulanum* Unger, p. 132, Pl. 43, Figs 1-2.

2004. Mihajlović & Lazarević, p. 286, Pl. 5, Fig. 9.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

Acer pseudoplatanus L. foss.

1930. Černjavski, p. 251, p. 257, Text-fig. 2: 4; Text-fig. 4: 4.

1956. *A. pseudoplatanus* L., Pantich & Nikolich, p. 87, Pl. 4, Figs 4-5.

1996. *Hedera helix* L. Foss., Kitanov, p. 65, Pl. 3, Fig. 3.

1996. Kitanov, p. 65, Pl. 2, Fig. 4; Pl. 3, Fig. 1.

Černjavski, *in collect.*

Material: Ds, Lf

Location and stratigraphical range: Živojno (Upper Pliocene); Monastery Matka, Matka and Berovo, Valandovo (sub-recent).

Collection: IBER (Živojno); NHMBEO (Matka and Berovo, Živojno); unknown (Monastery Matka, Valandovo).

Acer tataricum L. foss.

1930. Černjavski, p. 251, Text-fig. 2: 5.

1996. Kitanov, p. 65, Pl. 3, Fig. 3.

Material: Ds, Lf

Location and stratigraphical range: Živojno (Upper Pliocene); Monastery Matka (sub-recent).

Collection: IBER (Živojno); unknown (Monastery Matka).

Acer tricuspdatum A. Braun et Agass. in Bronn

1838. *Acer tricuspdatum* A. Braun et Agass. in Bronn, p. 865, Pl. 35, Figs 10a-b.

1922. *Acer trilobatum* A. Braun; Pax, p. 313.

1955a. Milaković, p. 151, Pl. 2, Fig. 7.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Miocene); Skopje - Vardar River (Miocene); Katlanovo (Lower Pliocene).

Collection: NHMBEO (Skopje - Vardar River; Katlanovo).

Acer tricuspdatum A. Braun et Agass. in Bronn

2017. Stojanova, Petrov & Stefanova, p. 98, Fig. 2:1.

Rev.: *Vitis sylvestris* Gmel. foss.; Bozukov, *hoc loco*.

***Acer cf. tricuspdatum* A. Braun in Bronn**

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Acer trilobatum* A. Braun**

1922. Pax, p. 113.

1955a. Milaković, p. 151, Pl. 2, Fig. 7.

Rev. *Acer tricuspdatum* A. Braun in Bronn; Bozukov, *hoc loco*.

Acer sp. (cf. pseudoplatanus L.)

1956. Pantich, p. 237.

Material: Lf

Location and stratigraphical range: Pulevec (Pliocene).

Collection: unknown

Acer sp. 1

1956. Pantich, p. 238.

Material: Lf

Location and stratigraphical range: Pulevec (Pliocene).

Collection: unknown

Acer sp. 2

1993. Kitanov, p. 68, Pl. 5, Figs 1-3.

Material: Ds

Location and stratigraphical range: Lukovo (Lower Pliocene).

Collection: IBER

Acer sp. 3

1979. Pantich, Dumurtzanov & Pavlovski, p. 28.

Material: Ds

Location and stratigraphical range: Carina, Leskovec (Upper Pliocene).

Collection: unknown

Acer sp. 4

1979. Pax, p. 313.

Material: Ds, Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

Acer sp. 5

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Acer sp. 6

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Acer sp. 7

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Roždan (sub-recent).

Collection: NHMBEO

Acer sp. 8

Černjavski, *in collect*.

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

Acer sp. 9

Černjavski, *in collect*.

Material: Ds

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

Acer sp. 10

2004. Mihajlović & Lazarević, p. 286, Pl. 5, Fig. 11.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

AILANTHUS Desf. – SIMAROUBACEAE

Ailanthus dryandroides Heer

1859. *Ailanthus dryandroides* Heer, p. 87, Pl. 127, Figs 31-32; Pl. 154, Fig. 35.

1922. Pax p. 312.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

ALNITES Göpp. – BETULACEAE

Alnites reussii Ett.

1853. Ettingshausen, p. 39, Pl. 31, Figs 13-17.

1994. Mihajlović & Ljubotenski, p. 207, Pl. 2, Figs 20-21.

Material: Lf

Location and stratigraphical range: Nemanjica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

ALNUS Miller – BETULACEAE

Alnus cercopiaefolia (Ett.) Berger

1951. *Artocarpidium cercopiaefolium* Ettingshausen, p. 15, Pl. 2, Figs 3-4.

1955. *Alnus cercopiaefolia* (Ett.) Berger, p. 87, Fig.-text 30.

2004. Mihajlović & Lazarević, p. 286, Pl. 4, Fig. 1, 6-7.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian); Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO (Skopje); unknown (Bitla).

Alnus ducalis (Gaudin) Knobloch

1858. *Rhamnus ducalis* Gaudin in Gaudin & Strozzi, p. 39, Pl. 9, Figs 6-9.

1969. *Alnus ducalis* (Gaudin) Knobloch, p. 69, Pl. 28, Figs 1-3; Pl. 29, Figs 1-5; Pl. 31, Figs 1-2; Pl. 32, Fig. 5; Pl. 33, Figs 4-5; Pl. 34, Figs 1-2; Pl. 35, Fig. 5; Pl. 53, Fig. 9; Pl. 75, Fig. 4; Figs-text 159-166.

1993. Kitanov, p. 63, Pl. 1, Fig. 5.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Lukovo (Lower Pliocene).

Collection: IBER (Lukovo); NHMBEO (Skopje).

Alnus gaudinii (Heer) Knobloch & Kvaček

1859. *Rhamnus gaudinii* Heer, p. 79, Pl. 124, Figs 4-15; Pl. 125, Figs 1, 7, 13.

1976. *Alnus gaudinii* (Heer) Knobloch & Kvaček, p. 33, Pl. 6, Figs 1, 3; Pl. 7, Figs 1, 5; Pl. 13, Fig. 4; Pl. 15, Figs 1-4, 7-8, 11, 13, 15, 17; Pl. 16, Figs 1-5; Pl. 19, Fig. 15; Pl. 20, Fig. 10; Figs-text 11-12.

2021. Bozukov et al., p. 13.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Skopje (Pliocene); Suvodol (Pliocene).

Collection: MNHRNM (Suvodol); NHMBEO (Skopje).

Alnus glutinosa (L.) Gaertn.

1930. Černjavski, p. 257.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Roždan, Valandovo (sub-recent).

Collection: NHMBEO (Roždan); unknown

(Valandovo).

***Alnus aff. glutinosa* Gaertn.**

2021. Bozukov et al., p. 13.

Material: Lf

Location and stratigraphical range: Suvodol (Pliocene).

Collection: MNHRNM

***Alnus glutinosa* Gaertn. foss.**

1956. *Alnus kefersteinii* (Göpp.) Unger; Pantich & Nikolich, p. 82, Pl. 2, Fig. 5; p. 86, Pl. 3, Figs 1-2; Pl. 4, fig. 1.

1996. *Alnus glutinosa* Gaertn. foss.; Kitanov, p. 62, Pl. 1, Fig. 5.

Material: Lf

Location and stratigraphical range: Oslomej, (Dacian); Živojno (Upper Pliocene).

Collection: IBER (Živojno)

***Alnus kefersteinii* (Göpp.) Unger s. str.**

1836. *Alnites kefersteinii* Göppert, p. 565, Pl. 41, Figs 15-18.

1847. *Alnus kefersteinii* (Göpp.) Unger, p. 115 p. p. quad strobili, Pl. 33, Figs 1-2.

1956. Pantich & Nikolich, p. 82; p. 86, Pl. 3, Fig. 3.

Černjavski, *in collect.*

Djordjević Milutinović, *in collect.*

Material: Ds

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Oslomej (Dacian); Živojno (Upper Pliocene).

Collection: NHMBEO (Skopje, Živojno); unknown (Oslomej).

***Alnus kefersteinii* (Göpp.) Unger**

1956. *Alnus kefersteinii* (Göpp.) Unger; Pantich & Nikolich, p. 82, Pl. 2, Fig. 5; p. 86, Pl. 3, Figs 1-2; Pl. 4, fig. 1.

Rev. *Alnus glutinosa* Gaertn. foss.; Bozukov, *hoc loco*.

Alnus sp. 1

1956. Pantich & Nikolich, p. 83.

Material: Lf

Location and stratigraphical range: Oslomej (Dacian).

Collection: unknown

Alnus sp. 2

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Alnus sp. 3

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Pliocene).

Collection: NHMBEO

Alnus sp. 4

Djordjević Milutinović, *in collect.*

Material: Ds

Location and stratigraphical range: Skopje (Pliocene).

Collection: NHMBEO

Alnus sp. 5

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

AMPELOPSIS Michx. – VITACEAE

***Ampelopsis hibschii* Bůžek, Kvaček & Walther**

1876. *Populus mutabilis* Heer; Engelhardt, p. 381, Pl. 19, Fig. 14.

1981. *Ampelopsis hibschii* Bůžek, Kvaček & Walther, p. 127, Pl. 1-6; Figs-text 1-7.

2021. Bozukov et al., p. 13.

Material: Lf

Location and stratigraphical range: Suvodol (Pliocene).

Collection: MNHRNM

ANDROMEDA L. – ERICACEAE

Andromeda protogaea Unger

1955a. Milaković, p. 153, Pl. 2, Fig. 6.

Rev. *Dicotylophyllum* indet.; Bozukov *hoc loco*.

1955b. Milaković, p. 110, Pl. 2, Fig. 6.

Rev. 1994. *Dicotylophyllum* indet.; Mihajlovič & Ljubotenski, p. 204.

APOCYNOPHYLLUM Unger – APOCYNACEAE

Apocynophyllum carissa Unger

1866. *Apocynophyllum carissa* Unger, p. 13, Pl. 4, Fig. 12.

1954. Pantich, p. 168,

Material: Lf

Location and stratigraphical range: Ramadanica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

B

BANKSIA L. f. – PROTEACEAE

"Banksia" haeringiana (Ung.) Ett.

1850a. *Myrica haeringiana* Unger, p. 359.

1851b. *Banksia haeringiana* (Ung.) Ettingshausen, p. 23, Pl. 2, Figs 17-18.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Note: The systematic affinity to fam. Proteaceae is questionable.

"Banksia" helvetica Heer

1856. *Banksia helvetica* Heer, p. 98, Pl. 97, Figs 44-48; Pl. 98, Fig. 16.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Carevo selo/ Delčevo (Eocene).

Collection: NHMBEO

Note: The systematic affinity to fam. Proteaceae is questionable.

"Banksia" longifolia Ett.

1853. *Banksia longifolia* Ettingshausen, p. 99, Pl. 99, Figs 1-3.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Carevo selo/ Delčevo (Eocene); Skopje (Oligocene); Skopje - Vardar River (Miocene).

Collection: NHMBEO

Note: The systematic affinity to fam. Proteaceae is questionable.

"Banksia" sp. vel Quercus drymeja

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Note: The systematic affinity to fam. Proteaceae is questionable.

"Banksia" sp.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Note: The systematic affinity to fam. Proteaceae is questionable.

BANKSITES Sap. – PROTEACEAE

"Banksites" integer Sap.

1861. *Banksites integer* Saporta in Heer, p. 138.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Note: The systematic affinity to fam. Proteaceae is questionable.

BERBERIS L. – BERBERIDACEAE

***Berberis berberidifolia* (Heer) Palam. & Petk.**

1859. *Ilex berberidifolia* Heer, p. 72, Pl. 122, Figs 12-18.

1922. Pax, p. 312.

1987. *Berberis berberidifolia* (Heer) Palamarev & Petkova, p. 47, Pl. 14, Fig. 7.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

BERCHEMIA Neckar ex DC. – RHAMNACEAE

***Berchemia* sp.**

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

BETULA L. – BETULACEAE

***Betula pendula* Roth foss.**

1930. *Betula verucosa* Ehrh., Černjavski, p. 251, Text-fig. 1: 2.

Material: Lf

Location and stratigraphical range: Monastery Mat-

ka (sub-recent).

Collection: unknown

***Betula prisca* Ett.**

1851. *Betula prisca* Ettingshausen, p. 11, Pl. 1, Figs 15-17.

1979. Pantich, Dumurtzanov & Pavlovski, p. 27.

Material: Lf

Location and stratigraphical range: Carina, Leskovec (Upper Pliocene).

Collection: unknown

***Betula subpubescens* Göpp.**

1855. *Betula subpubescens* Göppert, p. 11, Pl. 3, Fig. 9.

2021. Bozukov, p. 13.

Material: Lf

Location and stratigraphical range: Suvodol (Pliocene).

Collection: MNHRNM

***Betula verrucosa* Ehrh.**

1930. Černjavski, p. 251, Text-fig. 1: 2.

Rev. *Betula pendula* Roth foss.; Bozukov *hoc loco*.

BUMELIA Swartz – SAPOTACEAE

***Bumelia* aff. *lanuginosa* (Michx.) Pers.**

2021. Bozukov et al., p.13.

Material: Lf

Location and stratigraphical range: Vitolište (Pliocene).

Collection: MNHRNM

***Bumelia* sp.**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Sopište (Oligocene).

Collection: NHMBEO

C

CALLITRICHE L. – PLANTAGINACEAE

Callitriche aff. cophocarpa Sendtn.

2021. Bozukov et al., p.13, Fig. 6.

Material: Lf

Location and stratigraphical range: Sudik (Upper Eocene).

Collection: MNHRNM

CARPINUS L. – BETULACEAE

Carpinus betulus L. foss. (*C. grandis* Ung.)

1955a. *Carpinus grandis* Unger; Milaković, p. 149, Pl.1, Figs 5-7.

1948. Černjavski, p. 52, Pl. 2, Fig. 2.

1956. Pantich & Nikolich, p. 86, Pl. 3, Fig. 4.

1979. Pantich, Dumurtzanov & Pavlovski, p. 27.

1993. *Carpinus betulus* L. foss. (*C. grandis* Ung.); Kitanov, p. 63, Pl. 2, Figs 1-4.

1996. *Carpinus betulus* L. foss.; Kitanov, p. 64, Pl. 3, Fig. 2.

Djordjević Milutinović, *in collect.*

Material: Ds, Lf

Location and stratigraphical range: Skopje (Pliocene); Katlanovo, Lukovo (Lower Pliocene); Carina, Leskovec, Vranjevci, Živojno (Upper Pliocene).

Collection: IBER (Lukovo, Živojno), NHMBEO (Katlanovo, Skopje, Živojno).

Carpinus grandis Unger

1852. *Carpinus grandis* Unger; p. 39, Pl. 20, Figs 4-5.

1922. Pax, p. 307.

Djordjević Milutinović, *in collect.*

Material: Ds, Lf

Location and stratigraphical range: Skopje (Miocene); Skopje - Vardar River (Miocene); Katlanovo (Lower Pliocene).

Collection: NHMBEO (Katlanovo, Skopje - Vardar River); unknown (Skopje).

Carpinus grandis Unger

1955a. Milaković, p. 149, Pl.1, Figs 5-7.

1956. Pantich & Nikolich, p. 86, Pl. 3, Fig. 4.

Rev. 1993. *Carpinus betulus* L. foss.; Kitanov, p. 63, Pl. 2, Fig. 5.

1948. Černjavski, p. 52, Pl. 2, Fig. 2.

1979. Pantich, Dumurtzanov & Pavlovski, p. 27.

Rev. *Carpinus betulus* L. foss.; Bozukov, *hoc loco.*

Carpinus sp.

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

CARYA Nutt. – JUGLANDACEAE

Carya denticulata (Web.) Schimp.

1874. *Carya denticulata* (Web.) Schimper, p. 255.

1852. *Juglans denticulata* Weber, p. 211, Pl. 23, Fig. 10a, b.

1956. *Pterocarya* cf. *denticulata* (Web.) Heer; Pantich & Nikolich, p. 84, Pl. 2, Fig. 7.

1956. *Pterocarya denticulata* (Web.) Heer; Pantich & Nikolich, p. 87, Pl. 4, Fig. 2.

1979. *Carya serraefolia* (Göpp.) Kräusel; Pantich, Dumurtzanov & Pavlovski, p. 28.

Material: Lf

Location and stratigraphical range: Oslomej (Dacian); Carina, Leskovec, Živojno (Upper Pliocene).

Collection: unknown

Carya elaeonides (Ung.) Heer

1850b. *Juglans elaeonides* Unger, p. 179, Pl. 32, Figs 1-4.

1859. *Carya elaeonides* (Ung.) Heer; p. 92, Pl. 131, Figs 1-4.

1922. Pax, p. 306.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

Carya serraefolia (Göpp.) Kräusel

1979. Pantich, Dumurtzanov & Pavlovski, p. 28.

Rev. 1987. *Carya denticulata* (Web.) Schimp.; Palamarev & Petkova, p. 87, Pl. 23, Figs 2, 4-5.

Carya sp.

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

CASSIA L. – FABACEAE

Cassia lignitum Unger

1850a. *Cassia lignitum* Unger, p. 492.

1922. Pax, p. 311.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

Cassia phaseolites Unger

1850b. *Cassia phaseolites* Unger, p. 58, Pl. 44, Figs 1-5, Pl. 45, Figs 1-9.

1922. Pax, p. 311.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

Cassia zephyri Ett.

1853. *Cassia zephyri* Ettingshausen, p. 90, Pl. 30, Figs 1-8.

1922. Pax, p. 311.

Material: Lf

Location and stratigraphical range: Skopje

(Miocene).

Collection: unknown

CASTANEA Mill. – FAGACEAE

Castanea atavia Unger

1922. Pax, p. 308.

1956. Pantich, p. 236, Pl. 1, Fig. 2.

1979. Pantich, Dumurtzanov & Pavlovski, p. 28.

Rev. 1987. *Castanea sativa* Mill. foss.; Palamarev & Petkova, p. 64, Pl. 16, Figs 6-8.

Castanea sativa Mill. foss.

1922. *Castanea atavia* Unger; Pax, p. 308.

1956. Pantich, p. 236, Pl. 1, Fig. 2.

1979. Pantich, Dumurtzanov & Pavlovski, p. 27.

2021. *Castanea sativa* Mill. foss.; Bozukov et al., p. 13.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Miocene); Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Skopje (Pliocene); Pulevec, Suvodol (Pliocene); Carina, Leskovec (Upper Pliocene).

Collection: MNHRNM (Suvodol); NHMBEO (Skopje); unknown (Carina, Leskovec, Pulevec); unknown (Skopje Miocene).

CELASTRUS L. – CELASTRACEAE

Celastrus elaeus Ung.

1850a. *Celastrus elaeus* Unger, p. 459.

1967. Pax, p. 312.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

Celastrus sp.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Sudik (Upper Eocene).

Collection: MNHRNM

CERCIDIPHYLLUM Siebold & Zucc. –
CERCIDIPHYLLACEAE

***Cercidiphyllum crenatum* (Unger) R. Brown**

1850a. *Dombeyopsis crenata* Unger, p. 448.

1935. *Cercidiphyllum crenatum* (Unger) R. Brown, p. 575, Pl. 68, Figs 1, 6, 9-10 (non Fig. 6a).

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bu-
lačani and Kučkovo village (Paleogene).

Collection: NHMBEO

CINNAMOMUM Blume – LAURACEAE

***Cinnamomum buchii* Heer**

1856. *Cinnamomum buchii* Heer, p. 90, Pl. 95, Figs 1-8.

1922. Pax, p. 309.

Material: Lf

Location and stratigraphical range: Skopje
(Miocene).

Collection: unknown

***Cinnamomum lanceolatum* (Unger) Heer**

1955b. Milaković, p. 109, Pl. 1, Figs 3-6.

Rev. 1994. *Daphnogene lanceolata* Unger; Mihajlovič & Ljubotenski, p. 204.

***Cinnamomum polymorphum* (A. Braun) Heer**

1922. Pax, p. 309.

Rev. *Daphnogene cinnamomea* (Rossm.) Knobloch; Bozukov, *hoc loco*.

1954. Pantich, p. 167, Pl. 60, Fig. 6.

Rev. 1994. *Daphnogene cinnamomea* (Rossm.)

Knobloch; Mihajlovič & Ljubotenski, p. 204, Pl. 1, Figs 2, 10.

***Cinnamomum scheuchzeri* Heer**

1922. Pax, p. 309.

Rev. *Daphnogene cinnamomea* (Rossm.) Knobloch; Bozukov *hoc loco*.

1955b. Milaković, p. 109, Pl. 1, Fig. 2.

Rev. 1994. *Daphnogene cinnamomea* (Rossm.) Knobloch; Mihajlovič & Ljubotenski, p. 204, Pl. 1, Figs 2, 10.

***Cinnamomum spectabile* Heer**

1922. Pax, p. 309.

Rev. *Daphnogene spectabilis* (Heer) Knobloch; Bozukov, *hoc loco*.

***Cinnamomum* sp.**

1954. Pantich, p. 168, Pl. 60, Fig. 5.

Rev. 1994. *Daphnogene cinnamomea* (Rossm.) Knobloch; Mihajlovič & Ljubotenski, p. 204, Pl. 1, Figs 2, 10.

1955b. Milaković, p. 110, Pl. 2, Figs 1-3.

Rev. 1994. *Dicotylophyllum* indet.; Mihajlovič & Ljubotenski, p. 204.

***Cinnamomum subrotundum* (A. Braun) Heer**

1845. *Ceanothus subrotundus* A. Braun, p. 172.

1856. *Cinnamomum subrotundum* (A. Braun) Heer, p. 87, Pl. 91, Fig. 9d; Pl. 92, Fig. 5a; Pl. 93, Figs 18-24.

1922. Pax, p. 310.

Material: Lf

Location and stratigraphical range: Skopje
(Miocene).

Collection: unknown

CLEMATIS L. – RANUNCULACEAE

***Clematis* aff. *flammula* L.**

1930. Černjavski, p. 251.

Material: Lf

Location and stratigraphical range: Monastery Matka (sub-recent).

Collection: unknown

COMPTONIA L'Hér. – MYRICACEAE

Comptonia acutiloba Brongn.

1988. Milovanović & Mihajlović, p. 335.

Rev. *Comptonia difformis* (Sternb.) Berry; Bozukov, *hoc loco*.

Comptonia difformis (Sternb.) Berry

1821. *Asplenium difforme* Sternberg, p. 33, Pl. 24, Fig. 1.

1906. *Comptonia difformis* (Sternb.) Berry, p. 495.

1988. *Comptonia acutiloba* Brongn.; Milovanović & Mihajlović, p. 335.

2021. *Comptonia difformis* (Sternb.) Berry; Bozukov et al., p. 14.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene); Skopje (Oligocene); Skopje - Kisela Voda/Nerezi Village (Oligocene); Suvodol (Pliocene).

Collection: MNHRNM (Suvodol); NHMBEO (Skopje)

Comptonia schrankii (Sternb.) Berry

1822. *Aspleniopteris schrankii* Sternberg, p. 2, Pl. 21.2.

1906. *Comptonia schrankii* (Sternb.) Berry, p. 514.

1994. Mihajlović & Ljubotenski, p. 207.

Material: Lf

Location and stratigraphical range: Ramadanica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

Comptonia sp.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

CORNUS L. – CORNACEAE

Cornus sanguinea L. foss.

Černjavski, *in collect*.

Material: Lf

Location and stratigraphical range: Matka and Berovo (sub-recent).

Collection: NHMBEO

Cornus sp. 1

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Cornus sp. 2

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene).

Collection: NHMBEO

CORYLUS L. – BETULACEAE

Corylus sp.

Černjavski, *in collect*.

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

D

DALBERGIA L. – FABACEAE

Dalbergia haeringiana Ett.

1853. *Dalbergia haeringiana* Ettingshausen, p. 87, Pl. 29, Figs 7-9.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje – Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

DAPHNOGENE Ung. – LAURACEAE

***Daphnogene bilinica* (Ung.) Kvaček & Knobloch**

1847. *Ceanothus bilinicus* Unger, p. 145, Pl. 49, Fig. 9.

1967. *Daphnogene bilinica* (Unger) Kvaček & Knobloch, p. 203.

2021. Bozukov et al., p. 14.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Babin Dol (Paleogene); Sudik (Upper Eocene); Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Suvodol (Pliocene).

Collection: MNHRNM (Sudik, Suvodol); NHMBEO (Babin Dol, Skopje).

***Daphnogene cinnamomea* (Rossm.) Knobloch**

1840. *Phyllites cinnamomeus* Rossmässler, p. 23, Pl. 1, Figs 1-8.

1922. *Cinnamomum polymorphum* (A. Braun) Heer; Pax, p. 309.

1954. Pantich, p. 167, Pl. 60, Fig. 6.

1954. *Cinnamomum* sp.; Pantich, p. 168, Pl. 60, Fig. 5.

1968. *Daphnogene cinnamomea* (Rossm.) Knobloch, p. 139, Pl. 2, Fig. 6, Pl. 4, Fig. 2.

1994. Mihajlovič & Ljubotenski, p. 204, Pl. 1, Figs 2, 10; Pl. 2, Fig. 5.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Nemanjica, Krivi Do, Sudik – Ovče Polje Basin (Upper Eocene); Skopje (Miocene); Oslomej (Pliocene).

Collection: MNHRNM (Sudik, Oslomej); NHMBEO (Krivi Do); unknown (Skopje).

***Daphnogene lanceolata* Unger**

1850a. *Daphnogene lanceolata* Unger, p. 167, Pl. 37, Figs 1-7.

1955b. *Cinnamomum lanceolatum* (Unger) Heer,

Milaković, p. 109, Pl. 1, Figs 3-6.

1988. *Daphnogene lanceolata* Unger, Milovanović & Mihajlovič, p. 335, Pl. 1, Fig. 7.

1994. Mihajlovič & Ljubotenski, p. 204.

2021. Bozukov et al., p. 14.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Krivi Do – Ovče Polje Basin (Upper Eocene); Skopje - Kisela Voda mine/Nerezi Village, Kočane (Oligocene); Vitolište (Pliocene).

Collection: MNHRNM (Vitolište); NHMBEO (Krivi Do, Skopje); unknown (Kočane).

***Daphnogene polymorpha* (A. Braun) Ett.**

1845. *Ceanothus polymorpha* A. Braun, p. 171.

1851. *Daphnogene polymorpha* (A. Braun) Etinghausen, p. 16, Pl. 2, Figs 23-25.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo Village (Paleogene); Skopje - Kisela Voda mine/Nerezi Village (Oligocene); Skopje (Middle Miocene); Skopje - Vardar River (Miocene); Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Daphnogene spectabile* (Heer) Knobloch**

1856. *Cinnamomum spectabile* Heer, p. 91, Pl. 96, Figs 1-8.

1922. Pax, p. 309.

1968. *Daphnogene spectabile* (Heer) Knobloch, p. 139, Pl. 4, Fig. 3; Pl. 5, Fig. 9.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

***Daphnogene* sp. 1**

1988. Milovanović & Mihajlovič, p. 335.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

Daphnogene sp. 2

1994. Mihajlovič & Ljubotenski, p. 207.

Material: Lf

Location and stratigraphical range: Nemanjica, Ramadanica – Ovče Polje Basin (Upper Eocene);

Collection: unknown

Daphnogene sp. 3

2004. Mihajlovič & Lazarevič, p. 286, Pl. 1, Fig. 9.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

Daphnogene sp. 4

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Daphnogene sp. 5

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

Daphnogene sp. 6

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Middle Miocene).

Collection: NHMBEO

DRYOPHYLLUM Debey – FAGACEAE

***Dryophyllum album* Rüffle, Müller-Stoll et Litke**

1994. *Dryophyllum* cf. *album* Rüffle, Müller-Stoll et Litke; Mihajlovič & Ljubotenski, p. 204, Pl. 1, Fig. 1.

Rev. 1998. *Dryophyllum intermedium* (Friedrich) Palamarev et Mai, p. 241, Pl. 6, Figs 3-4; Pl. 11, Figs 1-4.

***Dryophyllum intermedium* (Friedrich) Palam. & Mai**

1883. *Quercus intermedia* Friedrich, p. 222, Pl. 29, Figs 2-5.

1994. *Dryophyllum* cf. *album* Rüffle, Müller-Stoll et Litke; Mihajlovič & Ljubotenski, p. 204, Pl. 1, Fig. 1.

1998. *Dryophyllum intermedium* (Friedrich) Palamarev et Mai, p. 241, Pl. 6, Figs 3-4; Pl. 11, Figs 1-4.

Material: Lf

Location and stratigraphical range: Nemanjica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

***Dryophyllum* sp.**

1954. Pantič, p. 166, Pl. 60, Fig. 3.

Rev. 1994. *Eotrigonobalanus furcinervis* (Rossm.) Walther & Kvaček; Mihajlovič & Ljubotenski, p. 204.

E

ECHITONIUM Unger – APOCYNACEAE

***Echitonium sophiae* Weber**

1988. Milovanović & Mihajlovič, p. 335, Pl. 1, Fig. 6.

Rev. 1994. *Thevetia sophiae* (Weber) Palamarev & Petkova, p. 41, Pl. 1, Fig. 5; Pl. 2; Figs 1-2, 4.

ENGELHARDIA Lesch. ex Blume - JUGLANDACEAE

***Engelhardia orsbergensis* (Wessel & Weber) Jähnichen, Mai et Walther**

1856. *Banksia orsbergensis* Wessel & Weber, p. 146, Pl. 25, Fig. 9a.

1977. *Engelhardia orsbergensis* (Wessel & Weber) Jähnichen, Mai & Walther, p. 326, Pl. 38, Figs 1-4; Pl. 39, Figs 1-7; Pl. 40, Figs 1-6; Pl. 41, Figs 1-6; Pl. 42, Figs 1-7; Pl. 43, Figs 1-4; Pl. 44, Figs 1-7; Pl. 45, Figs 1-7; Pl.

46, Figs 1-7; Pl. 47, Figs 1-6; Pl. 48, Figs 1-4; Pl. 49, Figs 1, 5.

2004. Mihajlović & Lazarević, p. 286, Pl. 5, Figs 2-3.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

EOTRIGONOBALANUS Walther et Kvaček – FAGACEAE

***Eotrigonobalanus cf. furcinervis* (Rossm.) Walther & Kvaček**

1994. ? *Eotrigonobalanus furcinervis* (Rossm.) Walther & Kvaček; Mihajlović & Ljubotenski, p. 207.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Nemanjica, Sudik, Ramadanica – Ovče Polje Basin (Upper Eocene).

Collection: NMHRNM (Sudik)

***Eotrigonobalanus furcinervis* (Rossm.) Walther & Kvaček**

1840. *Phyllites furcinervis* Rossmässler, p. 33, Pl. 6, Fig. 25; Pl. 7, Fig. 26-31.

1954. *Laurus princeps* Heer; Pantič, p. 167.

1954. *Dryophyllum* sp.; Pantič, p. 166, Pl. 60, Fig. 3.

1955b. *Rhamnus cf. roeslerii* Ett.; Milaković, p. 110, Pl. 2, Fig. 4.

1989. *Eotrigonobalanus furcinervis* (Rossm.) Walther et Kvaček in Kvaček & Walther, p. 581, pars, Pl. 33, Figs 1-6; Pl. 34, Figs 1-6; Pl. 35, Figs 1-7; Pl. 36, Figs 1-4; Pl. 39, Figs 1-4; Pl. 40, Figs 1-6; Pl. 41, Figs 1-4; Pl. 42, Figs 1-4; Pl. 43, Figs 1-6; Pl. 44, Figs 1-4; Pl. 45, Figs 1-4; Pl. 46, Figs 1-4 (non Pl. 47, Figs 1-3 = *Quercus lyellii* Heer).

1994. Mihajlović & Ljubotenski, p. 204, Pl. 1, Figs 3, 7-9, 11; Pl. 2, Figs. 3-4, 6-11, 13-18.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Krivi Do, Nemanjica, Sudik – Ovče Polje Basin (Upper Eocene); Su-

vodol (Pliocene).

Collection: NHMBEO (Krivi Do); MNHRNM (Suvodol); unknown (Nemanjica, Sudik).

EUCALYPTUS L'Hér. – MYRTACEAE

***Eucalyptus* "oceanica" Ung.**

1850b. *Eucalyptus oceanica* Unger, p. 52, Pl. 36, Figs 1-13.

1954. Pantič, p. 168.

1955b. Milaković, p. 110, Pl. 2, Fig. 5.

1994. Mihajlović & Ljubotenski, p. 204.

2021. Bozukov et al., p. 14.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Babin Dol (Paleogene); Krivi Do, Nemanjica, Ramadanica, Sudik – Ovče Polje Basin (Upper Eocene); Vitolište (Pliocene).

Collection: MNHRNM (Sudik, Vitolište); NHMBEO (Babin Dol; Krivi Do).

EUGENIA L. – MYRTACEAE

***Eugenia haeringiana* Ung.**

1850b. Unger, p. 52, Pl. 35, Fig. 19.

1988. Milovanović & Mihajlović, p. 335, Pl. 2, Fig. 11.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

EUONYMUS L. – CELASTRACEAE

***Euonymus aff. europaeus* L.**

1930. Černjavski, p. 251.

Material: Lf

Location and stratigraphical range: Monastery Matka (sub-recent).

Collection: unknown

***Euonymus aff. japonicus* Thunb.**

2004. *Dicotylophyllum* indet.; Mihajlović & Lazarević, Pl. 3, Fig. 5.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

***Euonymus* ?**

1930. Černjavski, p. 257.

Material: Lf

Location and stratigraphical range: Valandovo (sub-recent).

Collection: unknown

F

FAGUS L. – FAGACEAE

***Fagus attenuata* Göpp.**

1855. *Fagus attenuata* Göppert, p. 18, Pl. 5, Fig. 8.

1922. Pax, p. 308.

2004. Mihajlović & Lazarević, p. 286, Pl. 2, Fig. 2, 4-5.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene); Skopje (Miocene); Bitola (Upper Pontian - Lower Dacian).

Collection: NHMBEO (Skopje - Bulačani and Kučkovo village); unknown (Bitola, Skopje).

***Fagus gussonii* Massal.**

1859. *Fagus gussonii* Massalongo in Massalongo & Scarbelli, p. 202, Pl. 25, Fig. 2, 5.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Oslomej, Svodol, Vitolište (Pliocene).

Collection: MNHRNM

***Fagus orientalis* Lipsky foss.**

1993. Kitanov, p. 64, Pl. 3, Figs 1-4.

Material: Lf

Location and stratigraphical range: Lukovo (Lower Pliocene).

Collection: IBER

***Fagus pliocenica* Saporta**

1884. *Fagus pliocenica* Saporta, p. 88, pars, Pl. 6, Fig. 5 (non Figs 1-4, 6 = *Fagus attenuata* Goepp.)

1948. Černjavski, p. 52, Pl. 2, Fig. 2.

1956. Pantich, p. 236.

1956. *Quercus* sp. (cf. *ilex* L.), Pantich, p. 236, Pl. 1, Fig. 5.

1956. Pantich & Nikolich, p. 83, Pl. 2, Fig. 6.

1996. Kitanov, p. 64, Pl. 2, Figs 2-3.

Material: Lf

Location and stratigraphical range: Oslomej – Kičevo Coal Basin (Dacian); Pulevec (Pliocene); Vranjevci, Živojno (Upper Pliocene).

Collection: IBER (Živojno); unknown (Oslomej – Kičevo Coal Basin, Pulevec, Vranjevci).

***Fagus* sp. 1**

1956. Pantich & Nikolich, p. 86.

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: unknown

***Fagus* sp. 2**

1979. Pantich, Dumurtzanov & Pavlovski, p. 28.

Material: Lf

Location and stratigraphical range: Carina, Leskovec (Upper Pliocene).

Collection: unknown

***Fagus* sp. (cf. *pliocenica* Sap.)**

1975. Pantich & Pavlovski, p. 102.

Material: Lf

Location and stratigraphical range: Bukovik (Lower Pliocene).

Collection: unknown

***Fagus sylvatica* L.**

1956. Pantich & Nikolich, p. 83, Pl. 2, Fig. 8.

Material: Lf

Location and stratigraphical range: Osłomej – Kičevo Coal Basin (Dacian).

Collection: unknown

FICUS L. – MORACEAE

***Ficus congener* Pilar**

1883. *Ficus congener* Pilar, p. 7, Pl. 6, Fig. 7; Pl. 7, Fig. 2.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Vitolište (Pliocene).

Collection: MNHRNM

***Ficus cf. pyramidalis* Vuk.**

1870. *Ficus pyramidalis* Vukotinović, p. 201.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene).

Collection: NHMBEO

***Ficus* sp.**

1955b. *Ficus* sp., Milaković, p. 110, Pl. 1, Fig. 1.

Rev. 1994. *Dicotylophyllum* indet.; Mihajlovič & Ljubotenski, p. 204.

***Ficus* sp. vel Lauraceae gen. et sp. indet**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

***Ficus* sp. vel *Rhodomyrtophyllum sinuatum* (Bandulska) Walther**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene); Skopje (Middle Miocene).

Collection: NHMBEO

FRAXINUS L. – OLEACEAE

***Fraxinus* sp. 1**

2021. Bozukov et al., p. 14.

Material: Ds

Location and stratigraphical range: Osłomej (Pliocene).

Collection: MNHRNM

***Fraxinus* sp. 2**

1930. Černjavski, p. 251.

Material: Lf

Location and stratigraphical range: Monastery Matka (sub-recent).

Collection: unknown

G

GLEDITSIA L. – FABACEAE

***Gleditsia lyelliana* (Heer) Hantke**

1959. *Podogonium lyellianum* Heer, p. 117, Pl. 136, Figs 22-52.

1922. Pax, p. 310.

1980. *Gleditsia lyellina* (Heer) Hantke in Gregor & Hantke, p. 167, Pl. 9, Fig. 5.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

H

HAMAMELIS L. – HAMAMELIDACEAE

***Hamamelis macedonica* Pax & K. Hoffm.**

1922. *Hamamelis macedonica* Pax & K. Hoffm.; Pax, p. 310.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

HEDERA L. – ARALIACEAE

***Hedera helix* L.**

1930. Černjavski, p. 251, 257.

Material: Lf

Location and stratigraphical range: Monastery Matka, Valandovo (sub-recent).

Collection: unknown

***Hedera helix* L. foss.**

1996. Kitanov, p. 65, Pl. 3, Fig. 3.

Rev.: *Acer pseudoplatanus* L. foss.; Bozukov, *hoc loco*.

I

ILEX L. – AQUIFOLIACEAE

***Ilex berberidifolia* Heer**

1922. Pax, p. 312.

Rev. 1987. *Berberis berberidifolia* (Heer) Palamarev & Petkova, p. 47, Pl. 14, Fig. 7.

J

JUGLANS L. – JUGLANDACEAE

***Juglans acuminata* A. Braun ex Unger**

1922. Pax, p. 306.

1956. Pantich & Nikolich, p. 87, Pl. 3, Fig. 5.

1979. Pantich, Dumurtzanov & Pavlovski, p. 27.

1996. Kitanov, p. 63, Pl. 3, Fig. 4.

Rev.: *Juglans* aff. *regia* L.; Bozukov, *hoc loco*.

***Juglans bilinica* Unger**

1850a. *Juglans bilinica* Unger, p. 469.

1922. Pax, p. 306.

Material: Lf

Location and stratigraphical range: Skopje (Miocene); Carina, Leskovec, Živojno (Upper Pliocene).

Collection: IBER (Živojno)

***Juglans* aff. *regia* L.**

1922. *Juglans acuminata* A. Braun; Pax, p. 306.

1956. Pantich & Nikolich, p. 87, Pl. 3, Fig. 5.

1979. *Juglans acuminata* A. Braun; Pantich, Dumurtzanov & Pavlovski, p. 28.

1996. Kitanov, p. 63, Pl. 3, Fig. 4.

Černjavski, *in collect*.

Djordjević Milutinović, *in collect*

Material: Lf

Location and stratigraphical range: Skopje (Miocene); Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Carina, Leskovec, Živojno (Upper Pliocene).

Collection: IBER (Živojno); NHMBEO (Živojno); unknown (Skopje, Carina, Leskovec).

***Juglans regia* L.**

1930. Černjavski, p. 251.

Material: Lf

Location and stratigraphical range: Monastery Matka (sub-recent).

Collection: unknown

***Juglans* sp. vel *Cornus* sp**

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

***Juglans* sp. 1**

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

***Juglans* sp. 2**

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Roždan (sub-recent).

Collection: NHMBEO

Juglans sp. 3

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

L

LAUROPHYLLUM Göpp. – LAURACEAE

***Laurophyllum acutimontanum* Mai**

1963. *Laurophyllum acutimontanum* Mai, p. 72, Pl. 8, Figs 7, 9, 12; Pl. 9, Figs 1-4; Fig.-text 11 f-h.

1994. *Laurophyllum* cf. *acutimontanum* Mai, Mihajlovič & Ljubotenski, p. 207.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Nemanjica, Ramadanica, Sudik – Ovče Polje Basin (Upper Eocene).

Collection: MNHRNM (Sudik)

Laurophyllum sp. 1

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Sudik (Upper Eocene).

Collection: MNHRNM

Laurophyllum sp. 2

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Laurophyllum sp. 3

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar

River (Miocene).

Collection: NHMBEO

Laurophyllum sp. 4

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Middle Miocene).

Collection: NHMBEO

Laurophyllum sp. 5

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Laurophyllum sp. 6

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Laurophyllum sp. 7

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene);

Collection: NHMBEO

LAURACEOPHYLLUM Sturm – LAURACEAE

Lauraceophyllum (Litsea) primigenia (Ung.) Givulescu

1850a. *Laurus primigenia* Unger, p. 38, Pl. 40, Figs 1-4.

1973. *Lauraceophyllum (Litsea) primigenia (Ung.) Givulescu*, p. 18, Pl. 4, Fig. 1; Pl. 6, Fig. 20; Pl. 7, Figs 1-13.

2021. Bozukov et al., p. 14.

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bu-lačani and Kučkovo village (Paleogene); Suvodol (Pliocene).

Collection: MNHRNM (Suvodol); NHMBEO (Skopje).

LAURUS L. – LAURACEAE

***Laurus nobilis* L. foss.**

2017. *Olea* aff. *europaea* L. var. *sylvestris* L.; Stojanova, Petrov & Stefanova, p. 98, Fig. 2:3-4.

Material: Lf

Location and stratigraphical range: Nerezi Formation of Mariovo Basin (Upper Miocene).

Collection: unknown

***Laurus princeps* Heer**

1954. Pantič, p. 167, Pl. 60, Fig. 4.

Rev. 1994. *Eotrigonobalanopsis furcinervis* (Rossm.) Walther & Kvaček; Mihajlović & Ljubotenski, p. 204, Pl. 1, Figs 3, 7-9, 11.

***Laurus* sp. 1**

1954. Pantič, p. 167

1994. Mihajlović & Ljubotenski, p. 204.

Material: Lf

Location and stratigraphical range: Nemanjica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

***Laurus* sp. 2**

1975. Pantich & Pavlovski, p. 102.

Material: Lf

Location and stratigraphical range: Bukovik (Lower Pliocene).

Collection: unknown

***“Laurus”* sp.**

1988. Milovanović & Mihajlović, p. 335.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

LEGUMINOSITES Bow. - FABACEAE

***Leguminosites* sp. 1**

1922. Pax, p. 311.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

***Leguminosites* sp. 2**

1922. Pax, p. 312.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

LIQUIDAMBAR L. - ALTINGIACEAE

***Liquidambar europaeum* A. Braun**

1836. *Liquidambar europaea* A. Braun in Buckland, p. 513 (nomen).

1956. Pantich, p. 237, Pl. 2, Figs 1-2).

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Pulevec (Pliocene).

Collection: NHMBEO (Skopje); unknown (Pulevec).

***Liquidambar* sp.**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

M

MAGNOLIA L. – MAGNOLIACEAE

Magnolia dsundzeana (Palib.) Takht.

1937. *Annona dsundzeana* Palibin, p. 51, Pl. 4, Fig. 20.

1963. *Magnolia dsundzeana* (Palib.) Takhtajan, p. 197, Pl. 3, Figs 1-2.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Suvodol (Pliocene).

Collection: MNHRNM

Magnolia cf. inaequalis Sap.

1868. *Magnolia inaequalis* Saporta, p. 395, Pl. 11, Figs 4-7.

1922. Pax, p. 308.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

Magnolia mirabilis Kolak.

1959. *Magnolia mirabilis* Kolakovsky, p. 243, Pl. 14, Figs 1-3.

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Oslomej, Vitolište (Pliocene).

Collection: MNHRNM

Magnolia primigenia Ung.

1861. *Magnolia primigenia* Unger, p. 28, Pl. 11, Figs 5-6.

1922. Pax, p. 308.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

MYRICA L. – MYRICACEAE

Myrica banksiaefolia Unger

1850b. *Myrica banksiaefolia* Unger, p. 30, Pl. 6, Figs 3-4.

2021. Bozukov et al., p.14.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Čiflik, Ljuboš, Ljubočka River (Miocene);

Suvodol, Vitolište (Pliocene).

Collection: MNHRNM (Suvodol, Vitolište); NHMBEO (Čiflik, Ljuboš, Ljubočka River).

Myrica hakeaefolia (Unger) Saporta

1850b. *Dryandroides hakeaefolia* Unger, p. 39, Pl. 20, Figs 7-10.

1856. *Myrica hakeaefolia* (Unger) Saporta, p. 100, Pl. 5, Figs 9A-B.

1922. Pax, p. 306.

1954. Pantich, p. 167.

1994. Mihajlovič & Ljubotenski, p. 204.

Material: Lf

Location and stratigraphical range: Nemanjica – Ovče Polje Basin (Upper Eocene); Skopje (Miocene).

Collection: unknown

Myrica laevigata (Heer) Saporta

1856. *Driandroides laevigata* Heer, p. 101, Pl. 99, Figs 5-8.

1889. *Myrica laevigata* (Heer) Saporta, p. 3, Pl. 1, Fig. 2.

1988. Milovanović & Mihajlovič, p. 335, Pl. 2, Figs 2, 14.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Kočane (Oligocene); Skopje - Kisela Voda mine/Nerezi Village, Skopje (Oligocene).

Collection: NHMBEO (Skopje); unknown (Kočane).

***Myrica lignitum* (Ung.) Saporta**

1847. *Quercus lignitum* Unger, p. 113, Pl. 31, Figs 5-7.

1865. *Myrica lignitum* (Unger) Saporta, p. 102.

1922. Pax, p. 305.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Carevo selo/Delčevo (Eocene); Skopje - Kisela Voda mine/Nerezi Village, Skopje, Sopište (Oligocene); Skopje (Miocene).

Collection: NHMBEO (Carevo selo; Skopje - Oligocene); Sopište; Unknown (Skopje - Miocene)

***Myrica longifolia* Unger**

1850b. *Myrica longifolia* Unger, p. 29, Pl. 6, Fig. 2; Pl. 7, Fig. 1.

1988. Milovanović & Mihajlović, p. 335, Pl. 2, Fig. 3.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

***Myrica oeningensis* (A. Braun) Heer**

1845. *Comptonia oeningensis* A. Braun, p. 76.

1856. *Myrica oeningensis* (A. Braun) Heer, p. 33, Pl. 70, Figs 1-4.

1922. Pax, p. 306.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

Myrica sp. vel Quercus sp.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Myrica sp. 1

1954. Pantič, p. 167.

1994. Mihajlović & Ljubotenski, p. 204.

Material: Lf

Location and stratigraphical range: Ramadanica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

Myrica sp. 2

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Čiflik, Ljuboš, Ljubočka River (Miocene).

Collection: NHMBEO

Myrica sp. 3

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Myrica sp. 4

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Carevo selo/Delčevo (Eocene).

Collection: NHMBEO

Myrica sp. 5

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Middle Miocene).

Collection: NHMBEO

Myrica sp. 6

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Myrica sp. 7

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

Myrica sp. 8

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Sopište (Oligocene).

Collection: NHMBEO

N

NERITINIUM Unger – APOCYNACEAE

***Neritinium longifolium* Ung.**

1866. *Neritinium longifolium* Unger, p. 17, Pl. 5, Fig. 4.

1954. Pantič, p. 168.

1994. Mihajlovič, Ljubotenski, p. 204.

Material: Lf

Location and stratigraphical range: Nemanjica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

Neritinium sp.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Sopište (Oligocene).

Collection: NHMBEO

NERIUM L. – APOCYNACEAE

Nerium sp.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

NYSSA L. – NYSSACEAE

***Nyssa ornithobroma* Unger**

1861. *Nyssa ornithobroma* Unger, p. 16, Pl. 8, Figs 15-18.

2021. Bozukov et al., p.15.

Material: Lf

Location and stratigraphical range: Vitolište (Pliocene).

Collection: MNHRNM

O

OCOTEA Aubl. – LAURACEAE

***Ocotea heeri* (Gaudin) Takht.**

1858. *Oreodaphne heeri* Gaudin in Gaudin & Strozzi, p. 35, Pl. 10, Figs 5-9; Pl. 11, Figs 1-7.

1963. *Ocotea heeri* (Gaudin) Takhtajan, p. 199.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene).

Collection: NHMBEO

OLEA L. – OLEACEAE

***Olea aff. europaea* L. var. *sylvestris* L.**

2017. *Olea aff. europaea* L. var. *sylvestris* L.; Stojanova, Petrov & Stefanova, p. 98, Fig. 2:3-4.

Rev.: *Laurus nobilis* L. foss.; Bozukov, *hoc loco*.

***Olea noti* Unger**

1847. *Olea noti* Unger, p. 62, Pl. 10, Figs 1-12.

1922. Pax, p. 313.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

OREODAPHNE Nees & Mart. – LAURACEAE

Oreodaphne sp.

1988. Milovanović & Mihajlovič, p. 335.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

OSTRYA Scop. – BETULACEAE

Ostrya carpinifolia Scop. foss.

1930. Černjavski, p. 257, Text-fig. 4: 1-2.

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Matka and Berovo, Valandovo (sub-recent).

Collection: NHMBEO (Matka and Berovo); unknown (Valandovo).

Ostrya sp.

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

P

PALAEOLOBIUM Unger – FABACEAE

Palaeolobium heterophyllum Unger

1850a. *Palaeolobium heterophyllum* Unger, p. 55, Pl. 41, Figs 1-5.

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Vitolište (Pliocene).

Collection: MNHRNM

PERSEA Mill. – LAURACEAE

Persea braunii Heer

1856. *Persea braunii* Heer, p. 80, pars, Pl. 89, Figs 9-10 (non Fig. 6-8 = Lauraceae fruct.).

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Oslomej (Pliocene).

Collection: MNHRNM

Persea pliocenica (Laur.) Kolak.

1904. *Persea indica* (L.) Spreng. *pliocenica* Laurent, p. 152, Fig. 26.

1957. *Persea pliocenica* (Laur.) Kolakovsky, p. 276, Pl. 16, Figs 2-3.

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Suvodol, Vitolište (Pliocene).

Collection: MNHRNM

Persea radobojana Ett.

1870. *Persea radobojana* Ettingshausen, p. 877, Pl. 2, Fig. 10.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene).

Collection: NHMBEO

Persea cf. radobojana Ett.

1870. *Persea radobojana* Ettingshausen, p. 877, Pl. 2, Fig. 10.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene); Sopište (Oligocene).

Collection: NHMBEO

Persea sp.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene).

Collection: NHMBEO

PLATANUS L. – PLATANACEAE

Platanus aceroides Göpp.

1855. *Platanus aceroides* Göppert; p. 21, Pl. 9, Figs 1-3.

1955a. Milaković, p. 151, Pl. 3, Figs 1-3.

Material: Lf

Location and stratigraphical range: Katlanovo (Lower Pliocene).

Collection: NHMBEO

Platanus leucophylla (Ung.) Knobl.

1850a. *Populus leucophylla* Unger, p. 417.

1971. *Platanus leucophylla* (Ung.) Knobloch, p. 264.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Platanus orientalis L.

1930. Černjavski, p. 251.

Material: Lf

Location and stratigraphical range: Monastery Matka (sub-recent).

Collection: unknown

PODOGONIUM Heer – FABACEAE

Podogonium lyellianum Heer

1922. Pax, p. 310.

Rev. 1980. *Gleditsia lyelliana* (Heer) Hantke; Gregor & Hantke, p. 167, Pl. 9, Fig. 5.

POPULUS L. – SALICACEAE

Populus alba L. foss.

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Suvodol (Pliocene).

Collection: MNHRNM

Populus balsamoides Göpp.

1855. *Populus balsamoides* Göppert, p. 23, Pl. 15, Figs 3, 6; Pl. 16, Figs 3-5.

1955a. Milaković, p. 149, Pl. 1, Fig. 2.

1956. Pantich, p. 237.

Material: Lf

Location and stratigraphical range: Katlanovo (Lower Pliocene); Pulevec (Pliocene).

Collection: NHMBEO (Katlanovo); unknown (Pulevec).

Populus cf. latior A. Braun

1836. *Populus latior* A. Braun in Buckland, p. 512.

1955a. *Populus cf. latior* A. Braun, Milaković, p. 149, Pl. 1, Figs 3-4.

Material: Lf

Location and stratigraphical range: Katlanovo (Lower Pliocene).

Collection: NHMBEO

Populus nigra L. foss.

2021. Bozukov et al., p. 15.

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Oslomej (Pliocene); Matka and Berovo (sub-recent).

Collection: MNHRNM (Oslomej); NHMBEO (Matka and Berovo).

Populus aff. nigra L.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Roždan (sub-

recent).

Collection: NHMBEO

Populus populina (Brongn.) Knobloch

1822. *Phyllites populina* Brongniart, p. 237, Pl. 14, Fig. 4.

1964. *P. populina* (Brongn.) Knobloch, p. 601.

2004. Mihajlović & Lazarević, p. 286, Pl. 5, Figs 4, 8.

2021. Bozukov et al., p. 15.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Bitola (Upper Pontian - Lower Dacian); Vitolište (Pliocene).

Collection: NHMBEO (Skopje); MNHRNM (Vitolište); unknown (Bitola).

Populus tremula L.

1930. Černjavski, p. 251.

Material: Lf

Location and stratigraphical range: Monastery Matka (sub-recent).

Collection: unknown

Populus tremula L. foss.

1996. Kitanov, p. 62, Pl. 1, Fig. 4.

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: IBER

Populus sp. 1

Djordjević Milutinović, *in collect.*

Material: Ds

Location and stratigraphical range: Čiflik, Ljuboš, Ljubočka River (Miocene).

Collection: NHMBEO

Populus sp. 2

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Populus sp. 3

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Populus sp. 4

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

Populus sp. 5

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Roždan (sub-recent).

Collection: NHMBEO

PTEROCARYA Kunth - JUGLANDACEAE

Pterocarya denticulata (Web.) Heer

1956. Pantich & Nikolich, p. 84, Pl. 2, Fig. 7; p. 87, 4, Fig. 2.

Rev. *Carya denticulata* (Web.) Schimp.; Bozukov, *hoc loco.*

Q

QUERCUS L. – FAGACEAE

Quercus apocynophyllum Ett.

1872. *Quercus apocynophyllum* Ettingshausen, p. 178, Pl. 4, Fig. 19.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

***Quercus cardanii* Massal.**

1859. *Quercus cardanii* Massalongo in Massalongo & Scarbelli, p. 179, Pl. 22-23, Fig. 10-14; Pl. 42, Fig. 13.

1993. *Quercus hartwissiana* Steven foss., Kitanov, P. 66, Pl. 4, Figs 1-2.

2021. *Quercus cardanii* Massal., Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Lukovo (Lower Pliocene); Oslomej, Suvodol, Vitolište (Pliocene).

Collection: IBER (Lukovo); MNHRNM (Oslomej, Suvodol, Vitolište).

***Quercus aff. cerris* L.**

1930. Černjavski, p. 251, p. 255.

Material: Lf

Location and stratigraphical range: Kisela Voda – tuffs, Monastery Matka (sub-recent).

Collection: unknown

***Quercus cf. conferta* Kit.**

1930. Černjavski, p. 251, p. 255.

Rev.: *Quercus aff. frainetto* Ten.; Bozukov, *hoc loco*.

***Quercus daphnes* Ung.**

1847. *Quercus daphnes* Unger, p. 112, Pl. 31, Figs 2-3.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

***Quercus drymeja* Ung.**

1847. *Quercus drymeja* Unger, p. 113, Pl. 32, Figs 1-4.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Carevo selo/Delčevo (Eocene); Skopje -Kisela Voda mine/Nerezi Village, Skopje (Oligocene).

Collection: NHMBEO

***Quercus sp. vel Banksia* sp.**

1847. *Quercus daphnes* Unger, p. 112, Pl. 31, Figs 2-3.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

***Quercus aff. frainetto* Ten.**

1930. *Quercus aff. conferta* Kit., Černjavski, p. 251, p. 255.

Material: Lf

Location and stratigraphical range: Kisela Voda - tuffs, Monastery Matka (sub-recent).

Collection: unknown

***Quercus ilex* L. foss.**

2017. *Quercus sosnowskyi* Kolakovsky; Stojanova, Petrov & Stefanova, p. 98, Fig. 2:2.

Material: Lf

Location and stratigraphical range: Nerezi Formation of Mariovo Basin (Upper Miocene).

Collection: unknown

***Quercus aff. ilex* L.**

1999. Bozukov et al., p. 15.

Material: Ds

Location and stratigraphical range: Vitolište (Pliocene).

Collection: MNHRNM

***Quercus hartwissiana* Steven foss.**

1993. Kitanov, P. 66, Pl. 4, Figs 1-2.

Rev.: *Quercus cardanii* Massal.; Bozukov, *hoc loco*.

***Quercus kubinyi* (Kováts ex Ettingsh.) Czezcott**

1852. *Castanea kubinyi* Kováts ex Ettingshausen, p. 6 (nomen).

1951. *Quercus kubinyi* (Kováts ex Ettingsh.) Czezcott, p. 372, Fig. 7.

2004. Mihajlović & Lazarević, p. 286, Pl. 2, Fig. 9.

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian); Suvodol (Pliocene).

Collection: MNHRNM (Suvodol); unknown (Bitola).

***Quercus cf. likudensis* Knobl. & Velitzelos**

1986. Knobloch & Velitzelos, p. 11, Pl. 3, Figs. 6, 9; Pl. 4, Fig. 1.

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Vitolište (Pliocene).

Collection: MNHRNM

***Quercus mediterranea* Unger**

1847. *Quercus mediterranea* Unger, p. 114, Pl. 32, Figs 5-9.

2017. Stojanova, Petrov & Stefanova, p. 98, Fig. 2:5.

2021. Bozukov et al., p. 15.

2004. Mihajlović & Lazarević, p. 286, Pl. 2, Figs 7-8.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene); Nerezi Formation of Mariovo Basin (Upper Miocene); Bitola (Upper Pontian - Lower Dacian); Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Skopje (Pliocene); Suvodol, Vitolište (Pliocene).

Collection: NHMBEO (Skopje); MNHRNM (Suvodol, Vitolište); unknown (Bitola, Nerezi Formation).

***Quercus neriifolia* (A. Braun) A. Braun in Heer**

1845. *Salix neriifolia* A. Braun, p. 170 (nomen).

1856. *Quercus neriifolia* A. Braun; Heer, p. 45, Pl. 74, Figs 1-7.

1994. *Quercus neriifolia* A. Braun var. *moesensis* Walther; Mihajlović, Ljubotenski, p. 207, Pl. 2, Figs 1-2.

2004. Mihajlović & Lazarević, p. 286, Pl. 5, Fig. 6.

2021. Bozukov et al., p. 15.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Babin Dol (Paleogene); Nemanjica, Sudik – Ovče Polje Basin (Upper Eocene); Bitola (Upper Pontian - Lower Dacian); Suvodol (Pliocene).

Collection: MNHRNM (Suvodol), NHMBEO (Babin Dol); unknown (Bitola).

***Quercus cf. pedunculata* Hoffm.**

1930. Černjavski, p. 251, 255, Text-fig 3: 1-2.

Rev.: *Quercus* aff. *robur* L.; Bozukov, *hoc loco.*

***Quercus petraea* Liebl. foss.**

1930. *Quercus* cf. *sessiliflora* Salisb., Černjavski, p. 251, 255, 257, Text-fig. 3: 3.

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Kisela Voda – tuffs, Matka and Berovo, Monastery Matka, Valandovo (sub-recent).

Collection: NHMBEO (Matka and Berovo); unknown (Monastery Matka, Valandovo).

***Quercus pseudocastanea* Göpp.**

1852. *Quercus pseudocastanea* Göppert, p. 274, Pl. 25, Figs 1-2.

1922. Pax, p. 308.

1948. Černjavski, p. 53, Pl. 2, Fig. 4.

1956. Pantich, p. 235, Pl. 1, Figs 3-4.

1975. Pantich & Pavlovski, p. 102.

1979. Pantich, Dumurtzanov & Pavlovski, p. 28, Pl. 1, Fig. 2.

2004. Mihajlović & Lazarević, p. 286, Pl. 3, Figs 1, 4.

2021. Bozukov et al., p.15.

Material: Lf

Location and stratigraphical range: Skopje (Miocene); Bitola (Upper Pontian - Lower Dacian). Bukovik (Lower Pliocene); Pulevec, Suvodol (Pliocene); Carina, Leskovec, Vranjevci (Upper Pliocene).

Collection: MNHRNM (Suvodol); unknown (Bitola,

Bukovik, Carina, Leskovec, Pulevec, Skopje, Vranjevci).

***Quercus cf. pseudocastanea* Göpp.**

1852. *Quercus pseudocastanea* Göppert, p. 274, Pl. 25, Figs 1-2.

1979. *Quercus cf. pseudocastanea* Göpp.; Pantich, Dumurtzanov & Pavlovski, p. 28, Pl. 1, Fig. 1.

Material: Lf

Location and stratigraphical range: Carina, Leskovec (Upper Pliocene).

Collection: unknown

***Quercus pseudorobur* Kovats**

1856. *Quercus pseudorobur* Kovats, p. 22, Pl. 2, Fig. 9.

2004. Mihajlović & Lazarević, p. 286, Pl. 3, Figs 6-7.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

***Quercus aff. pubescens* Willd.**

1930. Černjavski, p. 251, 255, 257, Text-fig. 2: 2.

Material: Lf

Location and stratigraphical range: Kisela Voda – tuffs, Monastery Matka, Valandovo (sub-recent).

Collection: unknown

***Quercus aff. robur* L.**

1930. *Quercus cf. pedunculata* Hoffm., Černjavski, p. 251, 255, Text-fig. 3: 1-2.

Material: Lf

Location and stratigraphical range: Kisela Voda – tuffs, Monastery Matka (sub-recent).

Collection: unknown

***Quercus cf. sessiliflora* Salisb.**

1930. Černjavski, p. 251, p. 255, Text-fig. 3: 3.

Rev.: *Quercus petraea* Liebl. foss.; Bozukov, *hoc loco*.

***Quercus sosnowskyi* Kolak.**

1955. *Quercus sosnowskyi* Kolakovsky, p. 447, Pl. 8,

Fig. 4.

2004. Mihajlović & Lazarević, p. 286, Pl. 3, Figs 2-3, 6-9, Pl. 4, Figs 2-5, 8-9.

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian); Vitolište (Pliocene).

Collection: MNHRNM; unknown (Bitola).

***Quercus sosnowskyi* Kolak.**

2017. *Quercus sosnowskyi* Kolakovsky; Stojanova, Petrov & Stefanova, p. 98, Fig. 2:2.

Rev.: *Quercus ilex* L. foss.; Bozukov, *hoc loco*.

Quercus sp. 1

1956. Pantich, p. 236.

Material: Lf

Location and stratigraphical range: Pulevec (Pliocene).

Collection: unknown

Quercus sp. 2

1975. Pantich & Pavlovski, p. 102.

Material: Lf

Location and stratigraphical range: Bukovik (Lower Pliocene).

Collection: unknown

Quercus sp. 3

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Roždan (sub-recent).

Collection: NHMBEO

***Quercus sp. (cf. drymeja* Ung.)**

1979. Pantich, Dumurtzanov & Pavlovski, p. 28, Pl. 1, Fig. 3.

Material: Lf

Location and stratigraphical range: Carina, Leskovec (Upper Pliocene).

Collection: unknown

Quercus sp. (section Robur)

Černjavski, *in collect.*

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene); Roždan (sub-recent).

Collection: NHMBEO

Quercus sp. (cf. ilex L.)

1956. Pantich, p. 236, Pl. 1, Fig. 5.

Rev.: *Fagus pliocenica* Saporta; Bozukov, *hoc loco.*

R

RHAMNUS L. – RHAMNACEAE

Rhamnus cf. roeslerii Ett.

1955b. Milaković, p. 110, Pl. 2, Fig. 4.

Rev.: 1994. *Eotrigonobalanus furcinervis* (Rossm.) Walther & Kvaček; Mihajlovič & Ljubotenski, p. 204.

Rhamnus rossmässleri Ung.

1850a. *Rhamnus rossmässleri* Unger, p. 464.

1922. Pax, p. 313.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

RHODODENDRON L. – ERICACEAE

Rhododendron ponticum L. foss.

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Suvodol (Pliocene).

Collection: MNHRNM

Rhododendron sp.

1922. Pax, p. 313.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

RHODOMYRTOPHYLLUM Ruffle & Jähnichen – MYRTACEAE

Rhodomyrtophyllum sinuatum (Bandulska) Walther

1931. *Rhodomyrtus sinuata* Bandulska, p. 657, Pl. 39, Figs 1-2, 4-5, 8; Figs-text 8-11.

1985. *Rodomyrtophyllum sinuatum* (Bandulska) Walther in Mai & Walther, p. 102, Pl. 26-28, Figs 5-7.

1994. Mihajlovič, Ljubotenski, p. 207, Pl. 2, Fig. 19.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Nemanjica - Ovče Polje Basin (Upper Eocene); Skopje - Bulačani and Kučkovo village (Paleogene); Skopje - Kisela Voda mine/ Nerezi Village, Skopje (Oligocene).

Collection: NHMBEO (Skopje); unknown (Nemanjica).

RHUS L. – ANACARDIACEAE

Rhus stygia Ung.

1847. *Rhus stygia* Unger, p. 86, Pl. 22, Figs 3-5.

1967. Pax, p. 312.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

ROBINIA L. – FABACEAE

Robinia subcordata Wess. & Web.

1956. *Robinia subcordata* Wessel & Weber, p. 161, Pl. 29, Fig. 21.

1922. Pax, p. 311.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

RUBUS L. – ROSACEAE

Rubus cf. anatolicus (Focke) Hausskn.

1930. Černjavski, p. 257.

Rev. *Rubus* aff. *ulmifolius* subsp. *sanctus* (Schreb.) Sudre; Bozukov, *hoc loco*.

***Rubus* aff. *ulmifolius* Schott. subsp. *sanctus* (Schreb.) Sudre**

1930. *Rubus* cf. *anatolicus* (Focke) Hausskn.; Černjavski, p. 257.

Material: Lf

Location and stratigraphical range: Valandovo (sub-recent).

Collection: unknown

S

SALIX L. – SALICACEAE

***Salix* cf. *alba* L.**

1930. Černjavski, p. 251, Text-fig. 1: 1.

Material: Lf

Location and stratigraphical range: Monastery Matka (sub-recent).

Collection: unknown

***Salix angusta* A. Braun**

1851. Braun in Stizenberger, p. 77.

1956. Pantich & Nikolich, p. 82, Pl. 2, Fig. 1.

Material: Lf

Location and stratigraphical range: Oslomej (Dacian).

Collection: unknown

***Salix* aff. *carpea* L.**

1930. Černjavski, p. 251, 255, 257, Text-fig. 4: 3.

Material: Lf

Location and stratigraphical range: Kisela Voda – tuffs; Monastery Matka, Valandovo (sub-recent).

Collection: unknown

***Salix* aff. *cinerea* L.**

1930. Černjavski, p. 251, 255.

Material: Lf

Location and stratigraphical range: Kisela Voda – tuffs; Monastery Matka, Valandovo (sub-recent).

Collection: unknown

***Salix varians* Göpp.**

1855. *Salix varians* Göppert, p. 26, Pl. 19, Figs 17-18; Pl. 20, Figs 1-2.

1956. Pantich & Nikolich, p. 86, Pl. 4, Fig. 3.

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: unknown

***Salix* sp. 1**

1988. Milovanović & Mihajlović, p. 335, Pl. 2, Fig. 12.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

***Salix* sp. 2**

1955a. Milaković, p. 149, Pl. 1, Fig. 1.

Material: Lf

Location and stratigraphical range: Katlanovo (Lower Pliocene).

Collection: NHMBEO

***Salix* sp. 3**

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: NHMBEO

***Salix* sp. 4**

2004. Mihajlović & Lazarević, p. 286, Pl. 5, Fig. 1.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

SAPOTACITES Ett. – SAPOTACEAE

***Sapotacites lanceolatus* Ett.**

1853. *Sapotacites lanceolatus* Ettingshausen, p. 62, Pl. 21, Fig. 24.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

SASSAFRAS T. Nees – LAURACEAE

***Sassafras* sp. 1**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Sassafras* sp. 2**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Middle Miocene).

Collection: NHMBEO

SORBUS L. – ROSACEAE

***Sorbus aria* L.**

1930. Černjavski, p. 251.

Material: Lf

Location and stratigraphical range: Monastery Matka (sub-recent).

Collection: unknown

T

THEVETIA Adans. – APOCYNACEAE

***Thevetia sophiae* (Weber) Palam. & Petk.**

1852. *Echitonium sophiae* Weber, p. 187, Pl. 20, Figs 17a-b.

1988. Milovanović & Mihajlović, p. 335, Pl. 1, Fig. 6.

1994. *Thevetia sophiae* (Weber) Palamarev & Petkova, p. 41, Pl. 1, Fig. 5; Pl. 2; Figs 1-2, 4.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

TILIA L. – MALVACEAE

***Tilia* sp. 1**

1930. Černjavski, p. 251, 255, 257.

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Kisela Voda - tuffs; Monastery Matka, Matka and Berovo, Valandovo (sub-recent).

Collection: NHMBEO (Matka and Berovo); unknown (Kisela Voda - tuffs, Monastery Matka, Valandovo).

***Tilia* sp. 2**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Tilia* sp. 3**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Roždan (sub-recent).

Collection: NHMBEO

***Tilia* sp. 4**

2004. Mihajlović & Lazarević, p. 286, Pl. 5, Figs 5, 7.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

TRIGONOBALANOPSIS Kvaček & Walther – FAGACEAE

***Trigonobalanopsis rhamnoides* (Rossm.) Kvaček & Walther**

1852. *Rhamnus dechenii* Weber, p. 204, Pl. 23, Fig. 2.

1988. *Trigonobalanopsis rhamnoides* (Rossm.) Kvaček & Walther, p. 405, Pl. 49, Figs 1-8; Pl. 50, Figs 1-4; Pl. 51, Figs 1-6; Pl. 52, Figs 1-12; Pl. 53, Figs 1-12; Pl. 54, Figs 1-4.

1994. *Trigonobalanopsis* cf. *rhamnoides* (Rossm.) Kvaček & Walther; Mihajlovič & Ljubotenski, p. 207, Pl. 1, Figs 6, 16.

Material: Lf

Location and stratigraphical range: Nemanjica, Sudik – Ovče Polje Basin (Upper Eocene).

Collection: unknown

U

ULMUS L. – ULMACEAE

***Ulmus* cf. *campestris* L.**

1930. Černjavski, p. 255, 257.

Rev. *Ulmus* aff. *minor* Mill.; Bozukov, *hoc loco*.

***Ulmus carpinooides* Göpp.**

1855. *Ulmus carpinooides* Göppert, p. 28, Pl. 13, Figs 4-8; Pl. 14, Fig. 1.

1955a. Milaković, p. 151, Pl. 2, Figs 1-3.

1979. Pantich, Dumurtzanov & Pavlovski, p. 28, Pl. 1, Fig. 5.

2004. Mihajlovič & Lazarevič, p. 286, Pl. 2, Fig. 3.

2021. Bozukov et al., p. 16.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian); Katlanovo (Lower Pliocene); Oslomej (Pliocene); Carina, Leskovec (Upper Pliocene).

Collection: MNHRNM (Oslomej); NHMBEO (Katlanovo); unknown (Bitola, Carina, Leskovec).

***Ulmus glabra* Huds.**

1993. Kitanov, p. 68, Pl. 5, Figs 1-3.

Material: Ds

Location and stratigraphical range: Lukovo (Lower Pliocene).

Collection: IBER

***Ulmus glabra* Huds. foss.**

1930. *Ulmus* aff. *montana* Stokes, Černjavski, p. 255.

Černjavski, *in collect*.

Material: Lf

Location and stratigraphical range: Kisela Voda – tuffs, Matka and Berovo (sub-recent).

Collection: NHMBEO (Matka and Berovo)

***Ulmus laevis* Pall. foss.**

Černjavski, *in collect*.

Material: Lf

Location and stratigraphical range: Matka and Berovo (sub-recent).

Collection: NHMBEO

***Ulmus longifolia* Ung.**

1955a. Milaković, p. 151, Pl. 2, Figs 4-5, 8.

1979. Pantich, Dumurtzanov & Pavlovski, p. 28.

1993. Kitanov, p. 68, Pl. 4, Fig. 4.

Rev. 1987. *Ulmus pyramidalis* Göpp.; Palamarev & Petkova, p. 55, Pl. 16, Figs 1-2; Pl. 21, Fig. 3.

***Ulmus* aff. *minor* Mill.**

1930. *Ulmus* aff. *campestris* L., Černjavski, p. 255, 257, Text-fig. 4: 5.

Material: Lf

Location and stratigraphical range: Kisela Voda – tuffs, Valandovo (sub-recent).

Collection: unknown

***Ulmus* cf. *montana* Stokes.**

1930. Černjavski, p. 255.

Rev. *Ulmus glabra* Huds. foss.; Bozukov, *hoc loco*.

***Ulmus pyramidalis* Göpp.**

1855. *Ulmus pyramidalis* Göppert, p. 28, Pl. 13, Figs

10-12.

1955a. *Ulmus longifolia* Ung.; Milaković, p. 151, Pl. 2, Figs 4-5, 8.

1979. Pantich, Dumurtzanov & Pavlovski, p. 28.

1993. Kitanov, p. 68, Pl. 4, Fig. 4.

Material: Lf

Location and stratigraphical range: Katlanovo, Lukovo (Lower Pliocene); Carina, Leskovec (Upper Pliocene).

Collection: IBER (Lukovo); NHMBEO (Katlanovo); unknown (Carina, Leskovec).

Ulmus sp. 1

1930. Černjavski, p. 257.

Černjavski, *in collect.*

Material: Lf

Location and stratigraphical range: Matka and Berovo, Valandovo (sub-recent).

Collection: NHMBEO (Matka and Berovo); unknown (Valandovo).

Ulmus sp. 2

2004. Mihajlović & Lazarević, p. 286.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown

V

VITIS L. – VITACEAE

***Vitis sylvestris* Gmel. foss.**

1993. Kitanov, p. 69, Pl. 5, Fig. 4.

2017. *Acer tricuspidatum* A. Braun in Bronn; Stojanova, Petrov & Stefanova, p. 98, Fig. 2:1.

2021. Bozukov et al., p. 16.

Material: Lf

Location and stratigraphical range: Nerezi Formation of Mariovo Basin (Upper Miocene); Lukovo (Lower Pliocene); Oslomej (Pliocene).

Collection: IBER (Lukovo); MNHRNM (Oslomej).

Z

ZELKOVA Spach - ULMACEAE

***Zelkova ungeri* Kovatz**

1979. Pantich, Dumurtzanov & Pavlovski, p. 28.

Rev. 1987. *Zelkova zelkovifolia* (Unger) Bůžek & Kotlaba in Kotlaba; Palamarev & Petkova, p. 57, Pl. 15, Fig. 3.

***Zelkova zelkovifolia* (Unger) Bůžek & Kotlaba**

1843. *Ulmus zelkovifolia* Unger, p. 405, Pl. 24, Figs 9-12.

1963. *Zelkova zelkovifolia* (Ung.) Bůžek & Kotlaba in Kotlaba, p. 59, Pl. 3, Figs 7-8.

1979. *Zelkova ungeri* Kovatz; Pantich, Dumurtzanov & Pavlovski, p. 28.

2004. *Zelkova zelkovifolia* (Ung.) Bůžek & Kotlaba in Kotlaba, Mihajlović & Lazarević, p. 286, Pl. 1, Figs 12-13.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Middle Miocene); Skopje - Orthodox cemetery (Miocene or Lower Pliocene); Bitola (Upper Pontian - Lower Dacian); Carina, Leskovec (Upper Pliocene).

Collection: NHMBEO (Skopje); unknown (Bitola, Carina, Leskovec).

Zelkova sp. 1

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene).

Collection: NHMBEO

Zelkova sp. 2

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Zelkova sp. 3

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

ZIZIPHUS Mill. - RHAMNACEAE

***Ziziphus ziziphoides* (Unger) Weyland**

1847. *Ceanothus ziziphoides* Unger, p. 145, Pl. 49, Fig. 10.

1948. *Ziziphus ziziphoides* (Unger) Weyland, p. 113.

1994. Mihajlovič & Ljubotenski, p. 207, Pl. 1, Figs 4-5.

2021. Bozukov et al., p. 16.

Material: Lf

Location and stratigraphical range: Nemanjica, Sudik, Ramadanica – Ovče Polje Basin (Upper Eocene).

Collection: MNHRNM (Sudik)

2. Class LILIOPSIDA

F

FLABELLARIA Cav. – MALPIGIACEAE

***Flabellaria latania* Rossm.**

1954. *Flabellaria latania* Rossm.; Pantič, p. 169.

Rev.: 1994. *Trachycarpus rhapifolia* (Sternb.) Takht.; Mihajlovič & Ljubotenski, p. 204, Fig. 2A.

P

PHRAGMITES Adans. – POACEAE

***Phragmites oeningensis* A. Braun ex Heer**

1855. *Phragmites oeningensis* A. Braun; Heer, p. 64, Pl. 22, Fig. 5; Pl. 24, Figs 1-10; Pl. 27, Fig. 2; Pl. 29, Fig. 3a.

1988. Milovanović & Mihajlovič, p. 335, Pl. 1, Figs 8-9.

1996. Kitanov, p. 66, Pl. 1, Fig. 7.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene); Živojno (Upper Pliocene).

Collection: IBER (Živojno)

***Phragmites* sp.**

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Vitolište (Pliocene).

Collection: MNHRNM

POACITES Brongn. – POACEAE

***Poacites aequalis* Ett.**

1867. *Poacites aequalis* Ettingshausen, p. 24, Pl. 6, Fig. 8.

1956. Pantič, p. 238, Pl. 1, Fig. 1.

Material: Lf

Location and stratigraphical range: Pulevec (Pliocene).

Collection: unknown

POTAMOGETON L. – POTAMOGETONACEAE

***Potamogeton* sp.**

2021. Bozukov et al., p. 15.

Material: Lf

Location and stratigraphical range: Suvodol (Pliocene).

Collection: MNHRNM

R

RUPPIA L. – POTAMOGETONACEAE

***Ruppia pannonica* Unger**

1847. *Ruppia pannonica* Unger, p. 45, Pl. 15, Figs 2 b-e.

2021. Bozukov et al., p. 15

Material: Lf

Location and stratigraphical range: Vitolište (Pliocene).

Collection: MNHRNM

S

SMILAX L. – SMILACACEAE

***Smilax aff. bona-nox* L.**

1988. *Smilax* sp., Milovanović & Mihajlović, p. 335, Pl. 2, Fig. 18.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown***Smilax* sp.**

1988. Milovanović & Mihajlović, p. 335, Pl. 2, Fig. 18.

Rev. *Smilax aff. bona-nox* L.; Bozukov, *hoc loco*.

T

TRACHYCARPUS Wendl. – ARECACEAE

***Trachycarpus rhapifolia* (Sternb.) Takht.**

1922. *Flabellaria rhapifolia* Sternberg, p. 32, Pl. 21, Fig. 1

1954. *Flabellaria latania* Rossm.; Pantič, p. 169.

1958. *Trachycarpus rhapifolia* (Sternb.) Takhtajan, p. 1670, Pl. 4, Figs 1-5.

1994. Mihajlović & Ljubotenski, p. 204, Fig. 2A.

Material: Lf

Location and stratigraphical range: Bekirli – Ovče Polje Basin (Upper Eocene).

Collection: Pantič collection

TYPHA L. – TYPHACEAE

***Typha latifolia* L. foss.**

1996. Kitanov, p. 66, Pl. 2, Fig. 1.

Material: Lf

Location and stratigraphical range: Živojno (Upper Pliocene).

Collection: IBER***Typha latissima* A. Braun**

1851. *Typha latissima* A. Braun in Stizenberger, p.

75, (nomen).

1922. Pax, p. 305.

2021. Bozukov et al., p. 16.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene); Carevo selo/Delčevo (Eocene); Čiflik, Ljuboš, Ljubočka River, Skopje (Miocene); Oslomej, Suvodol, Vitolište (Pliocene).

Collection: MNHRNM (Oslomej, Suvodol, Vitolište); NHMBEO (Carevo selo/Delčevo, Skopje - Bulačani and Kučkovo village, Čiflik, Ljubočka River, Ljuboš).

GEN. ET SP. INDET.

Anacardiaceae cf. *Rhus* sp.

Djordjević Milutinović, *in collect*.

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo Village (Paleogene).

Collection: NHMBEO**Betulaceae indet.**

2004. Mihajlović & Lazarević, p. 286, Pl. 2, Fig. 1.

Material: Lf

Location and stratigraphical range: Bitola (Upper Pontian - Lower Dacian).

Collection: unknown**Cupressaceae gen. et sp. indet.**

Djordjević Milutinović, *in collect*.

Material: Ds

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO**Coniferales cf. *Glyptostrobus europaeus* (Brongn.) Ung.**

Djordjević Milutinović, *in collect*.

Material: Ds

Location and stratigraphical range: Skopje

(Oligocene).

Collection: NHMBEO

Coniferales aff. *Tsuga* sp.

Djordjević Milutinović, *in collect.*

Material: Ds

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Cupressaceae cf. *Cupresites richteri* Eng.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Cupressaceae gen. et spec. indet.

Djordjević Milutinović, *in collect.*

Material: Twig

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Cupressaceae cf. *Glyptostrobus europaeus* (Brongn.) Ung.

Djordjević Milutinović, *in collect.*

Material: Fertile twig

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Dicotyledonae gen. et spec. indet. 1

2021. Bozukov et al., p. 14.

Material: Lf

Location and stratigraphical range: Sudik (Upper Eocene).

Collection: MNHRNM

Dicotyledonae gen. et spec. indet. 2

1988. Milovanović & Mihajlović, p. 335, Pl. 2, Figs 8, 10, 13, 15.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

***Dicotylophyllum* indet. 1**

1955a. *Andromeda protogaeae* Unger; Milaković, p. 153, Pl. 2, Fig. 6.

Material: Lf

Location and stratigraphical range: Katlanovo (Lower Pliocene).

Collection: NHMBEO

***Dicotylophyllum* indet. 2**

1955b. *Andromeda protogaeae* Unger; Milaković, p. 110, Pl. 2, Fig. 6.

1994. Mihajlovič & Ljubotenski, p. 204.

Material: Lf

Location and stratigraphical range: Krivi Do – Ovče Polje Basin (Upper Eocene).

Collection: NHMBEO

***Dicotylophyllum* indet. 3**

1955b. *Cinnamomum* sp.; Milaković, p. 110, Pl. 2, Figs 1-3.

1994. Mihajlovič & Ljubotenski, p. 204.

Material: Lf

Location and stratigraphical range: Krivi Do – Ovče Polje Basin (Upper Eocene).

Collection: NHMBEO

***Dicotylophyllum* indet. 4**

1955b. *Ficus* sp.; Milaković, p. 110, Pl. 1, Fig. 1.

1994. Mihajlovič & Ljubotenski, p. 204.

Material: Lf

Location and stratigraphical range: Krivi Do – Ovče Polje Basin (Upper Eocene).

Collection: NHMBEO

***Dicotylophyllum* indet. 5**

2004. *Dicotylophyllum* indet.; Mihajlovič & Lazarević, Pl. 3, Fig. 5.

Rev. *Euonymus* aff. *japonicus* Thunb.; Bozukov, *hoc loco*.

***Dicotylophyllum* aff. *Banksia* sp.**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Dicotylophyllum* aff. *Fabaceae

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

***Dicotylophyllum* aff. *Myrica* sp.**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 1**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Čiflik, Ljuboš, Ljubočka River (Miocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 2**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Čiflik, Ljubočka River, Ljuboš (Miocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 3**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 4**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 5**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 6 (aff. *Tilia*)**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 7 [cf. *Platanus leucophylla* (Ung.) Knobl.]**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 8**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene).

Collection: NHMBEO

***Dicotylophyllum* sp. 9**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo Village (Paleogene).

Collection: NHMBEO

***Dicotylophyllum* sp. 10 (aff. *Platanus neptuni* mf. *hibernica* (Johnson & Gilmore) Kvaček & Manchester)**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 11**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 12**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 13**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 14**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Middle Miocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 15**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - (Oligocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 16**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 17**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

***Dicotylophyllum* sp. 18**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Pliocene).

Collection: NHMBEO

***Dicotylophyllum* spp. (aff. genus *Alnus*, *Acer*, *Quercus* (section *Robur*) in mass.)**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

***Ericaceae* gen. et sp. indet.**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

***Fabaceae* gen. et sp. indet. 1**

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Fabaceae gen. et sp. indet. 2

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo Village (Paleogene).

Collection: NHMBEO

Fabaceae gen. et sp. indet. 3

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

Fabaceae gen. et sp. indet. 4

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Fabaceae gen. et sp. indet. 5

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Fabaceae gen. et sp. indet. 6

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

Fabaceae gen. et sp. indet. 7

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Sopište (Oligocene).

Collection: NHMBEO

Gymnospermae gen. et sp. indet.

Djordjević Milutinović, *in collect.*

Material: Twig

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Lauraceae cf. *Daphnogene* sp.

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene).

Collection: NHMBEO

Lauraceae gen. et spec. indet. 1

1994. Mihajlović & Ljubotenski, p. 207, Pl. 2, Fig. 12.

Material: Lf

Location and stratigraphical range: Sudik (Upper Eocene).

Collection: unknown

Lauraceae gen. et spec. indet. 2

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Čiflik, Ljubočka River, Ljuboš (Miocene).

Collection: NHMBEO

Lauraceae gen. et spec. indet. 3

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Lauraceae gen. et spec. indet. 4

Djordjević Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

Lauraceae type

1988. Milovanović & Mihajlovič, p. 335, Pl. 2, Figs 4-7.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

Leguminosae (= Fabaceae) gen. et spec. indet.

1994. Mihajlovič & Ljubotenski, p. 207.

Material: Lf

Location and stratigraphical range: Nemanjica, Ramadanica – Ovče Polje Basin (Upper Eocene).

Collection: unknown

Leguminosae (= Fabaceae) type

1988. Milovanović & Mihajlovič, p. 335, Pl. 2, Fig. 9.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

Monocotyledonae gen. et spec. indet. 1

1922. Pax, p. 305.

Material: Lf

Location and stratigraphical range: Skopje (Miocene).

Collection: unknown

Monocotyledonae gen. et spec. indet. 2

1975. Pantich & Pavlovski, p. 102.

Material: Lf

Location and stratigraphical range: Bukovik (Lower Pliocene).

Collection: unknown

Monocotyledonae gen. et spec. indet. 3

1988. Milovanović & Mihajlovič, p. 335.

Material: Lf

Location and stratigraphical range: Kočane (Oligocene).

Collection: unknown

Pinaceae gen. et sp. indet.

Djordjevič Milutinović, *in collect.*

Material: Ds

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Poaceae gen. et spec. indet. 1

Djordjevič Milutinović, *in collect.*

Material: Ds

Location and stratigraphical range: Čiflik, Ljuboš, Ljubočka River (Miocene).

Collection: NHMBEO

Poaceae gen. et spec. indet. 2

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Čiflik, Ljubočka River, Ljuboš (Miocene).

Collection: NHMBEO

Poaceae gen. et spec. indet. 3

Djordjevič Milutinović, *in collect.*

Material: Stem

Location and stratigraphical range: Čiflik, Ljubočka River, Ljuboš (Miocene).

Collection: NHMBEO

Poaceae gen. et spec. indet. 4

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Bulačani and Kučkovo village (Paleogene).

Collection: NHMBEO

Poaceae gen. et spec. indet. 5

Djordjevič Milutinović, *in collect.*

Material: Lf

Location and stratigraphical range: Skopje - Kisela Voda mine/Nerezi Village (Oligocene).

Collection: NHMBEO

Poaceae gen. et spec. indet. 6

Djordjević Milutinović, in collect.

Material: Lf

Location and stratigraphical range: Sopište (Oligocene).

Collection: NHMBEO

Rosaceae gen. et spec. indet. 1

Djordjević Milutinović, in collect.

Material: Lf

Location and stratigraphical range: Skopje - Vardar River (Miocene).

Collection: NHMBEO

Rosaceae gen. et spec. indet. 2

Djordjević Milutinović, in collect.

Material: Lf

Location and stratigraphical range: Skopje (Pliocene).

Collection: NHMBEO

Sequoia sp. vel Taxus sp.

Djordjević Milutinović, in collect.

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Taxodiaceae cf. Glyptostrobus europaeus (Brongn.) Ung.

Djordjević Milutinović, in collect.

Material: Ds, twig

Location and stratigraphical range: Skopje - Orthodox cemetery (Miocene or Lower Pliocene).

Collection: NHMBEO

Ulmaceae aff. Zelkova sp.

Djordjević Milutinović, in collect.

Material: Lf

Location and stratigraphical range: Skopje

(Oligocene).

Collection: NHMBEO

Ulmus sp. vel Zelkova sp.

Djordjević Milutinović, in collect.

Material: Lf

Location and stratigraphical range: Skopje (Oligocene).

Collection: NHMBEO

Conclusions

This catalog of fossil plants presents the diversity of the Cenozoic flora in the RN Macedonia, as well as showing the development and changes of this flora and vegetation in different localities during the Cenozoic of the country's territory. The transition from a tropical flora during the Paleogene to a flora associated with a temperate climate during the Quaternary is clearly visible.

Based on the composition of the vegetation present in the catalog we can confirm Pantich's (1954) opinion about the warm and humid climate and the typical tropical flora of the Paleogene in Europe.

According to the conclusions of Pantich & Nikolich (1956), palaeoflora studies show that the vegetation of the Balkan Peninsula during the Pliocene differed from the Central European and Northern European flora. In addition, the Pliocene floras of RN Macedonia show warmer characteristics than the Pliocene floras of Bulgaria and Croatia, which are closer to the modern flora composition of the Balkan Peninsula. This difference can be explained by a specific relief and proximity to large water bodies, which makes the access of warmer and moister air masses possible.

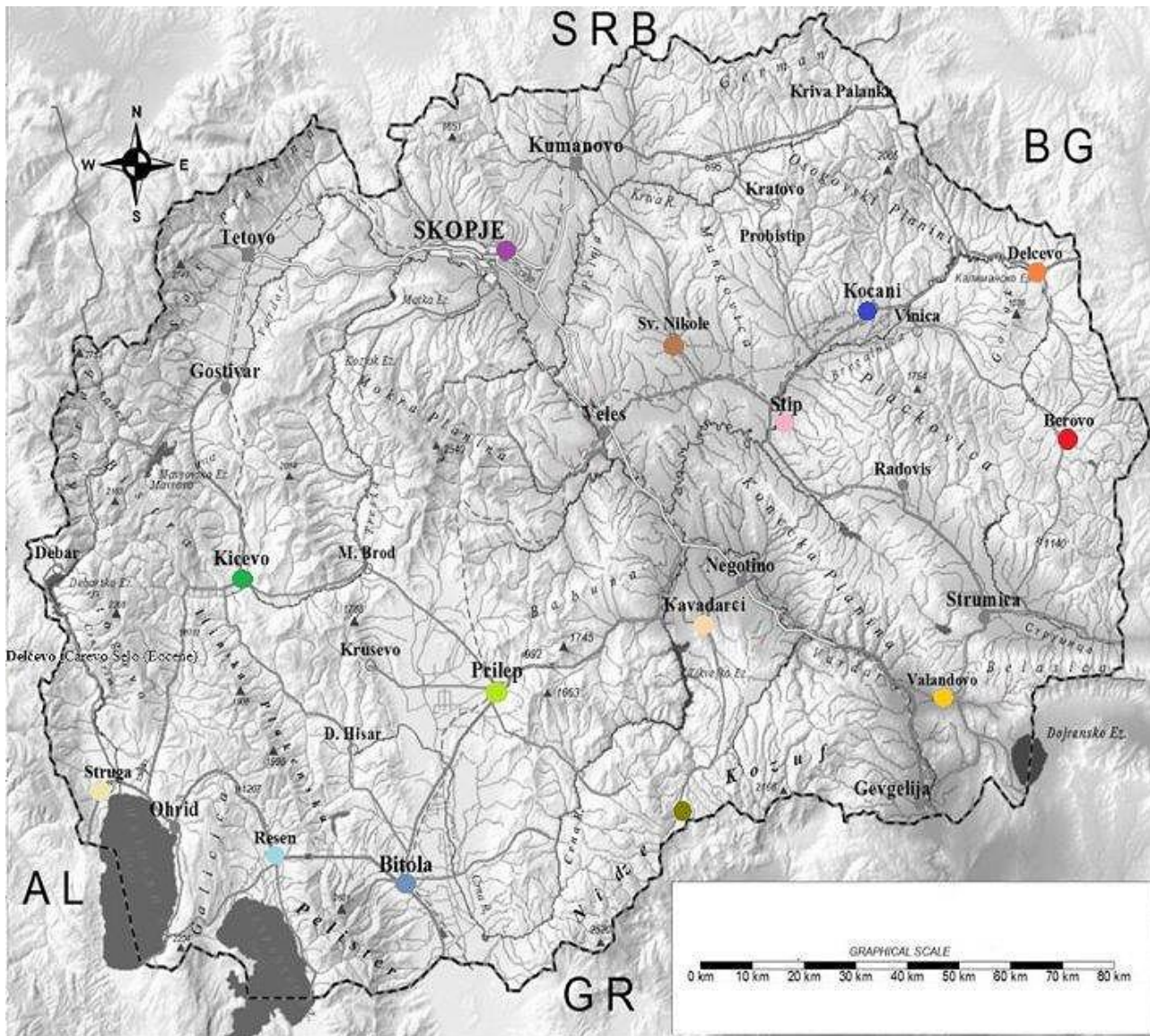


Fig. 1 Localities of Cenozoic floras in Republic of North Macedonia

- Kočane (Oligocene) ● Štip (Sudik, Krivi Do, Sheboa and Ramadanica (Upper Eocene)) ● Kičevo (Oslomej (Pliocene, Daclian))
- Skopje (Babin Dol, Bulačani and Kučkovo (Paleogene); Kisela Voda, Nerezi village and Sopište (Oligocene); Čiflik, Ljuboš, Ljubočka river and Orthodox cemetery (Miocene); Katlanovo and Bukovik (Lower Pliocene) and Matka (subrecent)) ● Valandovo (subrecent) ● Berovo (subrecent)
- Sveti Nikole (Nemanjica, Bekirli and Ovčje Pole (Upper Eocene)) ● Bitola (Žvojno and Vranjevi (Upper Pliocene) and Suvodol (Pliocene))
- Struga (Lukovo (Lower Pliocene)) ● Prilep (Mariovo (Upper Miocene) and Vitolište (Pliocene)) ● Resen (Carina, Leskovec (Upper Pliocene))
- Pulevec (Pliocene) – border line between RNM and Greece ● Kavadarci (Roždan (subrecent)) ● Delčevo (Carevo Selo (Eocene))

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