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EUGENIA SPLENDENS PETRESCU, G. MARGARIT ET M. MARGARIT 1976, IN THE BULGARIAN PALEOFLORA

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Abstract. Leaf imprints determined by Palamarev and Petkova (1994) as *Eugenia splendens* PETRESCU et al. 1976 have been re-examined in detail.
On the basis of that analysis, we found that analogical types in the Bulgarian fossil flora had been already determined as *Eucalyptus oceanica* UNGER, as well as *Periploca* cf. *kryshtofovichii* KORN. After detailed comparison of data in the Bulgarian literature with those on the types of all the fossil species mentioned above, we have concluded that the Bulgarian specimens are all the same leaf type, close to the species *P. kryshtofovichii*.
The rest of the material published by Palamarev and Petkova (1994) as *Eugenia splendens* has features typical for that species, except the smaller dimensions.

Keywords: Bulgaria, *Eucalyptus oceanica, Eugenia splendens*, Paleoflora, Paleogene, *Periploca kryshtofovichii.*

INTRODUCTION

The fossil species *Eugenia splendens* has been recorded in Bulgaria by Palamarev and Petkova (1994) in two regions: in Upper Eocene deposits of the Souhostrel Formation, Padesh Graben, SW Bulgaria and in Priabonian-Lower Oligocene deposits in the Hvoina Graben, Central Rhodopes (Fig. 1).

The holotype of the species (Pl. I, Fig. 3) comes from Eocene sediments in Girbou-Cluj region, in the northwestern part of the Transylvanian Depression, Romania (Petrescu et al. 1976). The authors of the fossil species have published figures of leaf imprints of *Eugenia splendens,* including of the holotype itself; they are defined as having a narrow elliptic lamina, according to the classification of Dilcher (1974). Accordingly it is obvious that a difference exists between the shape of *Eugenia splendens* leaves and that of the species determined by different authors in the Bulgarian paleoflora as *Eucalyptus oceanica* (Pl. I, Fig. 9), *Periploca* cf. *kryshtofovichii* (Pl. I, Fig. 10), or *Eugenia splendens* (Pl. I, Fig. 4), which is lanceolate.

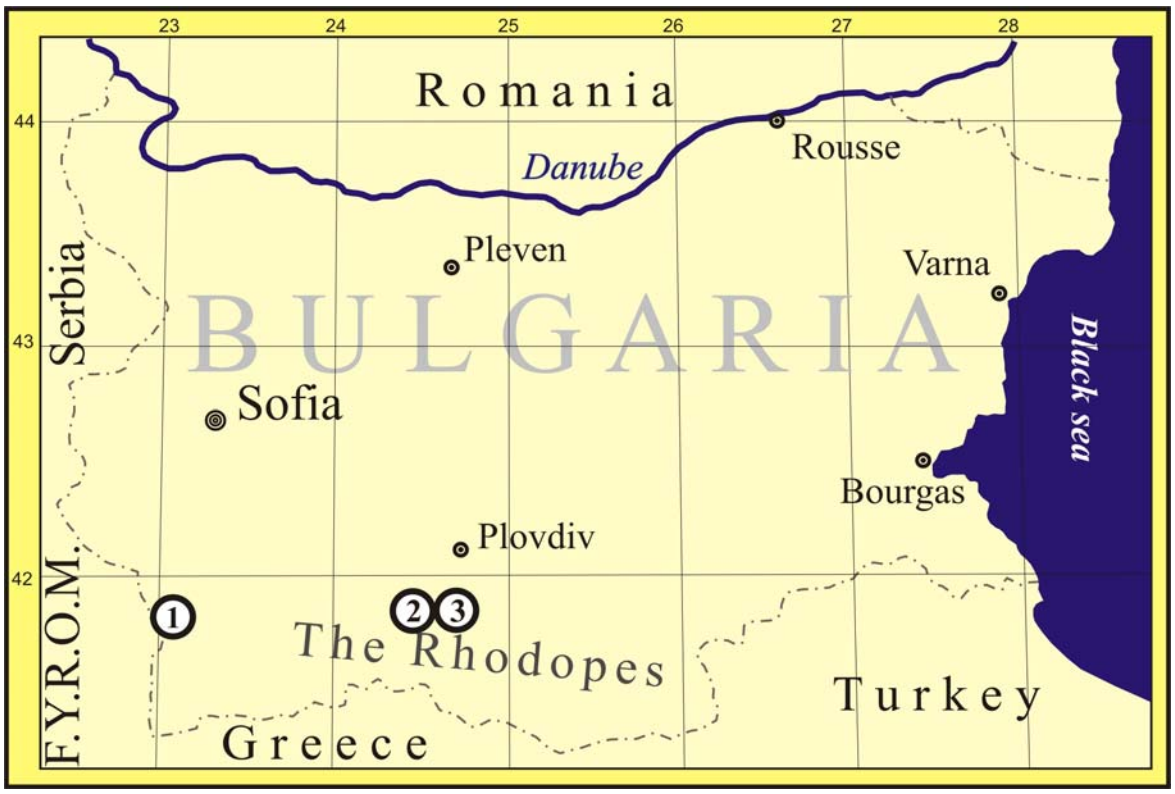

Figure 1 - Sketch map showing the geographic distribution of the species *Eugenia splendens* in Bulgaria (after Palamarev & Petkova 1994): 1 – Suhostrel (?); 2 – Orehovo; 3 – Pavelsko.

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MATERIALS AND METHODS

The material investigated by us (SmP-170 a, b) originates from Paleogene sedimentary rocks of the Hvoina Graben, close to the Pavelsko village.

Specimens from the collections of the Department of Paleobotany and pollen analysis (CDPPA) and the Herbarium of Vascular Plants (SOM) of the Institute of Botany, Bulgarian Academy of Sciences, were used for comparing fossil and recent specimens. The classification of Dilcher (1974) was used for determining the morphological features of the leaf imprints.

DISCUSSION

The material determined by Konjaroff (1932) as *Eucalyptus oceanica* (Pl. I, Fig. 9) originates from sedimentary rocks dated as Late Oligocene (Palamarev 1961, 1962), situated above the coal bed of the Dospei basin (Rila Mountain). It does not have the typical features of genus *Eucalyptus, e.g.* the shape of the base of the leaf lamina, the angle of divergence between the secondary veins and the midvein, and the shape of the secondary veins.

The base of the lamina of the leaf imprint, as pointed out by Konjaroff (1932), is obtuse normal, while for genus *Eucalyptus* it is obtuse decurrent. The secondary veins near the base of the leaf lamina for genus *Eucalyptus* follow the shape of the base, and their arcs point to the tip of the leaf, while those published by Konjaroff (op. c.) point to the base of the leaf. The angle of divergence of secondary veins from the midvein for *Eucalyptus* is sharper (Pl. I, Figs 5-7) than the one of the fossil described by Konjaroff.

Palamarev & Petkova (1994) determined as *Eugenia splendens* a leaf imprint (Pl. I, Fig. 4) from sediments of the Hvoina Graben (Orehovo village, Central Rhodopes), which were dated as Priabonian-Early Oligocene (Černjavska et al. 1988). The shape of its lamina, however, is lanceolate and does not correspond to that of the species published by Petrescu et al. (1976), which is narrow elliptic as mentioned above.

The leaf imprint from Orehovo village (Pl. I, Fig. 2), as pointed out by Palamarev and Petkova (1994), as well as the material shown here (Pl. I, Fig. 1) from the same sediments found close to Pavelsko village (Central Rhodopes), corresponds to the description of *Eugenia splendens*.

Palamarev and Petkova (1975) determined as *Periploca* cf. *kryshtofovichii* KORNILOVA a well-conserved leaf imprint (Pl. I, Fig. 10) from the region of Gabrovo village (SW Bulgaria). The fossil comes from Late Eocene sediments that are a part of Logodash Formation (Padesh Graben) (Zagorchev et al. 1989). Comparing the morphological features of the leaf lamina, the authors reached the conclusion that the fossil differs insignificantly from the type described by Kornilova (1960) (Pl. I, Figs 11-13). Therefore they accepted it as a Balkan variation of the species and used the combination *Periploca* cf. *kryshtofovichii*. They accepted the species *Periploca forrestii* SCHLTR. (Pl. I, Fig. 17) for the nearest living relative of that paleotaxon.

Kornilova (1960) herself has discussed the species *Periploca kryshtofovichii* as an ancestral taxon of the contemporary *P. sepium* BGE. (Pl. I, Fig. 14), *P. calophylla* FALC. (Pl. I, Fig. 16), and *P. graeca* L. (Pl. I, Fig. 15), which today are distributed in different parts of Eurasia. According to the author the different geographical areas were the reason for differentiation of those three recent species from the fossil with which they have many common features.

Palamarev & Petkova (1994) determined as *Eugenia splendens* fossil material similar to that discussed above from Upper Eocene deposits of the Souhostrel Formation (Padesh Graben) (Zagorchev et al. 1989). Unfortunately we do not have the fossil or its pictures, thus we cannot confirm whether it represents that species, or *Periploca кryshtofovichii.*

CONCLUSION

Based on comparisons between fossil and recent leaf material we claim that the fossil material of Konjaroff (1932), as well as a part of that of by Palamarev & Petkova (1994) belong to the species *P. kryshtofovichii* and more exactly to its Balkan variety - *Periploca* cf. *kryshtofovichii*, which has been recognized also in another finding, in the Rhodopes Mts. (Bozukov et al. 2008) (Pl. I, Fig. 18).

A part of the fossil material determined as *Eugenia splendens* by Palamarev and Petkova (1994) from the sediments of Hvoina Graben belongs indeed to this fossil species. As far as *Eugenia splendens* occurrence in the Souhostrel Formation is concerned, the question remains open given the similarity with *Periploca* cf. *kryshtofovichii*, a species which was determined by Palamarev & Petkova (1975) in Padesh Graben too.

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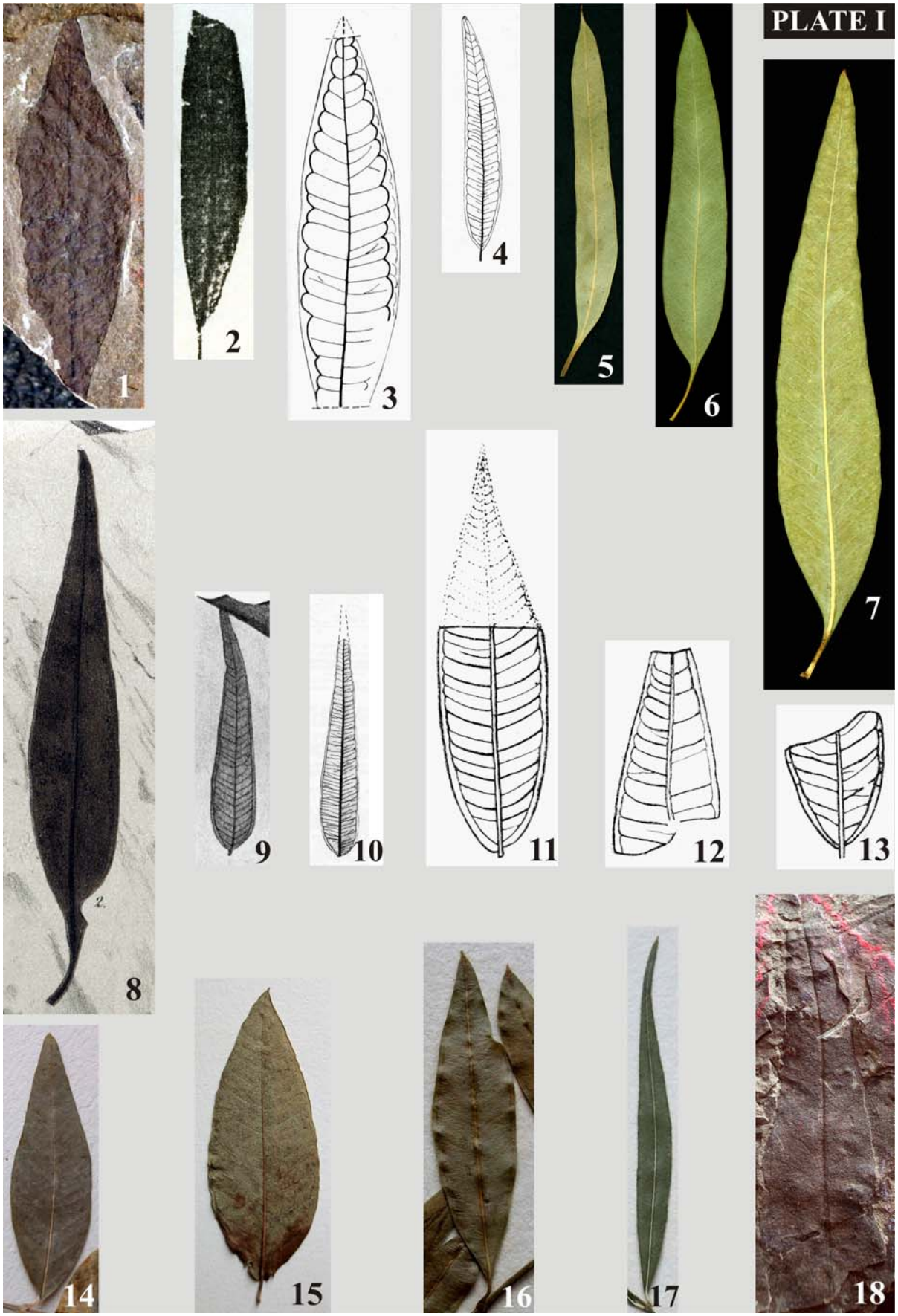
PLATE CAPTION

Plate I

Fig. 1 - *Eugenia splendens*, Pavelsko village, SmP-170a (x2);
Fig. 2 - *E. splendens*, Orehovo village, after Palamarev & Petkova (1994, Pl. III, Fig. 5) (x1);
Fig. 3 - *E. splendens*, after Petrescu et al. (1976, Pl. II, Fig. 7) (x1);
Fig. 4 – *E. splendens*, Orehovo village, after Palamarev & Petkova (1994, Pl. I, Fig. 3), revised as *Periploca* cf. *kryshtofovichii* (hoc loco) (x1);
Fig. 5 – *Eucalyptus globules*, Greece, CDPPA (x1);
Fig. 6 – *E. rostrata*, Albania, CDPPA (x0.5);
Fig. 7 – *E. resinifera*, Geogia, CDPPA (x1);
Fig. 8 – *E. oceanica* after Unger (1850, Pl. 36, Fig. 2) (x1);
Fig. 9 – *E. oceanica* after Konjaroff (1932, Pl. XLIII, Fig. 5), revised as *Periploca* cf. *kryshtofovichii* (hoc loco) (x1);
Fig. 10 – *Periploca* cf. *kryshtofovichii* after Palamarev & Petkova (1975, Pl. I, Fig. 5) (x1);
Fig. 11 – *P. kryshtofovichii* after Kornilova (1960, Pl. VIII, Fig. 6) (x1);
Fig. 12 – *P. kryshtofovichii* after Kornilova (1960, Pl. VIII, Fig. 8) (x1);
Fig. 13 – *P. kryshtofovichii* after Kornilova (1960, Pl. VIII, Fig. 9) (x1);
Fig. 14 – *P. sepium,* China, SOM No 91232 (x1);
Fig. 15 – *P. graeca,* Bulgaria, SOM No 137178 (x1);
Fig. 16 – *P. callophylla* China, SOM No 98951 (x1);
Fig. 17 – *P. forrestii,* China, SOM No 98929 (x1);
Fig. 18 – *Periploca* cf. *kryshtofovichii* after Bozukov et al. (2008, Pl. IV, Fig. 7) (x2).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