# Daphne kosaninii (Thymelaeaceae) in the Balkan Peninsula

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**Abstract.** Daphne kosaninii (Thymelaeaceae) was described from the Slavyanka Mt and Pirin Mts in SW Bulgaria. It is reported as also occurring in Kosovo, Greece and North Macedonia. The species is characterized by glabrous leaves and reddish-pink pubescent flowers. Two morphotypes can be recognized, one with patent-spreading perianth lobes and the other with erect perianth lobes. Daphne kosaninii f. kosaninii is defined as the typical form with patent-spreading perianth lobes; it occurs in Bulgaria, Greece and North Macedonia. Daphne sojakii described from Mt Vermion in north central Greece is synonymous with it. Daphne kosaninii f. cleistogama is the variant with erect perianth lobes held closely together so that the flowers appear cleistogamous. Daphne domini described from the area of Mt Orelek in SW Bulgaria is a synonym. This is the most common form in the mountains of northern Greece. The two forms are geographically separate, they never occur together in the same locality.

Daphne velenovskyi described from Pirin Mts (SW Bulgaria) is considered synonymous with D. cneorum.

- Key words: Balkan endemics, Daphne, distribution, lectotypification and typification, new localities
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# Introduction

Daphne kosaninii (Stoj.) Stoj. is a small hardy evergreen shrub resembling *D. oleoides* Schreb. which is widely distributed in the Mediterranean area from Spain to East Anatolia, Lebanon and Syria. It was first treated as a variety of *D. oleoides* (Stojanoff 1924) and later raised to species rank (Stojanoff 1928). It can be distinguished from *D. oleoides* by its dark reddish-pink flowers and glabrous leaves. In *D. oleoides*  the perianth lobes are white to creamy white, acute or subacute, fully patent-spreading (rarely cleistogamous), and the leaves are hairy-pubescent beneath (Fig. 1). *Daphne oleoides* subsp. *sardoa* is an interesting recently described subspecies of *D. oleoides* occurring in the siliceous and limestone mountains of central Sardinia (Camarda & Raimondo 2023). It has reddish-purple mostly cleistogamous flowers with very short triangular perianth lobes less than half the length of the perianth tube, as well as pros-



Fig. 1. Daphne kosaninii (pink-flowered) and D. oleoides (white-flowered) growing together on Mt Pangeo, northeastern Greece.

trate-creeping flexible branches. It does not really fit into *Daphne oleoides* and perhaps should be treated as a separate species.

### **Material and methods**

The type description of *D. kosaninii* was based on two samples, one from Ali Botush (Slavyanka Mt) and one from Pirin Mts. These two may thus be considered syntypes (Fig. 2).

Bulgaria: summit of Ali Botuš [Slavyanka Mt, south of Pirin Mts], 2000 m, 10 July 1920, *N.A. Stojanoff* (K000900091!).

Slavyanka is a border mountain and known as Orvilos on the Greek side. The flowers on this sheet are with the perianth lobes held closely together, and the herbarium sheet marked *Isotype*, the handwriting pencilled in by the collector N.A. Stojanoff. Bulgaria: Pirin Mts, in rupestribus subalpinus, 5 July 1921, *Stojanoff* 861 (K000900092!).

This sample was collected nearly a year later, the exact locality was not stated on the label but a later collection in August 1921 by Stojanoff and Stefanoff indicated El Tepe, prior to 1942, the old name for Vihren peak on Pirin Mts. The flowers on this sheet are with spreading perianth lobes.

Both specimens had been examined by W.B. Turrill (Kew) and compared with type material of forms of *D. oleoides* held at Kew, and also with *D. jasminea* Sm. held at Oxford. The sample from Pirin with spreading perianth lobes had earlier and erroneously been named as *D. jasminea* (Stojanoff 1921; Stojanoff & Stefanoff 1921). The latter can be distinguished by its prostrate glabrous branches, small obtuse leaves and flowers in groups of 2-3. It occurs at fairly low altitudes in east-central and southern Greece whereas *D. kosaninii* is a mountain plant.

ROYAL BOTANIC GARDENS KEW ROYAL BOTANIC GARDENS KEW FLORA OF Bulgaria. No. 861. FLORA OF Bulgaria. No Name: Daphne devides Native Name: wat. Kottini ho MB.T Locality: W. Min var Ko-im supletibus subalpinis Habit, Colour, Uses, etc.: Locality: Ali-Botus Altitude: eumnit . S. W. R.k. Habit, Colour, Uses, etc.: \$ 2000 m. Collector: Dr Storanoff. Date: 5/EE/1921. Comm. W. B. Turrill. Collector: N. Storanov. Date: July 10. 1920. Comm. W. B. Turrill.

Fig. 2. Syntypes of Daphne kosaninii: from Ali Botush (right) and from Pirin Mts (left specimen).

### **Results and discussion**

In subsequent collections of *D. kosaninii* in the Balkan Peninsula two morphotypes were consistently noted, one with erect perianth lobes and the other with spreading perianth lobes. The plants are not very variable in habit (always erect), stem and leaf indumentum (always glabrous), or structure of inflorescence. The morphotypes are geographically separate and never found together. The original description of *D. kosaninii* does not mention whether the perianth lobes are erect or spreading as it was based on two different samples, each exhibiting the feature independently (Stojanoff 1924).

There are no major morphological differences between the plants with "open" flowers and those with cleistogamous flowers, so both should be considered as belonging to one species. Our choice of the form with open flowers as the "normal typical" one is explained as follows. Cleistogamous flowers are probably a "secondary" feature in relation to normal flowers. Cleistogamy facilitates self-pollination and seed formation, especially in unfavorable weather conditions at alpine habitats. However, from an evolutionary point of view, it is not beneficial to the species as it limits variation. The two forms are easily identified so we suggest that the one with open flowers be treated as f. kosaninii after designating a lectotype for the species, and the one with cleistogamous flowers even at the end of flowering be described as a new forma, f. cleistogama Kit Tan, Petrova & Ziel.

The geographical separation of the two forms is very interesting and deserves study by geneticists. In our opinion, the trait of cleistogamy with corresponding flower morphology is controlled by recessive (r) genes, so the cleistogamous plant is revealed only when it is homozygous (rr). Normal reproduction is probably determined by dominant (D) genes, so flowers with spreading perianth lobes may occur not only in homozygous (DD) but also in heterozygous (Dr) plants.

The cleistogamous plants (rr) indicated by red dots in Fig. 4 are probably homozygous and unless there is some exceptional mutation, there is little or no possibility of creating forms with open spreading perianth lobes. If some plants indicated by white stars are not only homozygous (DD) but also heterozygous (Dr), then theoretically (due to recombination), it is possible for a 'cleistogama' form to appear among them. Such a form will probably be found in the future.

#### **Description of species**

*Daphne kosaninii* (Stoj.) Stoj. in Spis. Balg. Akad. Nauk 37: 137 (1928).

Basionym: *Daphne oleoides* var. *kosaninii* Stoj. in God. Sofiisk. Univ. Sofia Agron. Fak. 5: 139 (1924).

Lectotype (designated here by Kit Tan, Petrova & Ziel.): Bulgaria: Pirin Mts, in rupestribus subalpinis, 5 July 1921, *N.A. Stojanoff* 861 (K000900092!). A duplicate specimen in SO, SOM or SOA could not be located.

Syn.: *Daphne sojakii* Halda in Acta Mus. Richnov., Sect. Nat. 8(1): 34 (2001) – Graecia septentrionalis, Thessalia, Mt Vermion, in declivibus petrosis, solo calcareo, *ca*. 1650 m, 3 June 1987, *J.J. & J. Haldovi* no. 8706315 (holotype herb. Halda).

Daphne vermionica nom. nud.

Small shrub 0.5-1.5 m tall. Bark greyish, with vertical fissures. Branches erect, smooth, often reddish-brown, almost glabrous. Leaves oblong-spathulate to obovate-spathulate,  $9-20 \times 3-6$  mm, acute, attenuate at base, coriaceous, glabrous on both surfaces, green or glaucous. Flowers terminal, in fascicles of 3-7. Perianth tube pink to dark reddish-pink, adpressed-sericeous pubescent or sparsely pubescent; perianth lobes equalling or longer than half length of tube, acute to subacute, glabrous or pubescent.

#### Eponymy

Named after Prof. Nikolai Košanin (Belgrade) who was the first to note that the species differed significantly from *D. oleoides*.

Two forms are noted, the differences are presented in the key below:

1. Perianth lobes patent-spreading, white within
f. kosaninii
- Perianth lobes ± erect, held closely together, pink or
pale pink within
f. <i>cleistogama</i> Kit Tan, Petrova & Ziel.

Daphne kosaninii (Stoj.) Stoj. f. kosaninii (Figs. 3A & 4)

Stony and rocky limestone slopes, among junipers or clearings in *Fagus* woodland, 1450-2450 m. Flowering late May to mid-July. In Greece only reported from Mt Vermio in North Central, from the same locality as the type of *D. sojakii* Halda. The location on Suva Gora, North Macedonia is *ca*. 200 km west of the occurrence in Bulgaria.

#### Locality records

#### Bulgaria

Mt Pirin, El Tepe (Vihren peak), August 1921, Stoyanoff & Stefanoff s.n. (SOA 7846); loc. Kabata, 2450 m, 01 August 1930, leg. N. Phenenko, det. N. Stojanoff (SOM 53788); Vichren peak, between shrubs of Juniperus, 2100 m, 08 July 1959, B. Zhelezova (SOM 138213).

#### Greece

Nomos Imathias, Eparchia Naousis: Mt Vermio, track from Pigadia to summit, limestone boulders amongst juniper, 1760 m, 40°39'N, 21°57'E, 25 June 1999, flowering, *Richards* 99/100 (RNG); track from Pigadia, clearing in *Fagus* woodland, 1765 m, 40°39'N, 21°57'E, 26 August 1999, *Richards* 99/410 (RNG); Mt Vermio, ann. 2011, *J. Flohe* obs. (photos).

#### North Macedonia

Suva Gora, 22 May 2012, 26 May 2015, 30 May 2016 & 25 May 2020, *V. Pilous* obs. (several photos); *loc. ibid.*, on marble, 1450–1600 m, ann. 1973 & 1974, *H. Em* (Em1976); Jakupica massif, south of Skopje, *fide* Jovanović & al. (1975).

*Daphne kosaninii* f. *cleistogama* Kit Tan, Petrova & Ziel., f. **nova** (Figs. 3B & 4)

Type (designated here by Kit Tan, Petrova & Ziel.):

Bulgaria: summit of Ali Botuš [Slavyanka Mt, Tsarev peak], 1800-2000 m, 10 July 1920, *N.A. Stojanoff* s.n. (holotype SOA 7843! isotype K000900091!]

Syn.: *Daphne domini* Halda in Acta Mus. Richnov., Sect. Nat. 8 (1): 32 (2001) – Bulgaria austro-occidentalis, Montes Pirinus australis, Mt Orelek in prato sicco, solo calcareo, 2200 m, 28 June 1967, *J.J. Halda* no. 6706315 (holotype herb. Halda).

*Daphne domini* was described by Halda (2001) from area of Mt Orelek (Pirin Mts). There are no taxonomic features distinguishing it from *D. kosaninii* f. *cleistogama*.

Stony and deforested limestone slopes and dry meadows with *Juniperus communis* and rocky marble outcrops, 1047-2200 m. Flowering late June to early August. Rare in northeastern Greece, reported from Mts Agistro, Pangeo, Beles and Menikio. The record from Mt Agistro is new for Greece and is at the lowest altitude for the species. It is interesting to note that in NE Greece many high altitude plants come down to low altitudes at Agistro, e.g., *Convolvulus boissieri* subsp. *suendermannii, Centaurea parilica, Lomelosia rhodopensis.* 

#### Locality records

#### Bulgaria

Mt Belasitsa, Ambaro, stony places on mountain ridge, 1770 m, 41°33'N, 23°03'E, flowering, 20 June 2013, *S. Stoyanov & L. Topalova-Rzerzycha* (SOM 169792); Pirin Mts: in saxosis calcareis Orelova skala (Orelek), 2000-2090 m, 18 July 1936, *B. Achtarov* (SOM 53846); on the limestone slopes of Orelek, 2000 m, 06 July, *B. Kitanov & D. Stoyanov* (SO 90736); Slavyanka Mt (Ali Botush): on dry and shady rocky places, 1400-1800 m, 20 June 1929, *A.K. Drenovsky* (SOM 53790) and 23 June 1929 (SO 52603); loc. Parilski Dol, above village Paril, 23 June 1923, *N. Stoyanoff* (SOA 7844), sub *D. jasminea*; Gotsev peak, rocky marble places, 25 June 1969, *P. Vassilev & V. Velchev* (SOM 154362).

#### Greece

Nomos Serron, Eparchia Sintikis: Mt Beles (Belasica, Kerkini), NE of the village of Ano Poroia, along



Fig. 3. A, *Daphne kosaninii* f. *kosaninii* from Suva Gora, North Macedonia; B, *Daphne kosaninii* f. *cleistogama* from Mt Menikio, northeastern Greece.





the ridge west of the highest summit, 1650-1800 m, 41°19'N, 23°05'E, 2 August 1979, *Strid & al.* 16145 (AAU, C).

Nomos Serron, Eparchia Sintikis: Mt Agistro, grassy slope with rocky limestone outcrops at summit of Conoides peak, 1047 m, 41°20'N, 23°28'E, 22 May 2024, *Sister Pachomia & al.* s.n. (herb. Kit, Monastery of Timios Prodromos, Serres).

Nomos & Eparchia Serron: Mt Menikio, stony limestone slopes NW of Mikropoli, abundant, 1449 m, 41°09'N, 23°44'E, 28 May 2024, *Sister Pachomia* & *al.* obs. (photos); summit area, 1850-1960 m, 41°11'N, 23°44'E, 6 July 1981, *Strid* & *al.* 18681 (ATH, B, C, G); Boz Dagh of Serrai (Mt Menikio), precipices south of Karpa, 19-20 June1955, *Goulimis* 22109 (ATH). Karpa at 1903 m is the second highest peak of Menikio; Goulimis (1956:17) thus refers to Mt Menikio, not to Mt Falakro (Boz Dagh of Drama).

Nomos Kavalas, Eparchia Pangeo: Mt Pangeo, stony limestone slopes on peak 'Avgo', junction of road to summit, 1623 m, 40°54'N, 24°10'E, 22 June 2023, *Sister Pachomia & al.* s.n. (Monastery of Timios Prodromos, Serres); Pangeon ski station, 1600 m, 40°54'N, 24°07'E, 26 June 1992, *Willing* 20310 (B); In monte Pangeon (Purnar-Dagh), in saxosis substr. calc., 1700 m, 26 June 1936, *Rechinger* 10266 (LD); summit area, alpine meadows and rocky limestone slopes, 1900-1950 m, 40°54'N, 24°06'E, 9 July 1979,



Fig. 5. Daphne velenovskyi from Pirin Mts, SW Bulgaria.

*Strid* 722 (C); *loc. ibid.*, *Strid* 724 (herb. Strid); calcareous rocks near summit, 1600–1800 m, 40°54'N, 24°05'E, 14 July 1973, *Nordenstam* 6471b (C).

#### Kosovo

Occurrence in Kosovo was based on a report from Mt Pashtrik (Mustafa & al. 2015). It has never been confirmed and is possibly a misidentification for Daphne cneorum L. which occurs on the nearby mountains of Koritnik and Gjallica but has not been found recently in the Pashtrik Mts (Barina & al. 2017). L. Shuka has visited Mt Pashtrik on several occasions and has never found D. kosaninii or any pink-flowered variant of D. oleoides. Halda (1981) described two new species of Daphne, D. skipetarum Halda from Central Albania and D. velenovskyi Halda from an altitude of 1800-2600 m on Mt Vihren (Pirin Mts) in SW Bulgaria. The former turned out to be Plocama calabrica (L.f.) M. Backlund & Thulin (syn. Putoria calabrica (L.f.) DC., see Tan, Kit, 2017). There are no taxonomic differences between D. velenovskyi from the cirque of Vihren (Fig. 5) and D. cneorum so the former is considered a synonym of the latter. It is possible that the Pashtrik report of D. kosaninii is erroneous and it is represented in Fig. 4 with an eroteme.

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