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## Distribution of species from the genus *Betula* L. in Turkey, Iran and Iraq\*

The first information about the occurrence of birches in Turkey dates back to the second half of the XIXth c. In 1866 Tchihatcheff mentions this genus, referring only very generally, when he says that *B. pendula* Roth. grows in Armenia to elevation of 1786 - 2662 m. Seven years later Trautvetter (1873) mentions the first stand from the Ağrı dağı massif, and it is from this region that we have most of the data in later literature. Boissier (1873) knew already 3 stands of *B. pendula*: Çimil, Erciyas dağı (after Balansa) and Bingöl dağı. (according to Kotschy), however he does not mention the stand of Trautvetter. For some time afterwards the knowledge of the subject did not increase until Krause (1930) summarized all the data on Turkish birches known at the time. Besides *B. pendula* he mentions also another species — *B. pubescens* Ehrh. with two stands in northeastern Anatolia.

However the occurrence of this latter species in Turkey has not been confirmed since, and it seems more than doubtful. Probably the information of Krause concerns a different species, though closely related to *B. pubescens*, namely *B. litinowii* Doluch. A clarification of this question requires a study of the systematics and geographical distribution of birches in the regions of the Caucasus neighbouring with Turkey, since the ranges of birches in these two regions are closely associated.

On the question of the occurrence of *B. pubescens* on the Caucasus there is a long standing dispute among botanists in the Soviet Union and to be exact even till this day the question has not been settled definitely. In 1939 Doluchanov, who has described for the Caucasus a new species of birch, the above mentioned *B. litwinowii*, claimed categorically that the typical *B. pubescens* does not exist in the region. This opinion he has reaffirmed once again 20 years later (Doluchanov, 1961). It was shared by Grossheim (1949). However Vassiljev (1951) is of a different opinion. He claims that *B. pubescens* (which he calls in his work *B. alba* L.) „[...] distributed in the Caucasus primarily along

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the main range, reaching southern Osetia, but never going below 1500 m elevation". Recently also Mulkidjanian (1962) mentions *B. pubescens* from Armenia (besides *B. pendula* and *B. litwinowii*), and he underlines that this birch occurs scattered in the Caucasus.

I have had the opportunity of seeing the rich herbarium collections of Caucasian birches in the Herbarium of the Leningrad Botanical Institute. I have not found a single specimen among them which could be included in *B. pubescens*. The birch *B. litwinowii* described by Doluchanov is quite similar to *B. pubescens*, it has similarly pubescent young shoots and young leaves as well as tufts of hairs in the vein crotches on the lower leaf surface. However it differs distinctly in having characteristic resin glands on the shoots, occurring sometimes even in large numbers. It appears therefore that the misunderstanding arises from the relatively large variability of *P. litwinowii* itself and the occurrence of spontaneous hybrids with *B. pendula*. According to Doluchanov (1961) both these birches occur close to each other forming in places a common stratum of birch forests at an elevation of 1500 - 2200 m.

On the basis of the above conclusions one can assume, with great probability, that the typical *B. pubescens* does not occur, neither on the Caucasus nor in Anatolia.

Presently there grow 5 species of birches in Turkey or more strictly in eastern Anatolia. These are birches from two sections — *Costatae* (Rgl.) Koehne and *Betula*.

Species from the former section are distributed primarily in eastern and central Asia (Himalayas) and in North America. On the Caucasus there occur only *B. raddeana* Trautv. and *B. medwedewii* Rgl. The disjunction separating their range from the ranges of other species in sections *Costatae* (*B. jacquemontii* Spach in eastern Afghanistan) is over 2000 km in a straight line. Both these species are considered as tertiary relicts (Vassiljev, 1951).

*B. medwedewii* is known in Turkey from only a few stands (Fig. 1), situated at 1300 - 2160 m elevation, while in the Transcaucasus, where the major part of the range of this species is located, it grows from 800 m elevation in deep gorges, to 2300 m, usually however above 1500 m. It is a small tree with a procumbent and readily rooting stem. At the upper limit of its distribution the tree reaches only 2 - 2.5 m in height. As a rule it forms pure thickets or appears together with other species of trees and shrubs, such as *Quercus pontica*, *Sorbus subfusca*, *Rhododendron caucasicum*, *Laurocerasus officinalis*, *Ilex aquifolium*, *Vaccinium arctostaphylos* and others.

Sosnovsky (1934) has separated out from *B. medwedewii* a new species under the name *B. megrelica* Sosn., which was to differ in having smaller and more narrow leaves, and a slightly different form of fruits scales. However these characters are of so small a significance, that

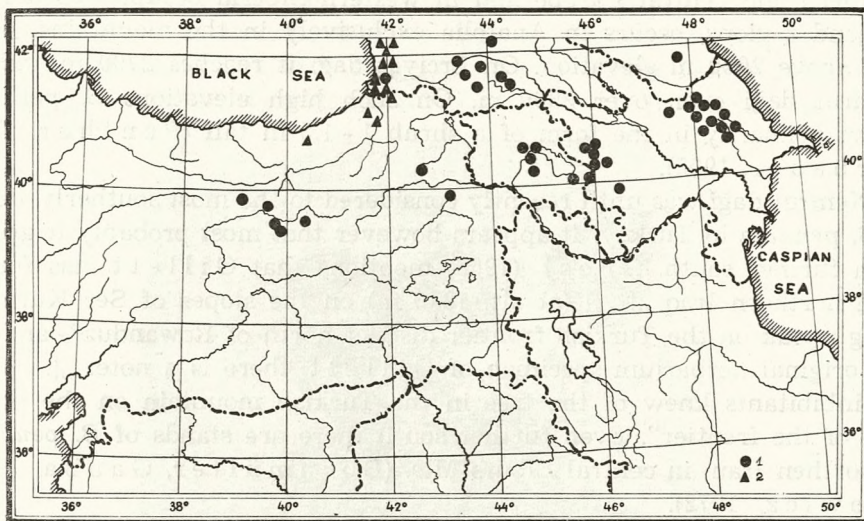


Fig. 1. The distribution of *Betula litwinowii* (1) and *B. medwedewii* (2). (On the Caucasus acc. to Grossheim, 1939 and Vassiljev, 1951)

Vassiljev (1951) has decided to consider *B. megrelica* as being a species identical to *B. medwedewii*, and has included the former name among the synonyms of the latter.

Among the birches of section *Betula* the most commonly found one in Anatolia is *B. pendula*, which however occurs only on scattered frequently widely distributed stands (Fig. 2). This boreal species, which in

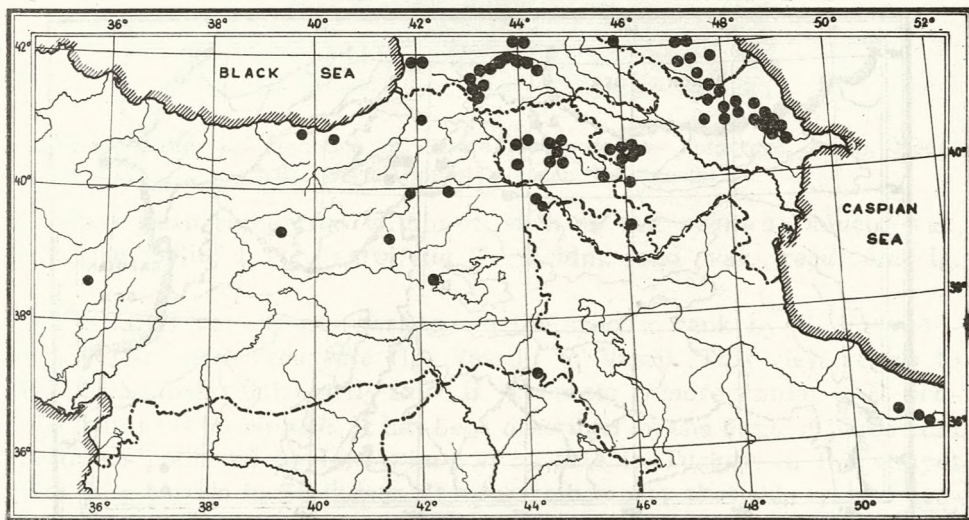


Fig. 2. The distribution of *Betula pendula* (On the Caucasus acc. to Grossheim, 1939)

northern and central Europe and in western Siberia occupies as a rule lowland regions, occurs in Anatolia exclusively in the mountains, usually above 2000 m elevation. On Erciyas dağı it reaches 2700 m and in Nemrut dağı even over 3000 m. On such high elevations *B. pendula* grows primarily in the form of a shrub 1 - 1.5 m tall (Penther, Zederbauer, 1905).

Nemrut dağı was until recently considered to the most southerly stand of *B. pendula* in Turkey. It appears however that most probably it grows even further south. Guest (1966) mentions that Gillett has found it in northern Iraq „[...] (at alt. 1840 m) on the slopes of Ser Kurawa, a high peak on the Turkish frontier district north of Rowanduz”, and on the original herbarium specimen of Gillett there is a note: „[...] local inhabitants knew of the tree in the Turkish mountain on the other side of the frontier”. Even further south there are stands of *B. pendula* in northern Iran, in central Elburs Mts. (Bornmüller, Gauba, 1939; Browicz, 1972).

*B. pendula* has been also reported from Rumelia, from Cendere by Rechinger (1938) and it is probably on this basis that Walters (1964) has included Turkey in the European range of the species. According to Webb (1966) this information probably concerns only cultivated trees. In Anatolia and on the Balkan peninsula *B. pendula* grows primarily in the mountains, while the stand in Cendere was to have been at low altitude.

The second species from the section *Betula* is *B. litwinowii*. Its range in Anatolia is more restricted than the range of *B. pendula*, and the stands are agglomerated primarily in the vilayets Erzincan, Tunceli et Kars, at

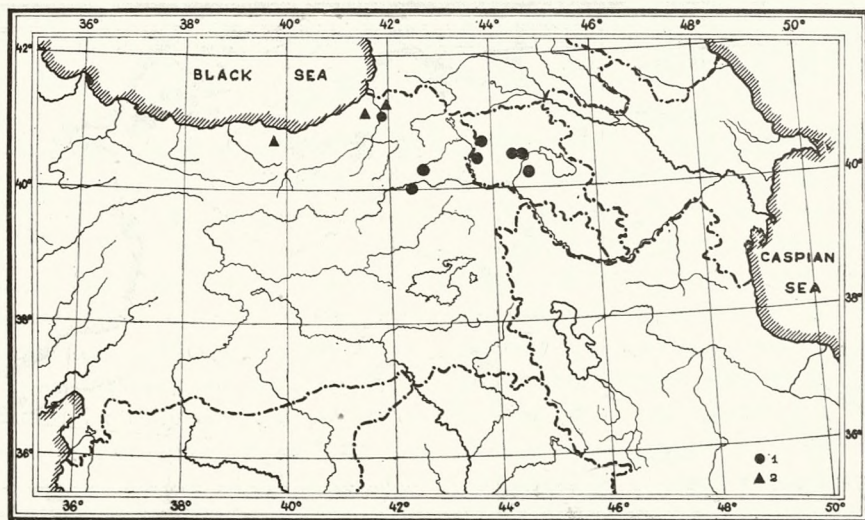


Fig. 3. The distribution of *Betula recurvata* (1) and *B. lazistanica* (2). (On the Caucasus acc. to Vassiljev, 1951)

1600 - 2500 m elevation (Fig. 1). The major part of the range is on the Caucasus, where *B. litwinowii* is the most common birch species, both in Greater and Lesser Caucasus ranges. It is only absent in the Talish Mts. and in the valley of river Araks (Doluchanov, 1961). Several varie-



Phot. K. Jakusz

Fig. 4. A herbarium specimen of *Betula lazistanica* — holotypus, Davis, Hedge 29921 (Royal Botanic Garden, Edinburgh)

ties have been recognized within it, such as var. *svanica* Doluch., var. *abchasica* Doluch., var. *parvifolia* T. Heidm. and var. *recurvata* Ig. Vassil.

The latter variety has been given the specific rank by V. Vassiljev (1966), as *B. recurvata* (Ig. Vassil.) V. Vassil. This view seems to be full justified, particularly since *B. recurvata* is more similar to *B. pendula* than to *B. litwinowii*. It has been described on the basis of herbarium specimens collected by Litwinow in 1914 in Turkey, in the vilayet Kars, in a garden in Sarikanus. It appears however that this species grows also wild in the western part of Lesser Caucasus and in Turkey in the vilayets Coruh and Kars (Fig. 3). *B. recurvata* is however still rather little known and requires further critical study.

Finally the fifth Turkish birch species is the endemic *B. lazistanica* (Fig. 4). I have separated it out on the basis of two herbarium specimens, described initially as *B. pubescens* (Browicz, 1973). It cannot be identified with that species because it has larger leaves and lacks the tufts of hairs in the vein crotches on the lower leaf surface, which is a very important and characteristic feature of *B. pubescens*. Unfortunately the herbarium specimens which I have seen have been collected in the sterile condition, and therefore it is difficult to say with which species of birch *B. lazistanica* is most closely related. So far it is known to exist only in vilayet Coruh and Trabzon, at an elevation of 1300 - 1950 m (Fig. 3).

Besides the species of birches mentioned above Vassiljev (1961) reports also from Turkey, from vilayet Kars, one other species namely *B. microlepis* Ig. Vassil. The range of this birch coincides with that of *B. pendula*, and its characters fall readily within the variability of that species. Thus *B. microlepis* should be considered among the synonyms of *B. pendula*. It was treated in this way also by Doluchanov (1961).

## LOCALITIES

### 1. *B. MEDWEDEWII* RGL.

**Turkey.** Herbarium specimens: Vartar Jailassi, Rice, Lazistan, 6600', 9.8.1934, Balls 1957 (E.K.); Çoruh (Artvin) Şaaval Tepe above Murgul (igneous), 1560 m, 14.8.1957, Davis, Hedge 32343 (E.K.); Çoruh: Hatila Ormani, Rakim, 1300 m, 1949, S. Avcı 39 (E.ISTO.); Çoruh Borçka, Karagöl Macahel yolu, 2100 m, 8.1965. K. Aydın (ISTO 4317) Fontes fl. Murghul-su ad İaila Egre-su. Prov. Batumi, distr. Artvin, 7.6.1914, Schmidt 98 (K.); Artvin, Hatila dere, 1960, F. Zednik (W.); In den Richtung des Weges von Sallet Tepe bis zu Hatila in der Umgebung Hanzat-Düzü und Basilia Tepe, 1949, Abdulgafur Acatay (W.).

### 2. *B. PENDULA* ROTH.

**Turkey.** Herbarium specimens: Bitlis: Nemrut Da., 10.000', 7.1966, Tong 176 (E.); Crater of Nemrut Dagh, 2400 m, 11.8.1956, McNeill 560 (E.K.); Nemrut Dagh, 7600', 3.7.1954, Davis, Polunin 23506, 23532 (E.K.); Nemrut dagı, Krater gölü kanarı, 3050 m, A Çelik (ISTO 2202); Crater of Nemrut Dagh, 1.8.1906, Post 690 (G.); Nemrut Krateri — Sicak göl civari, 30. 7. 1969, T. Odabaşı (ISTO 8671, 8672); Distr. Tatvan, Kirkor Da. igneous N. slope, mixed forest, ca. 2200 m, 18.7.1972, Peşmen (ANK.); Tunceli-Ovacık (Ovacık Bölgesi — Muznur Vadisi), 1300 m, 25.7.1969, T. Odabaşı (ISTO 8653); Tunceli-Ovacık (Muznur Nehri Menbal), 8.1963, Miraboğlu (ISTO 2876); Tunceli-Ovacık (Ovacık Mercan çayiri), 8.7.1969, A. Çelik (ISTO 8613); Artvin: Ardanuç (Ardanuç İşletmesi — Ovacık Bölgesi, Sakah-tutan dagh), 2230 m, 2.9.1968, M. Inaç (ISTO 7808); Kars: gorge near station Promežutočnoje, 1.7.1914, Litwinow (L.E.); Kars: W side of Küçük Agri Dag, 2500 m, 27.5.1966, Davis 43790 (E.K.); Kars: Aralık, Küçük Agri Dagı near Serdar Bulak, 2300 m, 20.7.1966,

Davis 46918 (E.ISTO.K.); Sardar Bulakh, 10.7.1910, Post 2069 (G.); Agri: 15 km from Eleskirt to Horasan, E of Tahir pass, 2200 m, 24.7.1966, Davis 47145 (E.ISTO.K.); Erzerum: River Araks, 27 wersts above Jagan, in the mountain, 9.7.1916, Sposochnikov, Schischkin (L.E.); Prov. Musch, ad radices austr. Bimgoell montis ad Gumgum in distr. Wardo. In humidis ad Lacum Gestemert alt 5200', 26.8.1859, Kotschy 420 (K.). Prov. Gümüşane, between Bayburt and Aşkale. Kop. dağl. pass, ca. 2350 m, near stream 19.5.1975, Browicz, Zieliński (Kórnik).

**Literature:** Nemrut dağı, nordexponierte Innenseite des Kraterandes, 2500 m (Rechinger, 1952); In regione alpina Argaei, Balansa (Boissier, 1879, Krause, 1930); Erdschias Dag: Zwischen Felsen des Pelikartyn, 2300 - 2700 m; Kartyn, 2200 - 2500 m; Lifos, 2400 m; Karasivri, 1800 m (Penther, Zederbauer, 1905); Kayseri: Erciyas, Selmiye Gartum, ca. 2800 m, 7.1944, H. Bagda (Birand, 1952); In Armenia, in monte Ararat minore, ad fontes Sardar-bulak (Trautvetter, 1873); Nur unterhalb des Sattels zwischen den Grossen und den Kleinen Ararat, 2200 - 2400 m (Krause, 1914); Ararat, Engler u. Krause 632 (Krause, 1930); Pontus Lasicus, supra Djimil, 6400', Balansa (Boissier, 1879; Krause, 1930); Değirman-Tal, ca. 2100 m (Schiechtel, Stern, Weiss, 1965); Environs de Sardar-Boulakh (exs. 2069). Arbres d'environ 2 m 50 de haut, formant un petit bois au pied de Petit Ararat (Aznavour, 1918).

**Iran.** Herbarium specimens: Mt. Demavend, ca. 9000', 7.1894, Glazunov (L.E.); Prov. Kazvin: Montes Elburs centr. in valle Oshtorak ditionis jugi Kandavan, Gauba, Sabeti 1863 (W.); Tehran: Montes Elburs centr., Shahrestanek, 2300 m. Gauba 1864 (W.); Valleys near the Keres river, 6000 - 7000', 7.8.1935, Trott 354 (K.). Shahrestank, This visheh, 2500 m, 18.7.1972, Riazi 4182 (Ariamehr Bot. Gard.).

**Literature:** Elburs, im Oschtarak-Tal, an Bachufer, 2.9.1934, Bornmüller 1102 (Bornmüller, Gauba, 1939); Totschal, near the castel of shah (Bornmüller, Gauba, 1939).

**Iraq.** Herbarium specimens: Between Zari and Zerwa, S. of Ser Kurawa, 1840 m, Gillett 9795 (K.).

### 3. *B. LITWINOWII* DOLUCH.

**Turkey.** Herbarium specimens: Prov. Tunceli: Pülümür — Selepur, 1950 m, 23.7.1957, Davis, Hedge 31591 (E.K.); Prov. Erzincan: foot of Kesis dag, above Cimin, 2500 m, 2.7.1956, Davis, Hedge 31699 (E.K.); Tunceli: Pülümür (Pülümür-Seteri Ormani), 15.8.1966, Enver Erbek (ISTO 7597); Reg. Kars, between Sarykamysch and Chan-Dar, 14.6.1919, Litwinow (L.E.); Prov. Kars. opp. Sarykamysch, in horto, 18.6.1914, Litwinow (K. L.E.); Erzincan: Tercan (Ortakom Köyü — Cambaba Tepesi), 2000 m, 15.7.1955, Yaltirik (ISTO 818); Erzincan: Refahiye (Dumanli Orman Bölge Şetligi, Açıkta) 28.8.1966, Urhan Yildirim (ISTO 5744); Kars: Mountains E of Kagızman, 7 km from Akçay to Çumaçay, 1600 m, 17.7.1966, Davis 46815 (E.ISTO.K.); Reg. Kars, forest district Saganlugskoje, 1911, Zubkov (L.E.). Prov. Gümüşane, between Bayburt and Aşkale, S. of the village Kop, near river, 19.5.1975, Browicz, Zieliński (Kórnik); Prov. Erzincan, between Refahiye and Altköy (ca. 2 km S of Altköy), on the slopes over stream, ca. 1600 m, 12.6.1975, Browicz, Zieliński (Kórnik).

### 4. *B. RECURVATA* (IG. VASSIL.) V. VASSIL.

**Turkey.** Herbarium specimens: Çoruh, Hatila ormani, 1300 m, 1949, S. Avaci (ISTO 38); Prov. Kars: pag. Karaklis, 24.6.1913, Litwinow (E.K.).

**Literature:** Prov. Kars, opp. Sary-Kamysch, in horto, 17.4.1914, Litwinow (Vassiljev, 1951).

## 5. B. LAZISTANICA BROWICZ

**Turkey.** Herbarium specimens: Trabzon-Maçka-Meryemana, A. O. Ka-raagac, 1950 m, 19.7.1973, R. Anşin 681 (ISTO.); Prov. Çoruh (Artvin), Tiryal dag above Murgul, 1700 m, *Rhododendron* scrub, 23.6.1956, Davis, Hedge 29921 (E.K.); Prov. Çoruh: mountain above Artvin (igneous), 1300 m, 19.6.1957, Davis, Hedge 29737 (E.K.).

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KAZIMIERZ BROWICZ

*Rozmieszczenie gatunków z rodzaju Betula L. w Turcji, Iranie i w Iraku*

## Streszczenie

Na podstawie zbiorów zielnikowych oraz literatury autor zestawił dane o stanowiskach brzoź oraz sporządził punktowe mapy ich rozmieszczenia w Turcji, Iranie i w Iraku. W tych dwóch ostatnich krajach występuje tylko jeden gatunek — *B. pendula* Roth i to zaledwie na kilku stanowiskach: w północnym Iraku na pograniczu z Turcją oraz w północnym Iranie, w górach Elburs.

W Turcji rośnie obecnie 5 gatunków brzoź, z dwóch sekcji — *Costatae* i *Betula*. Z pierwszej sekcji znana jest tu tylko *B. medwedewii* Rgl., relikw trzeciorzędowy, pojawiająca się w górach północno-wschodniej Anatolii, na wysokości 1300 - 2160 m n.p.m.

Z sekcji *Betula* najczęstszym gatunkiem jest *B. pendula*, która jednakże występuje tylko na rozproszonych, znacznie od siebie oddalonych stanowiskach, wyłącznie w górach, od 1300 - 3050 m n.p.m. Nieco rzadsza jest *B. litwinowii* Doluch. Gatunek ten pospolity na Kaukazie rośnie w północno-wschodniej Anatolii w wilajetach Erzincan, Tunceli i Kars, na wysokości 1600 - 2500 m n.p.m. *B. litwinowii* jest dosyć podobna do *B. pubescens*, od której różni się przede wszystkim pędami owłosionymi, lecz pokrytymi w większym lub mniejszym stopniu żywicznymi gruczołkami. *B. pubescens* w Turcji nie występuje, a jej obecność na Kaukazie poddawana jest krytyce.

Dwa ostatnie gatunki są jeszcze mało poznane i wymagają dalszych studiów — są, to: *B. recurvata* (Ig. Vassil.) V. Vassil. znana z kilku stanowisk w wilajecie Çoruh i Kars oraz wyodrębniona przez autora *B. lazistanica* Browicz z wilajetu Trabzon i Çoruh (1300 - 1950 m n.p.m.).

КАЗИМЕЖ БРОВИЧ

*Размещение видов рода Betula L. в Турции, Иране и Ираке*

## Резюме

На основе гербарных сборов и литературных материалов автор свел вместе данные о местонахождениях берез и составил точечные карты их распространения в Турции, Иране и Ираке. В двух последних странах встречается только один вид *B. pendula* Roth., притом лишь на нескольких местонахождениях: в северном Ираке на границе с Турцией и в северном Иране, в горах Эльбурс.

В Турции в настоящее время произрастает пять видов берез из двух секций — *Costatae* и *Betula*. Из первой секции известен только один вид — *B. medwedewii*

Rgl., реликт третичного периода, встречающийся в горах северо-восточной Анатолии, на высотах 1300 - 2160 м над ур. м.

В секции *Betula* наиболее распространенным видом является *B. pendula* Roth., которая однако встречается только на разбросанных и значительно друг от друга отдаленных местонахождениях, исключительно в горах, на высотах 1300 - 3050 м. Несколько более редкой является *B. litwinowii* Doluch. Вид этот, обычный на Кавказе, растет в северо-восточной Анатолии, в вилайетах Эрзинджан, Тунджели и Карс, на высоте 1600 - 2500 м над ур. м. *B. litwinowii* довольно сходна с *B. pubescens*, от которой отличается прежде всего побегими, опушенными или в большей или меньшей степени покрытыми смолистыми железками. *B. pubescens* в Турции не встречается, а ее нахождение на Кавказе подвергается критике.

Два остальных вида еще мало изучены и требуют дальнейших исследований. Это *B. recurvata* (Ig. Vassil.) V. Vassil, известная с нескольких местонахождений в вилайетах Чорум и Карс, и выделенная автором *B. lazistanica* Browicz, найденная в вилайетах Трабзон и Чорум (1300 - 1950 м над ур. м.).