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***Macrotomia bosbutooensis* (Boraginaceae), a new species from Kyrgyzstan**

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Summary. The paper provides a description of a new species of *Macrotomia* from section *Munbuya* from Kyrgyzstan (Western Tian Shan). Genus *Macrotomia* is a small group of species of the Boraginaceae family distributed from the Himalayas to Asia Minor and southern Europe (Greece). The exact number of species in the genus is unknown, due to the fact that a number of names are critical, and this taxon itself is often considered as a part of the genus *Arnebia*. The new species is close to *Macrotomia euchromos*, the most widespread species in Middle Asia, but differs from it in corolla color, as well as in its distribution in a lower mountain zone, an earlier flowering and fruiting time. According to our data, the new species is endemic to the Bosbu-Too Mountains (Western Tian Shan) but can be found on the adjacent Atoynok Mt. Ridge.

***Macrotomia bosbutooensis* (Boraginaceae) – новый вид из Кыргызстана**

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Ключевые слова: горы Бозбу-Тоо, Западный Тянь-Шань, лекарственное растение, секция *Munbuya*, *Macrotomia euchromos*.

Аннотация. Статья содержит описание нового вида *Macrotomia* (макротомия) из секции *Munbuya* из Кыргызстана. Род *Macrotomia* – немногочисленная группа видов из семейства Boraginaceae, распространённая от Гималаев до Малой Азии и южной Европы (Греция). Точное количество видов в роде неизвестно из-за того, что ряд названий являются критическими, а сам этот таксон часто рассматривается как часть рода *Arnebia*. Описываемый вид близок к наиболее распространённому в Средней Азии виду – *M. euchromos*, но отличается от него по цвету венчика, а также характером распространения в более низком поясе гор и более ранним временем цветения и плодоношения. Новый вид, по нашим данным, является эндемичным для гор Бозбу-Тоо (Западный Тянь-Шань), но может быть найден на сопредельном Атойнокском хребте.

Introduction

The genus *Macrotomia* DC. ex Meissn. is a small group of species from the Boraginaceae Juss. family, distributed from the South Asia (Afghanistan, Pakistan, West Himalayas) (*M. benthamii* (Wall. ex G. Don) DC. ex Meissn., *M. euchromos* (Royle ex Benth.) Paulsen, *M. inconspicua* (Hemsl. et Lace) Kitam.), Central Asia (Tibet, Xinjiang) (*M. euchromos*) and Middle Asia (Kazakhstan, Kirgizstan, Tadzhikistan, Uzbekistan (*M. cana* Tzvel., *M. euchromos*, *M. ugamensis* Popov) to the Asia Minor (Turkey), Caucasus and South Europe (Greece) (*M. densiflora* (Ledeb. ex Nordm.) J. F. Macbr) (Popov, 1953). Only the species accepted are listed (POWO, 2026). The exact number of species in the genus is unknown, due to the fact that a number of names are critical, and the taxon itself is often considered as a part of the genus *Arnebia* Forssk. (Kazmi, 1970; Zhu et al., 1995), sometimes at the sectional rank (Riedl, 1967). Unlike *Arnebia*, species of the genus *Macrotomia* has lack a hairy ring at the base of the flower tube as it indicated in the key to genera (Popov, 1953). In the “Keys for identification Middle Asian plants” (Zakirov, 1986), those genera in the key are also distinguished primarily by the presence or absence of a scaly nectary ring, all other diagnostic characters are more or less intermediate. S. V. Ovchinnikova (2022) in her treatment of the genus *Macrotomia* for the “Flora of Uzbekistan” includes only one of the two species previously assigned to this genus, while transferring another one to the genus *Arnebia*. As a result, the distinctions between the two genera in her circumscription become insufficiently clear. In the key to genera by Ovchinnikova, the following is stated:

“A scaly protective nectary ring is present inside at the base of the corolla tube. Corolla violet, pink, or yellow (often with violet spots) – *Arnebia*.

A scaly protective nectary ring is absent inside at the base of the corolla tube. Corolla wine-blue-red – *Macrotomia*.”

However, in *M. euchromos*, which she assigned to the genus *Arnebia*, the scaly protective nectary ring is absent.

During field expedition in 2021, new species of *Macrotomia* has been collected. It is close to the most widespread species in Middle Asia – *M. euchromos*. This species lacks a scaly nectary ring at the base of the floral tube. Therefore, it should belong to the *Macrotomia* section *Munbuya* (Boiss.) Popov but differs from its representatives in the color of flowers, as well as distribution in the lower mountain zone

and an earlier flowering time (at the May, not in June-August). Initially, the corolla of this species is pale yellow, then purple spots appear, which vanish to the end of flowering. By generally pale yellow flowers it resembles the flowers of annual species of the genus *Arnebia* or species from another section *Aepyanthus* (Stev.) Popov, which are common in the Caucasus and Asia Minor. Initially, we identified this species as *Macrotomia onosmoides* Regel et Smirn. (by name which means similar to *Onosma*), however, the last species was described from Kazakhstan, Dzungarian Alatau Ridge, and there is no evidence that these plants had a corolla similar to our species. Considering the presence or absence of the protective nectary ring to be a more important diagnostic character than corolla color, we place and describe this species in the genus *Macrotomia*. The new species, according to our data, is endemic to the Bosbu-Too Mountains (Western Tian Shan) but can be found on the adjacent Atoynok Mt. Ridge.

Despite intensive searches, the true *M. euchromos* has not been found here. Our species differs from the other middle Asian species, *M. ugamensis*, in having narrower leaves with a single prominent vein and a pale yellow corolla with violet spots vs. broader leaves, usually with three prominent veins, and a pinkish corolla that later becomes dark burgundy. The two species also differ in their distribution. Within Kyrgyzstan, *M. ugamensis* occurs only in the mountains surrounding the Chatkal Valley, and the ranges of the two species do not overlap. The roots of all species in the genus produce a reddish-purple color when cut and are used in Middle Asia as both a dye and a popular medicine. So, roots of *M. euchromos* in Kyrgyzstan are key component of many remedies used in traditional medicine for the treatment of digestive ailments, alleviate indigestion, bloating, as antiinflammatory and antimicrobial properties, eczema and dermatitis etc. Beyond its medicinal uses, *M. euchromos* finds its way into Kyrgyz cosmetics and is used as a natural dyes that impart a range of red and purple hues to textiles (Kazybekov et al., 2024). Currently, large quantities of *Macrotomia* root are harvested in Kyrgyzstan and exported to China, where it is widely used in traditional Chinese medicine. According to our observations, the new species is also harvested alongside *M. euchromos*. However, unlike the latter species, which has a wide range, this species is restricted to the small area, what, combined with its habitat in the lower mountain zone, may pose a threat to the stability of its populations.

Materials and methods

Herbarium materials of the genus *Macrotomia* and *Arnebia*, including type materials stored in the herbaria FRU, LE (<https://herbariumle.ru>), MW (<https://plant.depo.msu.ru>), TASH, as well as observation in nature were used. When identifying a new species, the classical morphologic-geographical method was used, based on the study of morphology superimposed on the distribution of taxa. In accordance with Article 39.2 of the International Code of Nomenclature for algae, fungi, and plants (ICN) (Turland et al., 2025), the description of the species is provided in English.

In describing the morphology of the species, we largely follow Ovchinnikova (2022).

Results and discussion

Macrotomia bosbutooensis Lazkov et Ganybaeva, **sp. nov.** (sect. *Munbuya* (Boiss.) Popov) (Fig. 1–2).

Description. Perennials. Taproot thick, up to 2 cm in diam., reddish-purple on cross section, caudex branched, at the top with leaves remnants, bearing elongated floriferous and shortened vegetative shoots. Leaves of vegetative shoots linear-lanceolate, 10–15 cm long, 0.5–1.3 cm wide, with a single central rib, pointed at the apex covered with patent short hairs and long bristles. Floriferous stems 15–35 cm high, covered with patent short hairs and long bristles, with lanceolate leaves in number 6–9. Bracteate leaves nearly linear, decreasing towards the top. Inflorescence multi-flowered, compressed, corymbose-capitate, composed of short cymes, in fruits more laxe. Calyx divided almost to base into sublinear sepals, 1.5–1.7 cm long, in fruits slightly lengthening to 1.8–2.1 cm, covered with patent short hairs and long bristles. Corolla pale yellow, 20–23 mm long, funnel-shaped, tube 15–18 mm long, outside covered with sparse hairs, inside glabrous, without scaly nectary ring, limb is sub wheel-shaped, 8–12 mm in diam., divided into semicircular lobes with a cordate violet spots. Flowers heterostylous. In one floral morph, the anthers are located within the corolla tube, while the style protrudes beyond it and bears a distinctly bifid stigma. In the other morph, the anthers are located in the throat of the flower, and the style is short, with an indistinctly bilobed stigma. Eremocarps 5 mm long, ovoid, whitish, wrinkled and slightly tubercu-

late on the surface, apically short pointed, dorsally with 3 weak longitudinal ridges, keeled ventrally.

Holotype: “Kyrgyzstan, Jalal-Abad region, Aksy district, Bosbu-Too Mts., Taldy-Bulak tract, between Kerben (Karavan) and Abyshev Pass., altitude 1995 m, N41.493333°, E71.830556°. 17 V 2021. G. A. Lazkov” (LE 01181436, iso – AA, FRU, LE, MW, TASH).

Affinity. *Macrotomia bosbutooensis* differs from *M. euchromos* by yellow with violet spots (vs. wine red, violet or pink) flowers, whitish vs. grayish eremocarps and isolated distribution area (Bosbu-Too Mts.), where last species is not known. From *M. ugamensis* this species differs in having one vs. 2–3 clearly visible underside vein on the basal and stem leaves, corolla color pale yellow, with a cordate violet spots vs. pinkish that later becomes dark burgundy and a separated distribution area in the Bosbu-Too Mts., while *M. ugamensis* in Kyrgyzstan is distributed only within the Chatkal Valley.

Paratypes: “Kyrgyzstan, Jalal-Abad region, Aksy district, Bosbu-Too Mts., Syny-Sai River Gorge, altitude 1487 m, N41.58438°, E72.01761°. 19 V 2021. G. A. Lazkov” (FRU); “Kyrgyzstan, Jalal-Abad region, Aksy district, Bosbu-Too Mts., near Bospiek vill., Archaly-Sai River Gorge, altitude 1543 m, N41.52503°, E71.84647°. 18 V 2021. G. A. Lazkov” (FRU).

Distribution. The species is distributed in Bosbu-Too Mts., adjacent to the Chatkal Mt. Ridge from the south. Its finding in close located Atoinok Mt. Ridge is also possible.

Habitat. The species grows in rocky habitats in the lower and lower middle mountain belts (1400–1900 meters above sea level), in open spaces among sparse, tall-stemmed juniper (*Juniperus seracschanicus* Kom.) (Fig. 3).

Biology. The flowering and fruiting season for this species typically begins in mid-May.

Etymology. The species was named after place of its growth – in the Bosbu-Too mountains.

The discovery of the species closely related to *M. euchromos* in Bosbu-Too Mts. shows that this species, on its wide distribution, may be divided into several smaller races occupying more narrow isolated areas.

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Fig. 1. *Macrotomia bosbutoensis* (from type location): a – general view; b – inflorescence (Photo by G. A. Lazkov).



Fig. 2. *Macrotomia bosbutoensis* (holotype specimen).



Fig. 3. *Macrotomia bosbutoensis* (habitat) (Photo by G. A. Lazkov).

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