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Research article

The rediscovery of *Isolabella graeca* Verhoeff, 1902 (Dermaptera, Spongiphoridae) in Greece after 123 years

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Abstract: The first confirmed Greek records of *Isolabella graeca* Verhoeff, 1902 since the species' original description is reported. A female and a male were collected in the Parnonas mountain range, providing the first verified Greek material in 123 years and clarify a long-standing biogeographic uncertainty. A short description of the specimens is provided, along with a discussion of its taxonomic status in relation to *Pseudisolabis kosswigi* Burr, 1947.

Keywords: Dermaptera, faunistics, Greece, taxonomy

Introduction

Isolabella graeca Verhoeff, 1902 is a rarely collected Dermaptera that was originally assigned to the family Cheliduridae (Verhoeff, 1902), later to Carcinophoridae (Harz & Kaltenbach, 1976), and finally to Labiidae (Steinmann, 1989), which is now Spongiphoridae (Engel & Haas, 2007). The species was originally described from a single male specimen reported only as originating from “Graecia, Coll. Stein” without specific locality information (Verhoeff, 1902). *Pseudisolabis kosswigi* Burr, 1947 described from Turkey was transferred to *Isolaboides* Hincks, 1958 and later synonymised with *I. graeca* (Hincks, 1958; Harz, 1975; Harz & Kaltenbach, 1976). Due to the absence of any verified Greek material after 1902, *I. graeca* was generally regarded as an Anatolian endemic, with Harz & Kaltenbach (1976) giving the distribution of the genus *Isolabella* Verhoeff, 1902 in India, Lebanon and Turkey.

Steinmann (1983) stated that the synonymy with *Isolabella* was incorrect and treated *I. kosswigi* and *I. graeca* as two separate species belonging to different subfamilies, Isolaboidinae and Labiinae respectively (Steinmann, 1989). This position was followed by Anlaş & Kočárek (2012), with the reasoning being that Harz & Kaltenbach's record of *I. graeca* from Denizli, Turkey, was based on the type specimens of *I. kosswigi*, and that their description of *I. graeca* was

consequently confused with that of *I. kosswigi* due to the then-accepted synonymy. Note that Harz concluded the synonymy after the examination of the remains of the holotype of *I. graeca* and a specimen from Turkey (Harz, 1975). Later Turkish authors also used *I. kosswigi* as a valid species, reporting it from several provinces of Turkey (Özgen et al., 2016; Örgel et al., 2020).

Herein the first confirmed occurrences of *I. graeca* in Greece, 123 years since its original description, are provided, while the first female from Greece is presented.

Materials and methods

On 15 of November 2025, two individuals, a female (Fig. 1A) and a male (Fig. 1B) Dermaptera were collected by the author under stones in two nearby montane localities of the Parnonas mountain range, Peloponnese. The female was collected in a small glade surrounded by *Abies cephalonica* Loudon, 1838, at 1465 m altitude (37°15'18.9"N 22°36'17.2"E), 4 km west of Kastanitsa, while the male was collected on a man-made plateau surrounded by (mostly) planted *Pinus nigra* J.F. Arnold, 1785, at 1395 m altitude (37°15'33.3"N 22°35'14.3"E), 5.5 km west of Kastanitsa. The male specimen was identified as *I. graeca* using the original description by Verhoeff

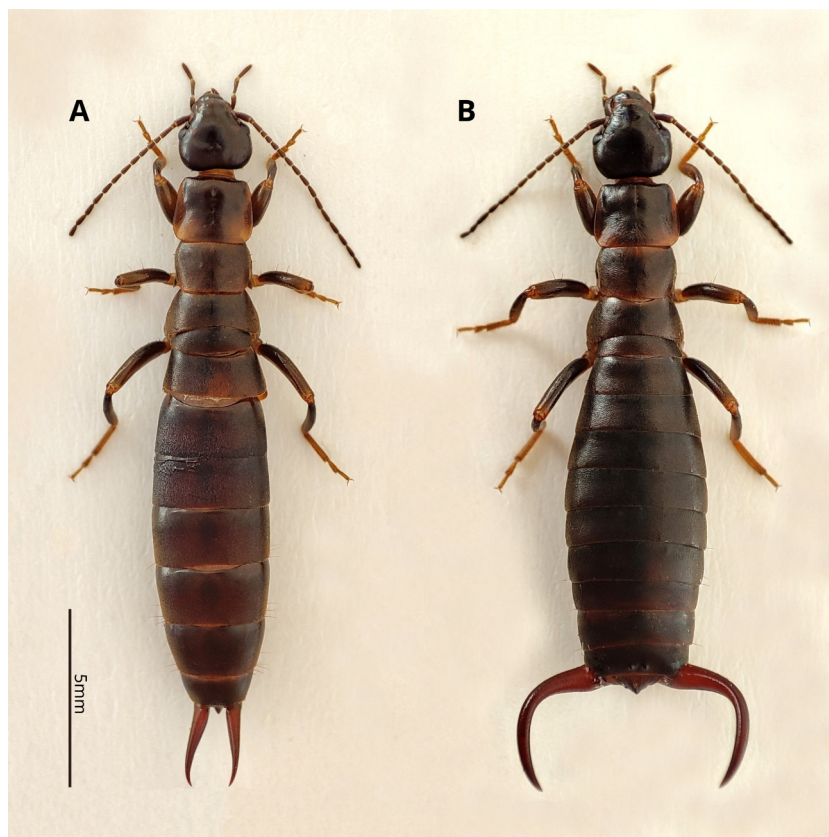


Fig. 1. Habitus of *Isolabella graeca* Verhoeff, 1902: A – female dorsal view; B – male dorsal view.

(1902), while the female was obviously of the same species. The two specimens are dry mounted on paper boards (the genitalia are preserved in glycerol), stored in the authors' collection.

Results and discussion

Both specimens are fully apterous, characterised by black colour, 17-segmented antennae, and dark red cerci. Orange markings are present on parts of the legs, the edges of the thorax, and as a post-ocular spot (Fig. 1). An exceptional post-mortem colour change was recorded in the female, which darkened to brown (Fig. 1A) before returning to black after 24 hours. The male measure 16.5 mm, while the female is slightly longer at 17.5 mm, both measurements excluding cerci.

The head is smooth, with few, short, erect setae, a longitudinal furrow on the vertex and faint transverse furrows toward the eyes. The pronotum is smooth, with few, short, erect setae, trapezoidal, possesses a distinct median furrow, and measures 1.8 mm in length in both sexes, although it is broader in the male

(measuring 2.4 mm) than in the female (measuring 2.2 mm). The mesonotum, the metanotum and the legs, are covered by pubescence, with a few, large erect setae. Note that the hind right leg of the male specimen, possesses only two tarsi (Fig. 1B).

The abdomen is covered by pubescence, with a few, large erect setae, and is densely and finely punctured. The male possesses terga that are distinctively shorter and broader. The first abdominal tergum is very small and is even more reduced in the male. The eighth tergum of the female is simple and narrow, while the tenth tergum of the male has a median longitudinal sulcus, with a small tubercle on each side of it towards the apex. The pygidium projects in the middle, a feature that is more pronounced and forms an obtuse angle in the male, whereas in the female it is short and pointed.

The cerci exhibit a significant sexual dimorphism. In the male, they are symmetrical, strongly curved, measure 3.6 mm in length, and are slightly covered by pubescence along the outer margin. They are slightly flattened on the inner and ventral sides and have a unique orientation with the left cercus pointing

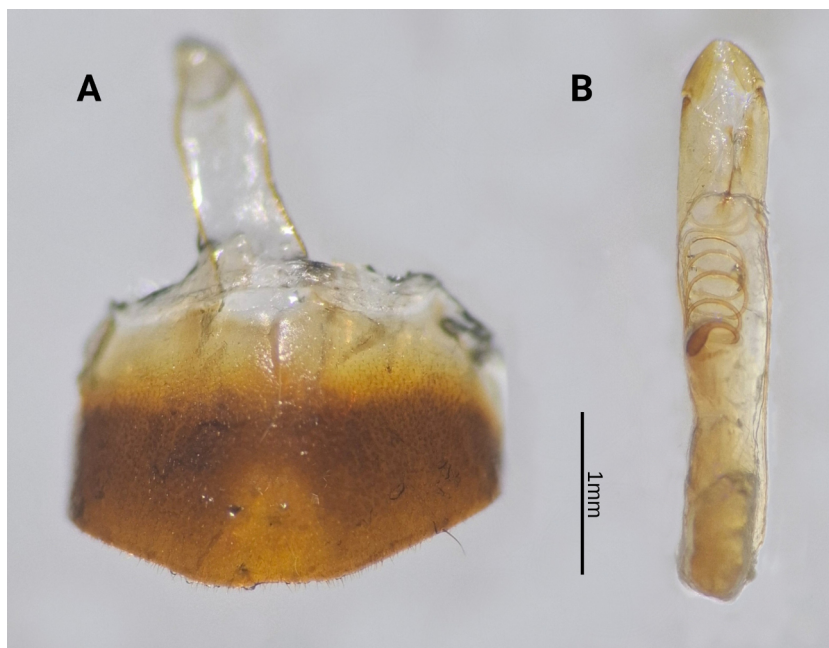


Fig. 2. *Isolabella graeca* Verhoeff, 1902 male: A – penultimate sternite, ventral view; B – genital armature, ventral view.

dorsally and the right ventrally. In contrast, the female's cerci are straighter and slenderer, the apex tapering and bending inward, dorsally pointing, measure 2.3 mm, and are completely covered by pubescence. Penultimate (9th) sternite (Fig. 2A) of male broader than long, hind margin broadly rounded. Male genitalia (Fig. 2B) with parameres almost pointed at the tip; virga strongly sclerotised with 7 spiral coils and a strongly sclerotised vesicle-like cyst.

In his work, Steinmann (1989) described the genitalia of *I. graeca* as being of Labiidae-type, describing the external parameres obtuse and that the virga lacks a basal vesicle, without any mention of a coiled or spiral structure. However, in the original description by Verhoeff (1902), the external parameres are described as being almost pointed at the tip and a highly specialised virga with 8 screw-like coils originating from a “distinct, robust vesicle”. The examined male here (Fig. 2B), possesses 7 spiral coils and a well-defined heavily sclerotised, vesicle-like cyst at its base, alongside almost pointed parameral tips, and they are identical with the illustrations of Burr (1947) in the original description of *I. kosswigi* and later Harz & Kaltenbach (1976). Furthermore, the unusually elongated and distinctive appearance of the tenth tergite figured by Steinmann (1989) is clearly an artifact; due to the broken abdomen of the severely damaged holotype (missing terga 5 to 8), the entire

structure of the tenth tergite was artificially exposed, causing its hidden anterior base and lateral apodemes to appear as exaggerated structural margins that do not reflect the natural morphology of an intact specimen.

The key diagnostic characters provided by Anlaş & Kočárek (2012) to separate the males of the two supposed species, and place them in different subfamilies in the text, are not applicable in the examined male from Greece. They defined *I. graeca* by a “trapezoidal, prominent” pygidium and an “incised” hind margin on the ultimate tergite, while *I. kosswigi* by a “trigonal medial projection, invisible from dorsal view” and the ultimate tergite with a straight hind margin. However, examination of the male *I. graeca* from Greece reveals discrepancies on both key characteristics. The pygidium is consistent with Verhoeff's (1902) description of a “hump-like bump,” forms a prominent medial obtuse angle, a shape incompatible with a simple trapezoid, while the hind margin of the ultimate tergite in the Greek specimen is relatively straight, not incised. These observations demonstrate that the defining characters in the key do not accurately describe the true *I. graeca*. Furthermore, it should be noted that no information on male genital morphology is provided. Given that the overall morphology of the Greek specimen agrees closely with published Turkish material (Burr, 1947; Harz & Kaltenbach, 1976) and

does not fit the contrasting characters proposed in the key, the separation of the two nominal taxa in different subfamilies is not currently supported. Direct comparative examination of Greek and Turkish specimens will be necessary to resolve their status, but based on the available evidence, *I. kosswigi* is treated herein as a junior synonym of *I. graeca*. Even if the two species are ultimately confirmed to be distinct, their morphology nonetheless indicates placement within the same genus.

In Turkey, *I. graeca* (as *I. kosswigi*) is a widespread species found across a variety of elevations, from 300 m to over 2100 m (Burr, 1947; Anlaş et al., 2010; Anlaş & Kočárek, 2012; Örgel et al., 2020). The rediscovery of the species in Greece, at elevations of 1395 m and 1465 m in Mount Paronass, falls well within this range. However, its apparent rarity in Greece is notable. This disjunct distribution pattern can probably be explained that either the species exists in Greece as a rare, localised, and potentially relict population at the periphery of its range, or its perceived rarity is an artifact of insufficient field research targeting its specific microhabitats in the country, or an incomplete sampling of the Greek fauna in general.

Conflicts of interest

No potential conflict of interest has been reported by the author, reviewers, or subject editor.

Author's contributions

(using [CrediT](#))

Gastouniotis Georgios: conceptualisation, data curation, formal analysis, investigation, methodology, resources, visualisation, writing—original draft.

References

- Anlaş S., Haas F., Tezcan S. 2010 Dermaptera (Insecta) fauna of Bozdağlar Mountain, Western Turkey. *Linzer biologische Beiträge* 42 (1): 389–399.
- Anlaş S., Kočárek P. 2012 Current status of Dermaptera (Insecta) fauna of Turkey and Cyprus. *Turkish Journal of Entomology* 36 (1): 43–58.
- Burr M. 1947 Two new species of Dermaptera from Turkey. *Proceedings of the Royal Entomological Society of London Series B, Taxonomy* 16: 60–65.
<https://doi.org/10.1111/j.1365-3113.1947.tb00859.x>
- Engel M.S., Haas F. 2007 Family-group names for earwigs (Dermaptera). *American Museum Novitates* 3567: 1–20.
[https://doi.org/10.1206/0003-0082\(2007\)539\[1:FNFDJ\]2.0.CO;2](https://doi.org/10.1206/0003-0082(2007)539[1:FNFDJ]2.0.CO;2)
- Harz K. 1975 Neue Orthopterenarten und Unterarten aus der Paläarkt. *Articulata* 1 (2): 1–20.
- Harz K., Kaltenbach A. 1976 Die Orthopteren Europas III. *Series Entomologica* 11. Springer, Dordrecht, 434 pp.
<https://doi.org/10.1007/978-94-017-2513-2>
- Hincks W.D. 1958 Some notes on Parisolabinae (Dermaptera). *EOS, Revista Española de Entomología* 34: 131–134.
- Örgel S., Balbakan M., Tezcan S. 2020 New locality records and additional information on Dermaptera (Insecta) Fauna of Turkey. *Munis Entomology and Zoology Journal* 15 (2): 623–626.
- Özgen İ., Ayaz T., Kır N. 2016 Dermaptera species in apricot orchards and its pest status in Malatya and Elazığ provinces of Eastern Anatolia, Turkey. *Biharean Biologist* 10 (1): 58–59.
- Steinmann H. 1983 A study of the higher taxa of the Chelisochidae (Dermaptera). *Annales Musei Historico-Naturalis Hungarici* 75: 139–144.
- Steinmann H. 1989 *World Catalogue of Dermaptera*. Kluwer Academic Publishers, Dordrecht, Netherlands, 934 pp.
- Verhoeff K. 1902 Über Dermapteren. 2. Aufsatz: Neue ungeflügelte Eudermapteren-Gattungen. *Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin* 1902 (1): 2–18.

Research article

Studies on the Balkan Lepidoptera II. Expected and unexpected species in Albania, September 2025

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Abstract: Results from two collecting nights in central-eastern and central Albania are presented. One genus (*Docirava* Walker, 1863) and two species (*Docirava dervenaria* and *Horisme radicularia*) are new to the Albanian fauna. Some other species are reported for a second or third time in the country. Altogether, data for 126 species of Lepidoptera from 2 localities are presented here, and habitats, some specimens, and their genitalia are illustrated in 37 figures.

Keywords: autumn species, faunistics, genitalia, moths

Introduction

The aim of the author's visit to Albania was to search for *Antitype suda schimae* Schawerda, 1911, a species, which he found in Bosnia and Herzegovina at the very beginning of September of the same year, but had not been found in Albania yet, although similar-looking habitats exist in Albania as well. The situation with *Eochoroca balcanica* (Rebel in Prinz, 1919) and *Bryophila seladona burgeffi* (Draudt, 1931) is similar – they are present in North Macedonia close to the border with Albania, but have not been found in Albania yet, although the present author, together with his wife, looked for them several times in September. During the Bulgarian national holiday weekend, 20–23 September, the weather was excellent for the season and was used for a three-day night collecting trip in Albania. On the last night, collecting was in Mali Me Gropa Mts (Central Albania, Tirana County), where *Antitype suda schimae* was collected in great numbers together with one unexpected species – *Gortyna borelii lunata* (Freyer, 1838). The results from Mali Me Gropa Mts are published in a separate article dedicated entirely to this area (Balogh et al., 2026). The other expected species, some of them mentioned above, were not found, but two new species for the country were collected together with some other interesting species. The second night was at much

lower altitude at Krraba Mt (see below for fuller details).

Because the nocturnal Lepidoptera of Albania, compared to Central European countries, are not well enough explored, all the species collected during this trip are listed here, some of which are poorly known in Albania, as well as the common species, some of which have been published from only a few localities in Albania.

Materials and methods

The night-time collecting methods have involved 2 portable light traps with an 8 watt “Blacklight” white tube (368 nm), powered by 12 volt 9Ah batteries, as well as a Finish “tent trap” with a 160 watt MV bulb at the top of the pole and a 20 watt fluorescent (368 nm) black light lamp over the catching pot below, supplementary the Finish “tent trap” was furnished with LepiLED, a 1.5 maxi model UV LED lamp with adapter and transformer 220 – 12V, powered by a generator. An additional EntoLight UV -LED E27-300mm 8 Watt 365-375nm and 395-405nm, 12 W with transformer lamp was also positioned about 70–90m from the tent trap. The maximum distance between the light traps was ca. 200–400 metres, as they were deployed with different outlooks wherever possible. All traps ran throughout the night.



Fig. 1. Collecting locality Maja Ahishtes Geges.



Fig. 2. Collecting locality Krraba.

Morphological methods. Genitalia were extracted following Fibiger (1997) and mounted on glass slides in Euparal after staining with a 2% Merbromin solution. All genitalia slides were photographed with a Zeiss stereo microscope Stemi 2000-C with Canon 2000 digital camera and transmitted light; the single illustrated everted vesicae and, in some cases, the female genitalia were photographed in alcohol before mounting on glass in Euparal. Specimens and collecting localities were photographed with a Sony DSChX400v digital camera. For specimens, the scale line is 1 cm. The genitalia slides and collected specimens are part of the collection of S. Beshkov in the NMNHS (National Museum of Natural History, Sofia). If the number of specimens is indicated, this means that they are in the collection of SB in NMNHS. Otherwise, they are only observed in the field but not collected. The trip was self-financed and undertaken in holiday time.

Lepidoptera families are arranged according to Aarvik et al. (2017, 2021). The sequence and nomenclature of families Erebidae and Noctuidae follow Fibiger et al. (2011), with changes incorporated from subsequent taxonomic revisions and the recently published books of Top et al. (2023) and Ronkay et al. (2024). The Geometridae are arranged according to Hausmann & Sihvonen (2019).

Collecting localities:

1. Maja Ahishtes Geges (Fig. 1): Pogradec County, above Ohrid Lake, below Maja Ahishtes Geges Summit, 1323m, N40.998, E020.6087, 20.XI.2025, open stony area with *Quercus daleshampii*, *Juniperus oxycedrus*, *Fraxinus ornus*. Nearby are *Buxus sempervirens*, *Corylus avellana*, *Acer* spp.

2. Krraba (Fig. 2): Situated almost on the border between Elbasan and Tirana County, Krraba Mt, above Dopaj Village, 471m, N41.1981, E019.9925, 21.IX.2025, Pseudomaquis with dominant: *Carpinus orientalis*, *Phyllirea latifolia*, *Erica arborea*; subdominant: *Juniperus oxycedrus*, *Cistus incanus* ssp. *creticus*, and individual *Quercus pubescens* and *Fraxinus ornus*, near ground road.

List of species

Crambidae

Mecyna subsequalis (Herrich-Schäffer, [1855]) Krraba, 1 female (Fig. 3). In Slamka (2013) for



Fig. 3. *Mecyna subsequalis* ♀. Krraba.

Europe *Mecyna subsequalis* is marked only for Greece (including Crete) Crimea and S Russia. *Mecyna subsequalis* was reported as a new species for Albania from the Ionian Sea Coast, Palasë near Dhërmi and from Vukopoles near Poliçan (Plant et al., 2017). Some more localities are listed in Plant et al., in press).

Cydalima perspectalis (Walker, 1859) Maja Ahishtes Geges. In this area around the ground road, the *Buxus sempervirens* bushes were fully defoliated. A similar situation is seen in many places in Northern and Central Albania.

Drepanidae

Watsonalla binaria (Hufnagel, 1767) Maja Ahishtes Geges.

Geometridae

Geometrinae

Phaiogramma etruscaria (Zeller, 1849) Krraba. Reported for Albania as *Chlorissa pulmantaria* (Guenée, 1858) in Rebel & Zerny (1931), Urbahn (1966), and Beshkov & Misja (1995). Some more localities followed after that: Shkallë (Beshkov et al., 2020b), Butrint (Beshkov & Nahirnić-Beshkova, 2025).

Ennominae

Dicrognophos sartata (Treitschke, 1827) Krraba. All published localities in Albania are summarised in

Beshkov & Nahirnić-Beshkova (2021) with additions in Beshkov & Nahirnić-Beshkova (2025) and Balogh et al. (2026). Not a rare species in Albania.

Rhoptria asperaria (Hübner, [1817]) Krraba.

Pachycnemidia hippocastanaria (Hübner, 1799) Krraba, 1 female.

Pachycnemidia tibiaria (Rambur, 1829) Krraba, 1 male. Known in Albania only from Vukopoles near Poliçan, also a single male specimen (Beshkov & Nahirnić, 2019b). Second locality for Albania.

Ennomos erosaria ([Denis & Schifferrmüller], 1775) Maja Ahishtes Geges; Krraba.

Eumera regina Staudinger, 1892 Krraba, 11 males. First reported for Albania by Beshkov (1995) from Dhermi, Ionian Coast. Known also from Mali i Thatë above Bregas (= Korita) Village and below Pepelash near Korçëa (Beshkov & Nahirnić, 2018b) and from Gjirokaster Region, between Mal Çajup and Erind (Beshkov & Nahirnić-Beshkova, 2025).

Crocallis elinguarina (Linnaeus, 1758) Maja Ahishtes Geges; Krraba.

Gerinia honoraria ([Denis & Schifferrmüller], 1775) Krraba. All published localities in Albania are summarised in Beshkov & Nahirnić-Beshkova (2021).

Opistograptis luteolata (Linnaeus, 1758) Krraba. Known from several localities across the country; the last report is that of Balogh et al. (2026) from 3 localities in Mali me Gropa Mt.

Aspilates ochrearia (Rossi, 1794) Krraba.

Menophra abruptaria (Thunberg, 1792) Krraba, 1 specimen. All published localities in Albania are summarised in Beshkov & Nahirnić-Beshkova (2021) with some additions in Beshkov & Nahirnić-Beshkova (2025). Not a rare species in Albania. The report by Beshkov (1995) for Dhermi concerns another species – *Menophra japygiaria* (O. Costa) (Beshkov & Nahirnić, 2020).

Selidosema plumaria ([Denis & Schifferrmüller], 1775) Krraba.

Peribatodes rhomboidaria ([Denis & Schifferrmüller], 1775) Maja Ahishtes Geges; Krraba. A common species in Albania (Balogh et al., 2026).

Peribatodes umbraria (Hübner, [1809]) Krraba. All reports for this species in Albania are summarised in Balogh et al. (2026).

Peribatodes correptaria (Zeller, 1847) Krraba. The first report for Albania was by Beshkov, Misja & Abadjiev (1996) from Dhermi, Ionian Coast. The other reports are summarised in Balogh et al. (2026).



Fig. 4. *Eumannia oppositaria* ♂. Krraba.

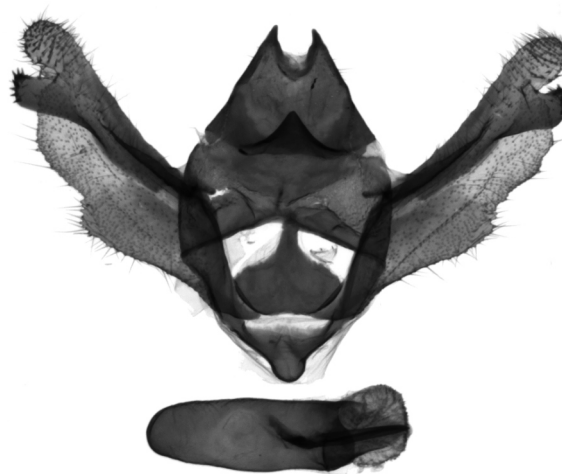


Fig. 5. *Eumannia oppositaria*, Krraba, male genitalia, Gen. prep. 1./30.XII.2025.

Eumannia oppositaria (Mann, 1864) Krraba, 1 male (Fig. 4) and 1 female, Gen. prep. 1./30.XII.2025, S. Beshkov, male genitalia on glass in euparal (Fig. 5). In Albania known from Kula e Lumës and Kuçi (Rebel & Zerny, 1931) and Pronovik near Berat (Beshkov et al., 2020a). Third report for Albania.

Sterrhinae

Idaea filicata (Hübner, [1799]) Krraba.

Idaea seriata cantenearia (Boisduval, 1840), Krraba, 1 male (Fig. 6) and 1 female. The recently published data are from Mali me Gropa (Balogh et al., 2026).

Idaea aversata (Linnaeus, 1758) Krraba, single not typical female (Fig. 7), identification was possible after examination of the genitalia, Gen. prep. 3./06. III.2026 (Fig. 8).



Fig. 6. *Idaea seriata cantenearia* ♂. Krraba.



Fig. 9. *Idaea straminata* ♂. Krraba.



Fig. 7. *Idaea aversata*, f. Krraba.



Fig. 8. *Idaea aversata*, Krraba, female genitalia, Gen. prep. 3./06.III.2026.

Idaea degeneraria (Hübner, [1799]) Maja Ahishtes Geges; Krraba. This species seems to be a common one in Albania (Balogh et al., 2026).

Idaea straminata (Borkhausen, 1794) Krraba, 1 male (Fig. 9). Reported also as *Idaea inornata* (Haworth, 1809) from several localities in Albania.

Scopula decorata ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges; Krraba.

Scopula submutata (Treitschke, 1828) Krraba. The recently published data are from two localities in Mali me Gropa (Balogh et al., 2026).

Scopula rubiginata (Hufnagel, 1767) Krraba.

Scopula imitaria (Hübner, 1799) Krraba, 1 female. Widely distributed and common in the country (Balogh et al., 2026).

Scopula marginepunctata (Goeze, 1781) Maja Ahishtes Geges; Krraba. Widely distributed and common in the country (Beshkov & Nahirnić, 2019a, Balogh et al., 2026).

Cyclophora puppillaria (Hübner, [1799]) Krraba.

Larentiinae

Docirava dervenaria (von Mentzer, 1981) Maja Ahishtes Geges, 3 females (Figs 10–12). A new genus and a new species for Albania. This species was described as *Aplocera dervenaria* von Mentzer, 1981: T.L. – North Macedonia, Derven Pass (above Prilep Town). At present, it is known from North Macedonia, SW Bulgaria (Struma Walley) and Greece, including the Peloponnese and Crete (Hausmann & Viidalepp, 2012). Northwestern Turkey is also mentioned in Hausmann & Viidalepp (2012), but the source of this information is unknown to the present author. It is listed in Koçak & Kemal (2018) without



Fig. 10. *Docirava dervenaria* ♀. Maja Ahishtes Geges.



Fig. 11. *Docirava dervenaria* ♀. Maja Ahishtes Geges.



Fig. 12. *Docirava dervenaria* ♀. Maja Ahishtes Geges.

any reference or details. Maybe the reason for its being included is the article of Riemis (1994), where this species is mentioned for Turkey, again without details. Riemis put an “*” which according to the text means that he supposedly has collected this species himself. Generally, the area marked in Hausmann & Viidalepp (2012) is not subject to many publications, so there must be a specific reason why they marked the area (pers. comm. Thomas Baron, March, 2026).



Fig. 13. *Colostygia wolfschlaegerae* ♀. Maja Ahishtes Geges.

Aplocera plagiata (Linnaeus, 1758) Maja Ahishtes Geges.

Xanthorhoe fluctuata (Linnaeus, 1758) Maja Ahishtes Geges.

Camptogramma bilineata (Linnaeus, 1758) Maja Ahishtes Geges. *C. bilineata* is currently known from many different locations across Albania (Balogh et al., 2026).

Colostygia wolfschlaegerae (Pinker, 1953) Maja Ahishtes Geges, 1 female (Fig. 13). Recently reported as a new for Albania from Monastir Peter & Pavel above Vithkuq, Korçë Region and from Ohrid Lake, Lin Peninsula (Beshkov & Nahirnić-Beshkova, 2025). A second report for Albania is that of Balogh et al. (2026) from Mali me Gropa. Third report for Albania.

Coenotephria ablutaria probaria (Herrich-Schäffer, 1852) Maja Ahishtes Geges, 6 males (Fig. 14) and 1 female. Beshkov & Nahirnić (2019a) reported *Coenotephria ablutaria probaria* as a new species for Albania. The second report for Albania is that of Beshkov et al. (2020a). However, from Hausmann & Viidalepp (2012) it is clear that, in the Balkans, *Coenotephria salicana* ([Denis & Schiffermüller], 1775) does not occur, although it is erroneously reported several times from the Balkans, including Albania. On the Balkan Peninsula, it is replaced by its closely related species *Coenotephria ablutaria* (Boisduval, 1840). In Albania reported also in Balogh et al. (2026).

Horisme vitalbata ([Denis & Schiffermüller], 1775) Krraba.

Horisme radicaria (La Harpe, 1855) Krraba, 1 female (Fig. 15), Gen. prep. 1./06.III.2026, female



Fig. 14. *Coenotephria ablutaria probaria* ♂. Maja Ahishtes Geges.



Fig. 15. *Horisme radicularia* ♀. Krraba.

genitalia on glass in euparal (Fig. 16). Colliculum (sclerotised part of the ductus bursae 1.2 mm, ap 1.2 mm, ap with papillae anales 1.8 mm. New species for Albania. Correct identification is possible after examination of the genitalia. In the female genitalia, the shape and the size of the colliculum are diagnostic and can surely split *Horisme radicularia* from its close relative *Horisme tersata* ([Denis & Schiffermüller], 1775) and from the other congeners.

Perizoma bifaciata (Haworth, 1809) Krraba, 1 female.

Eupithecia ericeata (Rambur, 1833) Maja Ahishtes Geges, 6 females (Fig. 17). Beshkov & Nahirnić (2019a) reported *Eupithecia ericeata* as a new record for Albania from numerous localities. The second report for Albania is that of Balogh et al. (2026). Third report for Albania.

Eupithecia semigraphata Bruand, 1851 Maja Ahishtes Geges, 1 male, genitalia with sternum 8ht checked, in microvial in glycerol; Krraba, 1 male and 1 female (Fig. 18). Not a rare species in Albania, recently reported by Balogh et al. (2026) from three localities in Mali me Gropa.

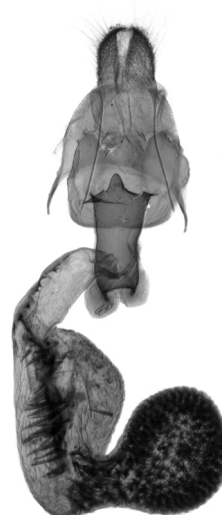


Fig. 16. *Horisme radicularia* Krraba, female genitalia, Gen. prep. 1./06.III.2026.



Fig. 17. *Eupithecia ericeata* ♀. Maja Ahishtes Geges.



Fig. 18. *Eupithecia semigraphata* ♀. Maja Ahishtes Geges.

Lasiocampidae

Trichiura crataegi (Linnaeus, 1758) Maja Ahishtes Geges, 1 male, genitalia checked.

Lasiocampa trifolii (Denis & Schiffermüller, 1775) Krraba.

Odonestis pruni (Linnaeus, 1758) Krraba.

Brachmaeidae

Lemonia strigata Antoshin & Zolotuhin, 2011 Maja Ahishtes Geges, 2 males, one of them without dark lines in the medial part of the wings. The authorship given here is according to Prozorov et al. (2022). According to Beshkov & Nahirnić-Beshkova (2021), perhaps all reports in the literature for Albania for *Lemonia taraxaci* ([Denis & Schiffermüller], 1775) refer to *Lemonia strigata*, a species that is not rare in Albania from September to November. It can be found from almost the sea coast (Beshkov & Nahirnić-Beshkova, 2025) to about 1395 m a.s.l. (Balogh et al., 2026). The two species are split chronologically and by altitude and can be easily separated by habitus as well.

Saturniidae

Saturnia caecigena Kupido, 1825 Maja Ahishtes Geges, abundant.

Notodontidae

Thaumetopoea processionea (Linnaeus, 1758) Krraba. Known in Albania from Kula e Lumës (Rebel & Zerny, 1931) and from Dajti-Mali me Gropë, 1095 m (Beshkov et al., 2020a). Third report for Albania.

Nolidae

Meganola togatulalis (Hübner, 1796) Krraba.

Erebidae

Lymantriinae

Arctornis l-nigrum (Müller, 1764) Krraba.

Ocneria rubea ([Denis & Schiffermüller], 1775) Krraba.

Arctiinae

Cymbalophora pudica (Esper, [1785]) Krraba, 3 males. Published localities in Albania, one of which belongs to another species (*Cymbalophora*

rivularis (Ménétriés, 1832)) are summarised in Beshkov & Misja (1995) and in Beshkov (1995). The report from Hocisht (Misja, 1978) belongs to another species – *Cymbalophora rivularis* (Ménétriés, 1832) (Beshkov & Misja, 1995, Beshkov, 1995).

Eilema caniola (Hübner, [1808]) Maja Ahishtes Geges; Krraba, 1 male, genitalia checked in microvial in glycerol.

Dysauxes famula (Freyer, 1836) Krraba. The only recent data regarding *D. famula* from Albania is provided by Beshkov et al. (2020a) and Balogh et al. (2026).

Hermiinae

Orectis proboscidata (Herrich-Schäffer, 1851) Krraba.

Paracolax tristalis (Fabricius, 1794) (= *derivalis* Hübner, 1796) Krraba.

Boletobiinae

Phytometra viridaria (Clerck, 1759) Krraba.

Eublemma parva (Hübner, [1808]) Krraba, 1 female.

Eublemma ostrina (Hübner, [1808]) Krraba. Current reports for Albania are summarised in Balogh et al. (2026).

Eublemma purpurina ([Denis & Schiffermüller], 1775) Krraba. Current reports for Albania are summarised in Balogh et al. (2026).

Toxocampinae

Lygephila procax (Hübner, [1813]) (= *limosa* Treitschke, 1826) Krraba. Current reports for Albania are summarised in Balogh et al. (2026).

Lygephila cracca ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges. Current reports for Albania are summarised in Balogh et al. (2026).

Erebinae

Catocala coniuncta (Esper, 1787) Krraba.

Dysgonia algira (Linnaeus, 1767) Krraba.

Noctuidae
Acronictinae

Acronicta psi (Linnaeus, 1758) Krraba, 1 male, genitalia checked.

Craniophora ligustri ([Denis & Schiffermüller], 1775) Krraba.

Oncocnemidiinae

Calophasia platyptera (Esper, 1788) Krraba.

Praestilbia armeniaca Staudinger, 1892 Krraba, 1 male. Current reports for Albania are summarised in Balogh et al. (2026).

Amphipyryinae

Amphipyra tragopoginis (Clerck, 1759) Maja Ahishtes Geges. Current reports for Albania are summarised in Balogh et al. (2026).

Heliothinae

Helicoverpa armigera (Hübner, [1808]) Krraba. Current reports for Albania are summarised in Balogh et al. (2026).

Condicinae

Condica viscosa (Freyer, [1813]) Krraba, 3 males (Figs 19–20).

Eriopinae

Callopietria juvenina (Stoll, 1782) Krraba.

Callopietria latreillei (Duponchel, 1827) Maja Ahishtes Geges; Krraba. Current reports for Albania are summarised in Balogh et al. (2026).

Bryophilinae

Bryopsis amasina (Draudt, 1931) Maja Ahishtes Geges, 1 male, genitalia checked, Gen. prep. 3./30.

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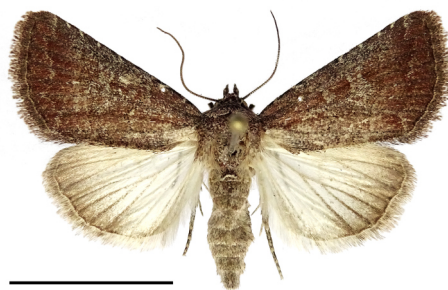


Fig. 19. *Condica viscosa* ♂. Krraba.



Fig. 20. *Condica viscosa* ♂. Krraba.



Fig. 21. *Bryopsis amasina* Maja Ahishtes Geges, male genitalia with everted vesica, Gen. prep. 3./30.XII.2025.

XII.2025, S. Beshkov, male genitalia with everted vesica on glass in Euparal (Fig. 21).



Fig. 22. *Calamia tridens* ♂. Maja Ahishtes Geges.



Fig. 24. *Sesamia nonagrioides* ♂. Krraba.

Noctuinae

Caradrina flavirena Guenée, 1852 Krraba. Current reports for Albania are summarised in Balogh et al. (2026).

Caradrina clavipalpis (Scopoli, 1763) Maja Ahishtes Geges. Common species in Albania. Current reports for Albania are summarised in Balogh et al. (2026).

Hoplodrina blanda ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges.

Hoplodrina ambigua ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges; Krraba. Current reports for Albania are summarised in Balogh et al. (2026).

Chlorothalpa (Subthalpa) subsericata (Herrich-Schäffer, 1861) Krraba. In Albania known from Shkallë (Beshkov & Nahirić, 2019a) and Puke, Terbunit Mts (Beshkov & Nahirić-Beshkova, 2025). Third report for Albania.

Thalpophila matura (Hufnagel, 1766) Maja Ahishtes Geges; Krraba. Current reports for Albania are summarised in Balogh et al. (2026).

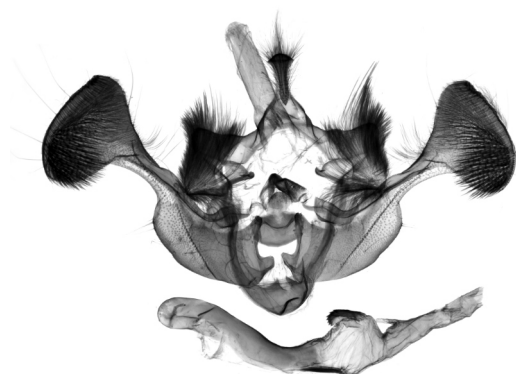


Fig. 23. *Mesapamea secalis* Maja Ahishtes Geges, male genitalia with everted vesica, Gen. prep. 3./29.XII.2025.



Fig. 25. *Sesamia nonagrioides* ♀. Krraba.

Chloantha hyperici ([Denis & Schiffermüller], 1775) Krraba.

Phlogophora meticulosa (Linnaeus, 1758) Maja Ahishtes Geges. Current reports for Albania are summarised in Balogh et al. (2026).

Calamia tridens (Hufnagel, 1766) Maja Ahishtes Geges, 1 male (Fig. 22).

Mesapamea secalis (Linnaeus, 1758) Maja Ahishtes Geges, 1 male, genitalia checked, male genitalia with everted vesica in microvial in glycerol; Krraba, 1 male, Gen. prep. 3./29.XII.2025, male genitalia with everted vesica on glass in euparal (Fig. 23). Current reports for Albania are summarised in Balogh et al. (2026). It may have been confused in the past with *Mesapamea secalella* Remm, 1983, a species also present in Albania.

Sesamia nonagrioides (Lefèbvre, 1827) Krraba, 1 male (Fig. 24) and 1 female (Fig. 25).

Episema tersa ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges, 1 male. Current reports for Albania are summarised in Balogh et al. (2026).

Episema korsakovi macedonica G. Ronkay & L. Ronkay, 2025 Maja Ahishtes Geges, 1 male

Cleoceris scoriacea (Esper, [1789]) Maja Ahishtes Geges.



Fig. 26. *Anchoscelis thurneri* ♂. Maja Ahishtes Geges.



Fig. 28. *Anchoscelis litura* ♀. Maja Ahishtes Geges.



Fig. 27. *Anchoscelis thurneri* ♂. Maja Ahishtes Geges.

Atethmia ambusta ([Denis & Schiffermüller], 1775) Krraba.

Tiliacea aurago ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges. Known from three localities in Albania, summarised in Balogh et al. (2026).

Mesogona acetosellae ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges. Known only from three localities in Albania, summarised in Balogh et al. (2026).

Anchoscelis thurneri (Boursin, 1953) Maja Ahishtes Geges, 2 males (Fig. 26) and 1 female (Fig. 27).

Anchoscelis nitida ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges, 1 female

Anchoscelis litura (Linnaeus, 1758) Maja Ahishtes Geges, 1 female (Fig. 28), Gen. prep. 2./06. III.2026, female genitalia on glass in euparal (Fig. 29). ap 5,0 mm, aa 3.2, db 1.0, a-ab 2.4, pa 8.0 mm according to the scheme in Beshkov & Nahirnić (2018a). In Tables 1 and 2 in Beshkov & Nahirnić (2018) the measurements are wrong; to be correct, they must be counted $\times 2$. In Albania, three localities known, summarised in Balogh et al. (2026).

Anchoscelis humilis ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges, 1 male, aberrant (Fig. 30).

Conistra rubiginea ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges; Krraba. In Albania,



Fig. 29. *Anchoscelis litura*, Maja Ahishtes Geges, female genitalia, Gen. prep. 2./06.III.2026.



Fig. 30. *Anchoscelis humilis* ♂. Maja Ahishtes Geges.

published from three localities only (Balogh et al., 2026).



Fig. 31. *Antitype chi* ♀. Maja Ahishtes Geges.

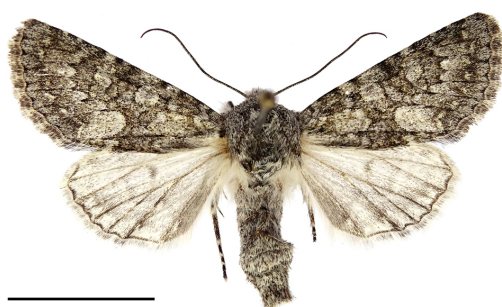


Fig. 32. *Antitype suda schimae* ♀. Maja Ahishtes Geges.



Fig. 33. *Antitype suda schimae*, Maja Ahishtes Geges, female genitalia, Gen. prep. 1./10.XI.2025.



Fig. 34. *Antitype suda schimae*, Maja Ahishtes Geges, female genitalia (reversed), Gen. prep. 1./10.XI.2025.

Antitype chi (Linnaeus, 1758) Maja Ahishtes Geges, 1 female (Fig. 31). In Albania, published from three localities only (Balogh et al., 2026).

Antitype suda schimae Schawerda, 1911 Maja Ahishtes Geges, 1 female (Fig. 32), Gen. prep. 1./10.XI.2025, female genitalia on glass in euparal, pictures (Figs 33–34) taken in alcohol before covering with a cover glass. Reported as a new species for Albania by Balogh et al. (2026). Second report for Albania. For more details about the possible confusion of *A. suda* and *Antitype jonis* (Lederer, 1865), see Balogh et al. (2026). Corrected data about the distribution of *Antitype jonis* and *Antitype suda schimae* in Albania and neighbouring countries is in preparation and will be published soon (Beshkov, in press).

Ammoconia caecimacula ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges. Known from four other localities in Albania, summarised in Balogh et al. (2026).

Ammoconia senex (Geyer, [1828]) Maja Ahishtes Geges. The known localities in Albania are summarised in Balogh et al. (2026).

Aporophyla canescens (Duponchel, 1826) Maja Ahishtes Geges. The known localities in Albania are summarised in Balogh et al. (2026).

Polymixis serpentina (Treitschke, 1825) Maja Ahishtes Geges, 1 male. The known localities in Albania are summarised in Balogh et al. (2026).



Fig. 35. *Euxoa temera* ♂. Maja Ahishtes Geges.

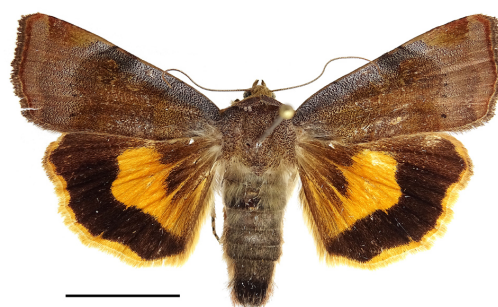


Fig. 37. *Noctua tertia* ♀. Maja Ahishtes Geges.



Fig. 36. *Agrotis catalaunensis* ♂. Krraba.

Mniotype solieri (Boisduval, 1840) Krraba, 1 male.

Tholera decimalis (Poda, 1761) Maja Ahishtes Geges. Known reports for Albania are summarised in Balogh et al. (2026).

Mythimna vitellina (Hübner, [1808]) Maja Ahishtes Geges. All known localities in Albania are summarised in Balogh et al. (2026).

Mythimna sicula scirpi Duponchel, 1836 Krraba, 1 male, genitalia checked. All known localities in Albania are summarised in Balogh et al. (2026).

Mythimna albipuncta ([Denis & Schiffermüller], 1775) Krraba. Common species in Albania, known reports are summarised in Balogh et al. (2026).

Mythimna ferrago (Fabricius, 1787) Krraba. Widespread species in Albania (Balogh et al., 2026).

Mythimna l-album (Linnaeus, 1767) Maja Ahishtes Geges; Krraba. Common species in Albania, known reports are summarised in Balogh et al. (2026).

Leucania putrescens (Hübner, [1824]) Krraba.

Euxoa temera (Hübner, [1808]) Maja Ahishtes Geges, 1 male (Fig. 35). Reported only three times from Albania, reports are summarised in Balogh et al. (2026).

Agrotis segetum ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges. Common species in Albania, known reports are summarised in Balogh et al. (2026).

Agrotis catalaunensis (Millière, 1873) Krraba, 2 males (Fig. 36).

Agrotis trux (Hübner, [1824]) Maja Ahishtes Geges; Krraba. Known reports for Albania, are summarised in Balogh et al. (2026).

Agrotis ipsilon (Hufnagel, 1766) Maja Ahishtes Geges. Common species in Albania, known reports are summarised in Balogh et al. (2026).

Chersotis margaritacea (de Villers, 1789) Maja Ahishtes Geges. Known reports for Albania, are summarised in Balogh et al. (2026).

Noctua pronuba (Linnaeus, 1758) Maja Ahishtes Geges; Krraba. Very common species in Albania, known reports are summarised in Balogh et al. (2026).

Noctua fimbriata (Schreber, 1759) Maja Ahishtes Geges. Very common species in Albania, known reports are summarised in Balogh et al. (2026). Without examination of the genitalia, confusion with the next species is very possible.

Noctua tirrenica Biebing, Speidel & Hanigk, 1983 Maja Ahishtes Geges, genitalia checked; Krraba, genitalia checked. Known reports for Albania are summarised in Balogh et al. (2026).

Noctua interposita (Hübner, 1790) Maja Ahishtes Geges.

Noctua comes Hübner, [1813] Maja Ahishtes Geges; Krraba.

Noctua tertia von Mentzer, Moberg & Fibiger, 1991 Maja Ahishtes Geges, 2 females (Fig. 37); Krraba, 1 female. Not a rare species in Albania, known reports are summarised in Balogh et al. (2026).

Epilecta linogrisea ([Denis & Schiffermüller], 1775) Maja Ahishtes Geges; Krraba.

Xestia castanea michaeli Ronkay, Ronkay & Varga, 2024 Maja Ahishtes Geges, 1 male. Known reports for Albania are summarised in Balogh et al. (2026).

Xestia xanthographa ([Denis & Schiffermüller], 1775) Krraba, 1 female. Common species in Albania, known reports are summarised in Balogh et al. (2026).

Xestia cohaesa (Herrich-Schäffer, [1849]) Maja Ahishtes Geges, 2 males; Krraba, 2 males. Not a rare species in Albania, known reports are summarised in Balogh et al. (2026).

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Conflicts of interest

No potential conflict of interest has been reported by the author, reviewers, or subject editor.

Author' contributions

(using [CrediT](#) )

Stoyan Beshkov: conceptualisation, data curation, formal analysis, investigation, methodology, resources, visualisation, writing—original draft, writing—review and editing.

References

- Aarvik L., Bengtsson B. E., Elven H., Ivinskis P., Jürivete U., Karsholt O., Mutanen M., Savenkov N. 2017 Nordic-Baltic Checklist of Lepidoptera. Norwegian Journal of Entomology Supplement 3, 236 pp.
- Aarvik L., Bengtsson B.Å., Elven H., Ivinskis P., Jürivete U., Karsholt O., Mutanen M., Savenkov

N. 2021 Additions and corrections to the Nordic-Baltic Checklist of Lepidoptera. Norwegian Journal of Entomology 68: 1–14.

Balogh B., Tóth B., Horváth A., Beshkov S., Varga N. 2026 Two autumn collecting expeditions highlight the under-researched Lepidoptera fauna of Albania: new records and notes on related literature with additions to the fauna of the country (Lepidoptera: Macrolepidoptera). *Historia naturalis bulgarica* 48(7): 189–219.

Beshkov S. 1995 A contribution to the knowledge of the Lepidoptera fauna of Albania 2. Some findings of a collecting trip in September 1993 (Lepidoptera, Macrolepidoptera). *Atalanta* 26 (1/2): 365–399.

Beshkov S., Misja K. 1995 A contribution to the knowledge of the Lepidoptera fauna of Albania. 1. Some materials from the collection of K. Misja in the natural history Museum Tirana and some results of the collecting trip of Beshkov during 1992 (Lepidoptera, Macrolepidoptera). *Atalanta* 26 (1/2): 345–363.

Beshkov S., Misja K., Abadjiev S. 1996 A contribution to the knowledge of the Lepidoptera fauna of Albania. 3. Some results of the collecting in April 1994 and some materials from the collection of the Natural History Museum of Tirana (Lepidoptera, Macrolepidoptera, Heterocera). *Atalanta* 27 (3/4): 623–648.

Beshkov S., Nahirnić A. 2018a Three new *Anchoscelis* Guenée, 1839 species for Albania and two for the Republic of Macedonia (Lepidoptera, Noctuidae). *Atalanta* 49 (1–4): 171–176.

Beshkov S., Nahirnić A. 2018b A contribution to knowledge of the Balkan Lepidoptera: new and rare moths for Albania, collected in 2017. *Entomologist's Record and Journal of Variation* 130: 215–232.

Beshkov S., Nahirnić A. 2019a A contribution to knowledge of the Balkan Lepidoptera: species collected in the autumn of 2018 in Albania (Macrolepidoptera with some Crambidae). *Entomologist's Record and Journal of Variation* 131: 66–102.

Beshkov S., Nahirnić A. 2019b A contribution to knowledge of Balkan Lepidoptera: some new and rare species for Albania and North Macedonia (Macrolepidoptera). *Entomologist's Record and Journal of Variation* 131: 242–260.

- Beshkov S., Nahirnić A. 2020 Contribution to knowledge of the Balkan Lepidoptera (Lepidoptera: Macrolepidoptera). *Ecologica Montenegrina* 30: 1–27.
- Beshkov S., Nahirnić-Beshkova A. 2021 Contribution to knowledge of the Balkan Lepidoptera II (Lepidoptera: Macrolepidoptera). *Ecologica Montenegrina* 42: 1–44.
- Beshkov S., Nahirnić-Beshkova A. 2025 Studies on the Balkan Lepidoptera I. *Historia naturalis bulgarica* 47 (8): 169–285.
- Beshkov S., Plant C., Nahirnić A. 2020a A Contribution to Knowledge of the Balkan Lepidoptera: Some species collected in Albania in August 2018. *Entomologist's Record and Journal of Variation* 132: 129–152.
- Beshkov S., Plant C.W., Nahirnić A., King A., Jakšić P. 2020b A contribution to knowledge of Balkan Lepidoptera: moths collected in May-June 2018 in Austria, Slovenia, Serbia, North Macedonia and Albania. *Entomologist's Record and Journal of Variation* 132: 24–45.
- Fibiger M. 1997 Noctuidae III. Noctuidae Europaeae, 3. Entomological Press, Sorø, 418 pp.
- Fibiger M., Yela J.L., Zilli A., Varga Z., Ronkay G., Ronkay L. 2011 Checklist of the quadrid Noctuoidea of Europe. In: Witt T.J., Ronkay L. (eds) Noctuidae Europaeae, Volume 13: Lymantriinae and Arctiinae. Entomological Press, Sorø, 23–24.
- Hausmann A., Sihvonen P. (eds) 2019 Revised, annotated systematic checklist of the Geometridae of Europe and adjacent areas Vols 1–6. In: Hausmann A., Sihvonen P., Rajaei H., Skou P. (eds) The Geometrid Moths of Europe 6. Brill, Leiden, 795–871.
- Koçak A.Ö., Kemal M. 2018 A synonymous and distributional list of the species of the Lepidoptera of Turkey. Centre for Entomological Studies Ankara, *Memoirs* 8: 1–487.
- Misja K. 1978 Donnees sur l'étude des papillons du groupe Heteroneura de l'Albanie. *Buletini i Shkencave të Natyrës* 3: 65–73.
- Plant C.W., Beshkov S., Bond K.G.M., Buchner P., Fazekas I., Graf F., Larsen K., Richter I. (In press) A first, provisional, annotated checklist of the microlepidoptera of Albania (Insecta: Lepidoptera). *SHILAP Revista de lepidopterología*.
- Plant C., Beshkov S., Jakšić P., Nahirnić A. 2017 A contribution to knowledge of the Balkan Lepidoptera. Some Pyraloidea (Lepidoptera: Crambidae & Pyralidae) encountered recently in southern Serbia, Montenegro, the Republic of Macedonia and Albania. *University Thought* 7 (2): 1–27.
- Prozorov A.M., Prozorova T.A., Volkova J.S., Yakovlev R.V., Nedoshivina S.V., Pinzari M., Pinzari M., Scalercio S., Bianco G., Saldaitis A., Hausmann A., Revay E.E., Müller G.C. 2022 Revision of the *Lemonia taraxaci* complex, with a description of a new species from Italy and clarification of the status of *Lemonia strigata* (Lepidoptera: Brahmaeidae: Lemoniinae). *Zootaxa* 5195 (4): 337–360.
<https://doi.org/10.11646/zootaxa.5195.4.2>
- Rebel H., Zerny H. 1931 Die Lepidopterenfauna Albaniens. *Denkschriften der Akademie der Wissenschaften, Math. Nat. Kl. Wien* 103: 37–161.
- Riemis A. 1994 Geometridae of Turkey 3. A provisional list of the Geometridae of Turkey (Lepidoptera). *Phegea* 22: 15–22.
- Ronkay G., Ronkay L., Varga Z. 2024 Fibigeriana Supplement. Volume 4. Magyarország nagylepkéi, Harmadik, átdolgozott kiadás. Heterocera Press, Budapest, 318 pp.
- Slamka F. 2013 Pyraloidea (Lepidoptera) of Europe, Volume 3. Pyraustinae & Spilomelinae. Identification – Distribution – Habitat – Biology. František Slamka Publisher, Bratislava (Slovakia), 357pp.
- Top M., Fritsch D., Kononenko V. 2023 Noctuidae Europaeae Essential. Oestermarie, Bornholm, 837 pp.
- Urbahn E. 1966 Ergebnisse der Albanien-Expedition 1961 des Deutschen Entomologischen Institutes. 51. Beitrag. Lepidoptera: Geometridae. *Beitrage zur Entomologie* 16 (3–4): 407–446.

Research article

Medicinal plant database of the Republic of Buryatia (Russia)

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Abstract: The medicinal flora of the Republic of Buryatia includes 556 species of vascular plants, with Asteraceae, Rosaceae and Ranunculaceae as the leading families. Plants of forest and steppe floristic complexes dominate, reflecting the region's position within the light-coniferous taiga and forest-steppe zones. The predominance of wide-ranging species (57%) and herbaceous perennials (64.5%) is typical of boreal floras and indicates that the medicinal flora consists mainly of ecologically plastic taxa adapted to a harsh continental climate. The majority of medicinal plants (91%) are used exclusively in traditional oriental medicine and lack pharmacopoeial status, revealing a significant knowledge gap and underscoring the urgent need for comprehensive phytochemical, pharmacological and toxicological studies. Twenty-five species are rare and under considerable threat, mainly due to over-harvesting for commercial and traditional use. The absence of monitoring and up-to-date data on their distribution and abundance impedes the development of effective conservation measures. A relational database using Microsoft Access has been developed to store, systematise and analyse data on the medicinal flora of Buryatia. The database includes taxonomic information, ecological preferences, distribution data, resource potential assessments, conservation status, and traditional uses for each species. It supports querying and filtering by multiple criteria, enabling researchers to extract customised datasets for floristic, phytochemical and pharmacological studies. The database is designed for long-term maintenance and expansion, serving as a foundation for conservation planning, sustainable resource management and educational purposes.

Keywords: database, medicinal plant, Republic of Buryatia

Introduction

For centuries, medicinal plants have formed the basis of traditional medicine and remain relevant in modern clinical practice, despite significant advances in the development of synthetic drugs (Hamilton, 2004; Allen & Hatfield, 2004; Chen et al., 2016 Süntar, 2020). Global demand for plant-based medicinal products is steadily growing: according to WHO forecasts, the share of herbal medicines in the global pharmaceutical market could reach 60% in the coming decades (WHO, 2025). In European countries and the United States, about 78% of prescription drugs are of natural origin, while in developing

countries, up to 80% of the population rely entirely on plant-based remedies for primary healthcare (Shafi et al., 2021; WHO, 2026). The popularity of herbal medicines is attributed to their advantages: a complex and mild action, a reduced risk of side effects and resistance development, as well as the synergistic effects of their constituent bioactive compounds.

In 2025, the World Health Assembly adopted the World Health Organization (WHO) Global Traditional Medicine Strategy for 2025–2034 and its implementation into national healthcare systems. The implementation of this strategy requires standardised, high-quality plant raw materials, which stimulates the development of industrial cultivation of medicinal

plants. In a number of countries (the USA, Japan, South Korea, China, India, as well as European Union member states), this practice has already become widespread (Kamil, 2012; Chen et al., 2016). National programs have been established to introduce wild medicinal species into cultivation, agrotechnical regulations and standardisation systems (Good agricultural and collection practices (GACP), Good manufacturing practices (GMP)) have been developed, which ensures stable quality of raw materials and their compliance with international requirements (WHO, 2026). Plantation cultivation volumes in these countries increase annually, driven both by growing domestic consumption of herbal medicines and by an export orientation.

In Russia, the main source of medicinal plant raw materials remains the harvesting of wild species (Leonova & Miklyaeva, 2021; Gryazkin et al., 2025). This is primarily due to the extensive natural reserves of medicinal plants across most of the country, which for a long time made industrial cultivation economically unnecessary.

However, the exploitation of wild plant species in Russian regions is often combined with insufficient knowledge of their resource potential: complete and up-to-date data on the taxonomic composition of the medicinal flora are still lacking in most regions; many herbarium collections are not digitised and are inaccessible to the wider scientific community; and resource assessments are fragmentary and lack a unified methodological framework. There is also no systematic monitoring of the state of medicinal plant coenopopulations, which makes it impossible to estimate permissible harvesting volumes or to identify signs of overexploitation in a timely manner.

Thus, there is a clear need to create regional databases that provide detailed scientific information about the botanical characteristics of medicinal plants and their active substances. Such databases have been developed in the Tomsk region (Postnikova, 2021), the Perm region (Kalikina et al., 2022), the Belgorod region (Netrebenko et al., 2010), and the Ural region (Vasfilova et al., 2014). The accumulated information from these databases is valuable for the future development of a comprehensive national database that will reflect the full phytoresource potential of Russia.

Nevertheless, for many regions characterised by high floristic diversity, such work has not yet been carried out. The Republic of Buryatia is one such region. Located at the interface of two different natural

zones – the East Siberian mountain-taiga and the Central Asian steppe – it possesses rich biological diversity. Over 2,100 species of vascular plants grow on its territory, many of which have proven pharmacological activity and are used in both official and traditional medicine (Telyatyev, 1985; Batorova et al., 2013). Of particular value to the flora of region is the presence of relict plants that have survived from past geological epochs and occur in local habitats – refugia. A significant proportion of these plants are listed in the Red Data Book of the Republic of Buryatia (Anenkhonov, 2023) and the Red Data Book of the Russian Federation (Geltman, 2024). Some of them not only shape the unique character of the region flora but also possess valuable medicinal properties, which determines their use in folk and Tibetan medicine. At the same time, their chemical composition and resource potential remain poorly studied.

Furthermore, the Republic of Buryatia is one of the largest centers of traditional Eastern medicine in Russia – it is the only constituent entity of the Russian Federation where traditional medicine is certified and has official status. For half a century, systematic research on Tibetan medical sources has been conducted in the region: the Buryat Scientific Center, the Institute of Mongolian, Buddhist and Tibetan Studies of the Siberian Branch of the Russian Academy of Sciences, based on the “Atlas of Tibetan Medicine” (Parfionovich, 1994; Basarov, 2025), have developed more than 70 medical patents for dietary supplements, which include classical Tibetan formulations with substitutes of local plant raw materials (Batorova et al., 2013).

However, notwithstanding the abundance of natural resources and the long-standing traditions of their application in both folk and conventional medicine, along with ongoing investigations into the chemical composition of selected species (Mizina et al., 2024), comprehensive data on the taxonomic composition of medicinal plants in the region, their resource potential, and permissible collection limits remain unavailable. This knowledge gap significantly hampers the development of a sustainable system for the regional supply of pharmaceutical plant raw materials and underscores the need for integrated scientific studies.

Consequently, the aim of this study was to inventory the medicinal flora of the Republic of Buryatia and to develop a database for the systematisation of the collected information.

Material and methods

The Republic of Buryatia is located in the southern part of Eastern Siberia, in the centre of the Eurasian continent. It covers an area of 351,334 km². The region is characterised by a mountainous-basin relief, with absolute elevations ranging from 456 m above sea level (Lake Baikal) to 3,491 m above sea level (mountain Munkhu-Sardyk, Bolshoy Sayan Range).

The orographic basis of this territory is formed by two large, geomorphologically distinct areas: the High Mountain Belt (Sayan-Baikal Highlands, above 1,200 m a.s.l.) and the Transbaikalian mid-mountains and plateaus (Selenga mid-mountains, 800–1,200 m a.s.l.) (Sochava, 1967). These ranges are separated by intermountain depressions of the Baikal type (Barguzinskaya, Verkhneangarskaya) and the Transbaikalian type (Gusinoozerskaya, Ivolginsko-Udinskaya, and others), which differ in their symmetry, structure, and the thickness of sedimentary deposits (Florensov, 1960).

The region has a sharply continental climate, with long, cold winters and short, warm summers. The average January temperature -22°C and average July temperature +19°C. The growing season lasts between 90–155 days. The average annual precipitation is 250 mm (Sochava, 1967).

Due to the complex terrain, there is a significant variety of microclimates, which creates a mosaic of landscapes. Around 83% of the territory is covered by coniferous forests, while steppe and forest-steppe complexes, with salt marshes and sand, are common in the southern areas. Tundra vegetation is found in the highlands above 1,600 m a.s.l., and shrubby thickets, meadows, and marshes can be found in all altitudinal zones. This high landscape diversity accounts for the significant richness of the republic's flora (Anenkhonov, 2001).

The sources used to compile the list of medicinal plants of the Republic of Buryatia included data from the State Pharmacopoeia of the Russian Federation, XIV edition (Ministry of Health of the Russian Federation, 2018), as well as reference books on traditional Tibetan medicine (Batorova et al., 2013) and folk medicine (Telyatev, 1985). All scientific plant names were verified and brought into conformity with the accepted nomenclature of the World Flora Online (WFO; <https://www.worldfloraonline.org>). Information on species distribution was obtained from the identification

guide to the plants of Buryatia (Anenkhonov, 2001), herbarium collections of the Institute of General and Experimental Biology, SB RAS (Ulan-Ude) and Buryat State University (Ulan-Ude), as well as open internet resources: <https://www.plantarium.ru> and <https://www.inaturalist.org>.

To create the database “Wild Medicinal Plants of the Republic of Buryatia”, the relational DBMS Microsoft Access (MS Office 2010 or later) was used. The choice of this platform is justified by its compliance with the relational model, which is optimal for structuring complex interrelated data, as well as by its sufficient functionality for solving the defined tasks, including sorting, filtering and executing queries. The database is provided as a RAR archive containing the file “Medicinal Plants of Buryatia.accdb” and a “Photos” directory with plant images in JPG format. The database file contains a complete set of objects: tables with source data, queries for data processing, forms for data entry and editing, and reports for presenting results.

The names of chemical compounds and active substances from plants were standardised according to the International Nonproprietary Names (INN) system of the World Health Organization (WHO, 2023). For substances without an established INN, the nomenclature of the International Union of Pure and Applied Chemistry (IUPAC) was used.

The pharmacological action of plants and their components was classified using the WHO Anatomical Therapeutic Chemical (ATC) classification system, including its extension for herbal medicines – Herbal ATC (HATC). This ensures a uniform scientific framework for describing therapeutic groups and mechanisms of action. Disease indications were linked using the International Classification of Diseases, 11th Revision (ICD-11) (WHO, 2024).

Results and discussion

The flora of the Republic of Buryatia, comprising over 2,160 plant species (Anenkhonov, 2001), includes a wide range of useful species utilised by the local population for medicinal, food, and technical purposes, as well as a forage base for livestock.

The analysis of literature sources and herbarium materials showed that the medicinal flora of the Republic of Buryatia includes 556 species of vascular

Table 1. Taxonomic composition of medicinal plants in the flora of the Republic of Buryatia.

Divisions and classes	Number of families	Number of genera	Number of species
Lycopodiophyta	2	3	6
Equisetophyta	1	1	8
Polypodiophyta	9	10	14
Pinophyta	3	6	12
Magnoliophyta total	82	283	516
of which:			
Magnoliopsida	62	240	452
Liliopsida	20	40	64
Total	97	300	556

Table 2. Spectrum of leading families of medicinal plants in the flora of the Republic of Buryatia.

Families	Rank	Number of species
Asteraceae	1	69
Rosaceae	2–3	42
Ranunculaceae	2–3	42
Fabaceae	4	37
Polygonaceae	5	23
Lamiaceae	6–7	21
Scrophulariaceae	6–7	21
Ericaceae	8	17
Brassicaceae	9–10	16
Apiaceae	9–10	16
Total amount of species	—	556

plants belonging to 300 genera, 97 families, 7 classes and 5 divisions (Table 1). Angiosperms constitute the basis of the medicinal flora (93% of the total number of species).

In terms of the number of species (Table 2), the Asteraceae family ranks first (69 species from 32 genera), followed by Rosaceae (42 species from 19 genera) and Ranunculaceae (42 species from 16 genera). This distribution corresponds to the general patterns of the boreal flora (Artemov, 2024).

The most diverse genera include *Artemisia* (13 species); *Potentilla* (12 species); *Ranunculus* (9 species); *Astragalus* (8 species); *Oxytropis* (8 species); *Thalictrum* (7 species); and *Pedicularis* (6 species). Most genera (60%) consist of only one species.

Such a significant diversity of the genera *Artemisia*, *Astragalus* and *Oxytropis* is due not only to their high phytotherapeutic value – *Artemisia* species are known for their antimicrobial, anti-inflammatory, and anthelmintic effects (Bora & Sharma, 2011; Trendafilova et al., 2018), while *Astragalus* species have gained increasing attention as immunomodulatory and adaptogenic agents (Fu et al., 2014; Li et al., 2014) – but also to the widespread occurrence of steppe landscapes in the region. This highlights the significant contribution of the arid element to the composition of the flora. In turn, representatives of the genera *Potentilla*, *Ranunculus*, *Thalictrum* and *Pedicularis* are typical components of forest-steppe, forest and meadow communities.

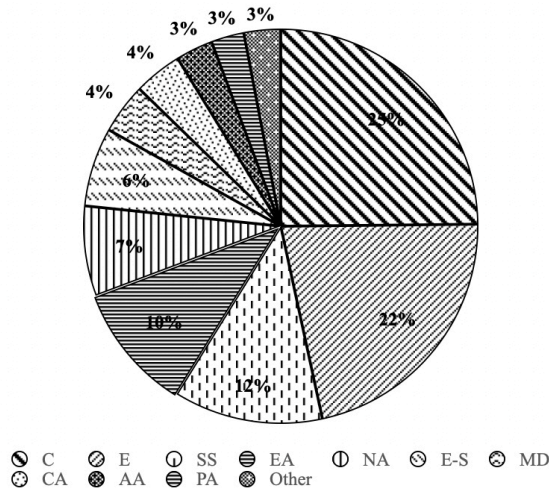


Fig. 1. The distribution of medicinal plant species according to areal type in the Republic of Buryatia. Areal type: C – Circumpolar, E – Eurasian, SS – South Siberian, EA – East Asian, NA – North Asian, E-S – Euro-Siberian, MD – Manchurian-Daurian, CA – Central Asian, AA – Americanoasiatic, PA – Pan-Asian.

Ecological and geographical analysis of the medicinal plant flora of the Republic of Buryatia revealed a predominance of species with wide ranges extending beyond Asia, which account for 57% of the total number of taxa (Fig. 1). Among these, Circumpolar, Eurasian, Euro-Siberian and American-Asian groups dominate. The proportion of species of Asian origin is 41%, with a clear predominance of South Siberian, East Asian and North Asian range types. The proportion of endemic species with narrow local ranges is insignificant (2%), which confirms the general trend towards the predominance of ecologically plastic, widely distributed taxa in the composition of the medicinal flora.

Most medicinal plants in the region belong to the forest floristic complex (32%), dominated by light-coniferous forest species (22%). This reflects the zonal conditions: Buryatia's location within the light-coniferous taiga zone (Smagin, 1980) has made this vegetation type a key resource for phytotherapy. The second largest group is the steppe (mainly forest-steppe) complex (29%), more than twice as large as the high-mountain complex. This ratio highlights the importance of forest-steppes as contact zones that serve as sources of biodiversity and medicinal resources, where species from different ecological groups co-occur.

In the biomorphological spectrum, there is an absolute dominance of herbaceous life forms, which number 438 species and constitute 78.5% of the total species composition of the medicinal flora. Among herbaceous plants, perennial species predominate (64.5%), which is characteristic of boreal floras, where the ability to withstand long periods of unfavourable conditions is a crucial adaptive advantage. As noted by L.I. Malyshev (1965), perennial life forms dominate in high-latitude floras, as underground storage organs (rhizomes, bulbs, taproots) provide effective overwintering strategies.

Of the 556 medicinal plant species documented in the Republic of Buryatia, only 49 (less than 9%) possess pharmacopoeial status – that is, they are officially approved for therapeutic use – whereas the vast majority are used exclusively in traditional Oriental medicine. This disparity highlights a significant gap between officially recognised herbal remedies and the rich ethnopharmacological knowledge accumulated by local communities. The limited number of pharmacopoeial species restricts the integration of traditional medicinal plants into evidence-based healthcare systems and the pharmaceutical industry, underscoring the need for comprehensive phytochemical, pharmacological, and toxicological studies of the region's medicinal flora.

The Red Book of the Republic of Buryatia includes 25 species of medicinal vascular plants (Anenkhonov, 2023). Among them, four species – *Cypripedium calceolus* L., *Cypripedium macranthum* Sw., *Orchis militaris* L., and *Rhodiola rosea* L. – are also listed in the Red Book of the Russian Federation (Geltman, 2024), indicating their particular vulnerability and the need for enhanced conservation measures at both regional and federal levels. For the vast majority of protected species, up-to-date data on their distribution are lacking, and monitoring is not carried out. As a result, their coenopopulations continue to experience excessive anthropogenic pressure due to commercial demand for plant material and the ornamental qualities of some species, which leads to a steady decline in their numbers.

A particularly telling example is *Rhododendron adamsii*. Despite being listed in regional Red Data Books, its uncontrolled harvesting has continued for decades in the Tunkinsky, Kabansky and Okinsky districts of Buryatia. Its widespread use in traditional Tibetan and folk medicine as a tonic, adaptogen,

cardiotonic and anti-inflammatory agent greatly increases the pressure on its natural populations. A critical aggravating factor is the almost complete absence of reliable data on the resource potential, reproduction patterns and actual distribution of the species, which makes it impossible to objectively assess the extent of its depletion and to develop effective conservation measures.

Similar threats affect *Glycyrrhiza uralensis*, *Rhodiola rosea*, *Dryopteris filix-mas*, as well as recently exploited species such as *Saposhnikovia divaricata*. According to the IUCN Red List, approximately 28% of assessed plant species are threatened by over-harvesting for medicinal and ornamental purposes (Hayward, 2011), and the lack of up-to-date data on population status has been identified as a major barrier to effective conservation (Schippmann et al., 2006; Chand et al., 2025).

To systematise and store data on the medicinal plants of the region, we developed a relational database using Microsoft Access. This platform allows us to create an information system with a user-friendly graphical interface for data entry, querying, and reporting.

The database contains detailed information on 556 species of wild medicinal plants of the Republic of Buryatia used in both scientific and traditional medicine. Each plant record comprises two main blocks – botanical and pharmacological – and includes 31 data fields covering the following:

- taxonomic characteristics and morphological description;
- geographical distribution detailed by administrative districts and ecotope types;
- ecological parameters (range type, altitudinal and zonal affiliation, ecological group, life form);
- conservation status according to the 4th edition of the Red Book of the Republic of Buryatia (2023);
- pharmacological properties (medical systems applied, chemical composition, therapeutic action, dominant groups of biologically active compounds);
- practical aspects of use (type of plant material, harvesting time);
- resource assessment and recommendations for sustainable use;
- bibliographic references to scientific sources;
- photographic illustration of the plant.

Figures 2 and 3 provides an overview of the content organisation, highlighting the main sections of the database. This structure enables users to quickly obtain comprehensive information on each species, including its ecological preferences, resource potential, vulnerability status, and practical applications. The database is intended for researchers, environmental authorities, and interested private users alike. This multistakeholder orientation reflects the growing demand for accessible, structured information on medicinal plants, which has been noted in reviews of global ethnobotanical databases (Hidayat, 2023).

The database search system allows users to construct queries of any complexity, combining taxonomic, ecological, geographical, pharmacological, conservation, and resource-related criteria. This enables researchers to tailor searches to specific objectives – from selecting a species based on a single attribute to multi-criteria analysis accounting for several conditions simultaneously. Figure 4 illustrates the search algorithm for plants whose main active constituents are alkaloids: the left panel shows the parameter selection interface, while the right panel presents the query result (44 species). Figure 5 demonstrates a similar algorithm for plants containing phenolic compounds and belonging to the light-coniferous zone-altitudinal group: the left panel shows the selection options, and the right panel displays the result (21 species).

To facilitate work with the information on medicinal plants stored in the database, the system provides for the generation of structured reports based on user-defined parameters. Reports can be exported in formats suitable for further analysis (e.g., spreadsheet files, text documents), ensuring seamless integration with external scientific and applied systems (Fig. 6).

The relational structure of the database is expected to enable complex queries across all tables and fields. Unlike typical online databases of medicinal plants, the proposed system emphasises the integration of multimedia content with analytical and reference data.

A comparison of the developed database with other regional information resources on medicinal plants revealed its key advantages. Existing regional database are limited to taxonomic and morphological information, along with descriptions of practical plant uses. Many of them are essentially digitised herbarium collections or electronic versions of printed reference works, where the ecological characteristics of

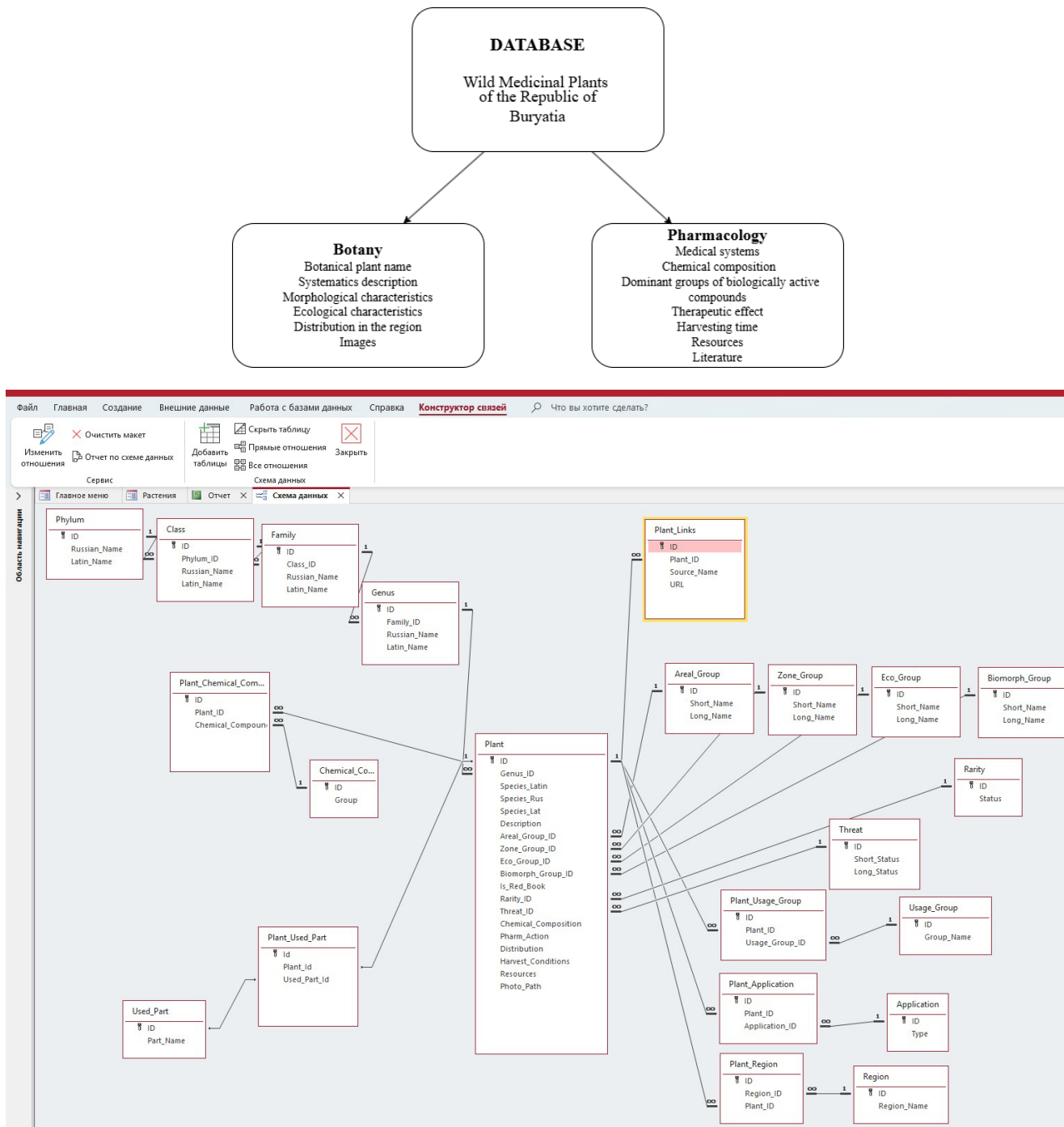


Fig. 2. Simplified organisation diagram of the database.

species are either absent or presented in a fragmented and unstructured manner. Our database is among the few that systematises ecological information and includes it as a full-fledged search criterion.

Moreover, unlike some analogues that support only simple searches by one or two parameters (e.g., plant name, disease), our database allows users to

construct queries of any complexity, combining taxonomic, ecological, geographical, pharmacological, conservation, and resource-related criteria. This enables researchers to address a wide range of tasks – from selecting a species by a single attribute to multi-criteria analysis involving several conditions simultaneously.

Файл Главная Внешние данные Работа с базами данных Справка Что вы хотите сделать? Ресурсы Создание Изменить Удалить Оформить по образцу Буфер обмена Фильтр По возрастанию По убыванию Удалить сортировку Выделение Дополнительно Фильтр Обновить все Удалить Закладки Создать Сохранить История Орфография Дополнительно Найти Заменить Перейти Выбрать Найти Ж К Ы А Б В Г Д Е З И Й Л М Н О П Р С Т У Ф Х Ц Ч Ш Щ Э Ю Я Форматирование текста			
Лекарственные растения Республики Бурятия			
ID	16		
Отдел	Пауцивидные	Lycopodiophyta	+
Класс	Пауцивидные	Lycopodiopsida	+
Семейство	Баранцовые	Huperziaceae Rothm.	+
Род	Баранец	Huperzia Bernh.	+
Вид	Баранец обыкновенный	Huperzia selago (L.) Bernh. Ex Schrank et Mart.	
Морфологическое описание	Вечнозелёное травянистое равноспоровое многолетнее растение высотой до 30 см. Стебли прямостоячие, интенсивно-зеленые, у основания восходящие, апогеиально разветвленные. Листья многочисленные, шириной около 1 мм, линейно-ланцетовидные, цельнокрайные или слабозубчатые, кожистые, отстоящие от стебля, расположены в 8 продольных рядов. Спорингии шаровидные, желтоватые, на коротких ножках, расположены в пазухах листьев в верхней или средней части стебля; споры очень мелкие. В пазухах листьев часто образуются малозаметные выводковые почки длиной до 4 мм. <i>Средообразовательное растение в альпийских тундрах, высокогорных и субальпийских лесах.</i>		
Тип ареала	Циркумполярный	Химический состав сырья	Трава содержит алкалоиды (0.6-1.1%, никотиндин, ликодоллин, 12-эпиликодоллин (псевдоселлагин), 7α-гидроксиникотроилликодоллин, аниотинин, аниотоксин, аурифонин, α-обскурин, β-обскурин, куперин A, куперин B, селлагонин, серратин, серратинин, туписинон, алкалоиды L8, L20, L30). Каротиноиды: β-каротин, лютеин, эпиксил лютеина, зеаксантин, неоксантин, β-криптоксантин, родоксантин, мутатооксантин. Фенолкарбоновые кислоты: в надземной части – феруловая, ванилиновая. Флавоноиды: литеоллин, апигенин, тришин, селлагин.
Поясно-зональная группа	Темнохвойная	Фармакологическое действие	Трава баранца характеризуется рвотным, диуретическим, слабительным, abortивным и антиоксидантным действием. Ее отвар применяют для лечения хронического алкоголизма, никотиновой зависимости, псориаза, болезни Альцгеймера. Поскольку трава баранца очень токсична, лечение проводится лишь в условиях стационара под контролем врача. Разработана нормативная документация на препарат «Ликсодолина витрат», используемый как седативное средство, купирующее абстинентный алкогольный синдром. Известны противопоказания к лечению отваром баранца: это сахарный диабет, гипертоническая болезнь, бронхиальная астма, эпилепсия, язва желудка.
Экологическая группа	Гигромезофит	Группа лекарственных растений по спелеифике действия	Применение Рвотные Мочегонные Слабительные Антиоксидантные
Жизненная форма	Трава кустостебельная		
Место произрастания и экология	Бореальный голарктический вид. Растет во влажных хвойных лесах, кедровых и лиственных редколесьях, зарослях кедрового стланика, высокогорных тундрах, на скалах.		

Fig. 3. Data entry window.

Fig. 4. Example of a database search for plants containing alkaloids.

Fig. 5. Example of a combined database search for plants by active compound and zone-altitudinal group.

Файл Главная Создание Внешние данные Работа с базами данных Справка Что вы хотите сделать?

Режимы Вставить Вырезать Копировать Буфер обмена Формат по образцу

Фильтр По возрастанию По убыванию Удалить сортировку Фильтр

Сортировка и фильтр

Обновить Удалить Сохранить

Главное меню Растения Отчет

Список растений

ID: 40

Отдел: Плауновидные (Lycopodiophyta)

Класс: Плауновидные (Lycopodiopsida)

Семейство: Баранцевые (Huperziaceae Rothm.)

Род: Баранец (Huperzia Bernh.)

Вид: *Баранец обыкновенный (Huperzia selago (L.) Bernh. Ex Schrank et Mart.)*

Морфологическое описание

Вечнозеленое травянистое равноспоровое многолетнее растение высотой до 30 см. Стебли прямостоячие, интенсивно-зеленые, у основания восходящие, лихотомически разветвляющиеся. Листья многочисленные, шириной около 1 мм, линейно-ланцетовидные, цельнокрайные или слабозубчатые, кожистые, отстоящие от стебля, расположенные в 8 продольных рядов. Спорангии шаровидные, желтоватые, на коротких ножках, расположены в пазухах листьев в верхней или средней части стебля; споры очень мелкие. В пазухах листьев часто образуются малозаметные выводковые почки длиной до 4 мм. Спороношение происходит в апреле-июне. После спороношения и развития выводковых почек побеги продолжают вегетировать (иногда более 10 лет). Хамефит.

Ареологическая группа

Поясно-зональная группа

Экологическая группа

Гигромезофит

Биоморфологическая группа

Трава кистекопная

Вид внесен в Красную книгу Республики Бурятия

Статус редкости: Не регламентируется

Статус угрозы

Не регламентируется

Применение

Народная медицина

Используемые части

Трава

Распространение (районы)

Окинский, Кабанский, Джидинский, Закаменский, Северо-Байкальский, Баргузинский, Курумканский, Муйский

Группа по принципу действия

Мочегонные, Слабительные, Рвотные, Антиоксидантные

Доминирующие группы химических соединений

Алкалоиды

Химический состав сырья

Трава содержит алкалоиды (0.6-1.1%, ликоподии, ликодоллин, 12-эпилюдолин (псевдоселагин), 7α-гипроксангидролюдолин, аниотинин, аниотоксин, акрифоллин, α-обскурин, β-обскурин, хуперин А, хуперин В, селоголин, серратин, серративин, пушилолин, алкалоиды L8, L20, L30). Каротиноиды: β-каротин, лютеин, зиксил лютеин, зеаксантин, неоксантин, β-криптоксантин, родоксантин, мутаоксантин. Фенолкарбоновые кислоты: в надземной части – феруловая, ванилиновая. Флавоноиды: лютеолин, апигенин, трицин, селанин.

Фармакологическое действие

Трава баранца характеризуется рвотным, диуретическим, слабительным,



Fig. 6. Search result.

Thanks to the interconnections between the main thematic blocks (botany, pharmacology, toxicology, chemistry) and related tables, the database is designed to support:

- research in plant physiology, biochemistry and phytochemistry;
- comprehensive analyses based on distribution, ecological preferences, chemical composition and pharmacological action;
- visualisation of relationships between species, bioactive compounds and therapeutic effects.

Data on medicinal plants have been compiled from scientific literature and can be continuously updated as new information becomes available regarding chemical composition, resource potential, conservation status and practical applications of the species. This flexibility is crucial for evidence-based conservation prioritisation (Farnsworth et al., 2020).

Conclusion

The medicinal flora of the Republic of Buryatia comprises 556 species of vascular plants, with Asteraceae, Rosaceae and Ranunculaceae being the leading families. Ecologically, the forest and steppe floristic complexes dominate, reflecting the zonal position of the region within the light-coniferous taiga and forest-steppe zones.

The predominance of species with wide ranges (57%) and herbaceous perennial life forms (64.5%) is characteristic of boreal floras, indicating that the medicinal flora of Buryatia has been formed mainly from ecologically plastic, widely distributed taxa adapted to the harsh continental climate.

The majority of medicinal plants in Buryatia (91%) are used exclusively in traditional Oriental medicine and lack pharmacopoeial status. This highlights a significant knowledge gap and underscores the urgent need for comprehensive phytochemical, pharmacological and toxicological studies of these species to facilitate their integration into evidence-based healthcare.

Rare and endangered medicinal plants of Buryatia (25 species) face considerable threats, mainly from over-harvesting for commercial and traditional purposes. The complete absence of monitoring and up-to-date data on the distribution and abundance of these species impedes the development of effective conservation measures.

The object-relational database created in this study provides a structured information system for storing, systematising and analysing data on the medicinal flora of Buryatia. It is designed to support research, education, conservation planning and sustainable resource management.

Future work should focus on (i) conducting field surveys to update the distribution and population status of rare and threatened medicinal species; (ii) initiating pharmacological and toxicological studies of non-pharmacopoeial species; and (iii) developing mobile applications based on the database to facilitate species identification in the field.

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Conflicts of interest

No potential conflict of interest has been reported by the authors, reviewers, or subject editor.

Author's contributions

(using [CrediT](#))

Larisa Afanaseva: conceptualisation, data curation, investigation, supervision, validation, visualisation, writing—original draft, writing—review and editing; Yurii Rupyshev: data curation, investigation, writing—review and editing; Irina Dylgyrova: data curation, investigation, validation, visualisation; Arina Serebryukhova: data curation, investigation, validation, visualisation.

References

- Allen D.E., Hatfield G. 2004 Medicinal plants in folk tradition: an ethnobotany of Britain and Ireland. Timber Press, Cambridge, 431 pp.
- Anenkhonov O.A. (ed.) 2001 Identification of plants of Buryatia. Institute of general and experimental biology, SB RAS, Ulan-Ude, 672 pp. (In Russian)
- Anenkhonov O.A. (ed.) 2023 The Red Data Book of the Republic of Buryatia: Rare and endangered species of plants and fungi). Konstanta, Belgorod, 342 pp. (In Russian)
- Artemov I.A. 2024 Flora of the Western Tannu-Ola Ridge (Tuva Republic). Flora and vegetation of Asian Russia 1: 47–59.
- Bazarov B.V. (ed.) 2025 Atlas of Tibetan Medicine: illustrations to the Vaidurya-onbo Treatise (17th Century). Nauka – Eastern literature, Moscow, 535 pp. (In Russian)
- Batorova S.M., Yakovlev G.P., Aseeva T.A. 2013 Handbook of medicinal plants of traditional Tibetan medicine. Nauka, Novosibirsk, 292 pp. (In Russian)
- Bora K.S., Sharma A. 2011 The genus *Artemisia*: a comprehensive review. Pharmaceutical biology 49 (1): 101–109.
- Chand G., Kumar S.M., Sanjeet K., Banshidhar D. 2025 Medicinal plant conservation strategies for sustainable use and management. In: Modern approaches in medicinal plants and plant taxonomy. Ambika Prasad Research Foundation, 88–100.
- Chen S.L., Yu H., Luo H.M. et al. 2016 Conservation and sustainable use of medicinal plants: problems, progress, and prospects. Chinese Medicine 11: 37.
<https://doi.org/10.1186/s13020-016-0108-7>
- Florensov N.A. 1960 Mesozoic and cenozoic basins of the Baikal region. USSR Academy of Sciences, Moscow, Leningrad, 237 pp. (In Russian)
- Fu J., Wang Z., Huang L., Zheng S., Wang D., Chen S., Zhang H., Yang S. 2014 Review of the botanical characteristics, phytochemistry, and pharmacology of *Astragalus membranaceus* (Huangqi). Phytotherapy Research 28 (9): 1275–1283.
- Geltman D.V. (ed.) 2024 Red Data Book of the Russian Federation. Plants and Fungi. VNII Egologiya, Moscow. 944 pp. (In Russian)
- Gryazkin A.V., Paramonov S.G., Voldaev L.K., Shmelev G.B., Kashafyev I.R. 2025 Species composition and resource potential of medicinal plants in spruce forests of the Leningrad Region. Pharmacy Formulas 7 (2): 62–68.
- Hamilton A.C. 2004 Medicinal plants, conservation and livelihoods. Biodiversity & Conservation 13: 1477–1517.
- Hayward M.W. 2011 Using the IUCN Red List to determine effective conservation strategies. Biodiversity & Conservation 20: 2563–2573.
<https://doi.org/10.1007/s10531-011-0091-3>
- Hidayat S., Subositi D., Batubara I., Esti M., Sjaiful A., Cahyaningsih R. 2023 Scientific databases for conservation of medicinal plants. In: Medicinal plants: biodiversity, biotechnology and conservation. Springer, Singapore, 265–287.
- Kalikina I.Yu., Turyshv A.Yu., Kuritsyn A.V. 2022 Using GIS to analyse medicinal flora of Russian regions. InterCarto InterGIS 28 (2): 321–331. (In Russian)
- Kamil M. 2012 Assuring production of quality raw botanical materials – cultivation, collection and post-harvest practices. Planta Medica 78: 7.
- Leonova N.B., Miklyaeva I.M. 2021 Nature and resource potential of officinal plants flora of Ciscaucasia. Arid Ecosystems 11: 156–163.
<https://doi.org/10.1134/S2079096121020104>
- Li W., Sun Y.N., Yan X.T. et al. 2014 Flavonoids from *Astragalus membranaceus* and their inhibitory effects on LPS-stimulated pro-inflammatory cytokine production. Archives of Pharmacal Research 37 (2): 186–192.
<https://doi.org/10.1007/s12272-013-0174-7>

- Malyshev L.I. 1965 The high mountain flora of Eastern Sayan: a review of vascular plants, composition features and florogenesis. Nauka, Moscow, Leningrad, 368 pp.
- Ministry of Health of the Russian Federation 2018 State pharmacopoeia of the Russian Federation, 14th edition. Volume IV. 6675 pp. (In Russian)
- Mizina P.G., Lupanova I.A., Karabaeva V.V., Ferubko E.V., Altaeva O.A., Tsybikova O.M., Davydova O.Yu. 2024 Medicinal plants with general strengthening and tonic activity growing in the Republic of Buryatia (review). Issues of biological, medical and pharmaceutical chemistry 27 (1): 3–14
- Netrebenko N.N., Sorokopudov V.N., Sorokopudova O.A., Bakshutov S.A., Ogneva O.V., Gavryushenko E.V. 2010 Electronic database of wild medicinal plants of the Belgorod region. Scientific News. Series Medicine. Pharmacy 22 (93): 137–140. (In Russian)
- Parfionovich Yu.M. (ed.) 1994 Atlas of Tibetan medicine. Collection of illustrations to the 17th-century Tibetan medical treatise: album. Galart, Moscow, 592 p. (In Russian)
- Postnikova M.E. 2021 Development of a database of medicinal plants of the Tomsk region. Bachelor's final qualification work, Tomsk. 81 pp. (In Russian)
- Shafi A., Hassan F., Zahoor I., Majeed U., Khanday F.A. 2021 Biodiversity, management and sustainable use of medicinal and aromatic plant resources. In: Medicinal and aromatic plants. Cham, Springer, 85–111.
https://doi.org/10.1007/978-3-030-58975-2_3
- Smagin V.N. (ed.) 1980 Forest types in the mountains of Southern Siberia. Nauka, Novosibirsk. 336 pp. (In Russian)
- Sochava V.B. (ed.) 1967 Atlas of Transbaikalia (Buryat ASSR and Chita Oblast). GUGK, Moscow, Irkutsk, 167 pp. (In Russian)
- Süntar I. 2020 Importance of ethnopharmacological studies in drug discovery: role of medicinal plants. Phytochemistry Reviews 19: 1199–1209.
<https://doi.org/10.1007/s11101-019-09629-9>
- Telyatyev V.V. 1985 Useful plants of Central Siberia. Irkutsk, 384 pp. (In Russian)
- Trendafilova A., Todorova M., Genova V., Peter S., Wolfram E., Danova K., Evstatieva L. 2018 Phenolic profile of *Artemisia alba* Turra. Chemistry & Biodiversity 15 (7): e1800109.
<https://doi.org/10.1002/cbdv.201800109>
- Vasfilova E.S. et al. 2014 Wild medicinal plants of the Urals. Ural State University, Ekaterinburg. 204 pp. (In Russian)
- WHO 2023 The use of stems in the selection of International nonproprietary names (INN) for pharmaceutical substances. Geneva.
- WHO 2024 Collaborating Centre for Drug Statistics Methodology. ATC/DDD Index Norwegian Institute of Public Health, Oslo.
- WHO 2025 Global Traditional Medicine Centre: Annual Report. Geneva.
- WHO 2026 WHO Traditional Medicine Strategy: 2025–2034. Geneva.
