



Artemisia absinthium L.
Artemisia annua L.
Artemisia dracunculus L.
Artemisia leucodes Schrenk
Artemisia scoparia Waldst. & Kit.
Artemisia vulgaris L.
Eclipta prostrata (L.) L.

ASTERACEAE

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Synonyms

Artemisia annua L.: *Artemisia chamomilla* Winkl.
Artemisia dracunculus L.: *Artemisia aromatica* A. Nelson; *Artemisia dracunculina* S. Watson; *Artemisia dracunculoides* Pursh; *Artemisia dracunculoides* var. *dracunculina* (S. Watson) S.F. Blake; *Artemisia dracunculus* subsp. *dracunculina* (S. Watson) H.M. Hall & Clem.; *Artemisia glauca* Pall. ex Willd.; *Artemisia glauca* var. *megacephala* B. Boivin; *Oligosporus dracunculus* (L.) Poljakov
Artemisia leucodes Schrenk: *Artemisia leucodes* (Schrenk) Poljakov

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***Artemisia scoparia* Waldst. & Kit.:** *Artemisia capillaris* fo. *angustisecta* Pamp.; *Artemisia capillaris* fo. *elegans* (Roxb.) Pamp.; *Artemisia capillaris* fo. *kohatica* (Klatt) Pamp.; *Artemisia capillaris* fo. *myriocephala* Pamp.; *Artemisia capillaris* fo. *tenuifolia* Pamp.; *Artemisia capillaris* fo. *villosa* (Korsh.) Pamp.; *Artemisia capillaris* fo. *williamsonii* Pamp.; *Artemisia capillaris* fo. *scoparia* (Waldst. & Kit.) Pamp.; *Artemisia elegans* Roxb.; *Artemisia kohatica* Klatt; *Artemisia scoparia* fo. *sericea* Kom.; *Artemisia scoparia* var. *heteromorpha* Kitag.; *Artemisia scopariiformis* Popov; *Oligosporus scoparius* (Waldst. & Kit.) Less.; *Oligosporus scoparius* (Waldst. & Kit.) Poljakov

***Artemisia vulgaris* L.:** *Artemisia opulenta* Pamp.; *Artemisia vulgaris* var. *glabra* Ledeb.; *Artemisia vulgaris* var. *kamtschatica* Besser

***Eclipta prostrata* (L.) L.:** *Artemisia viridis* Blanco

Local Names

***Artemisia absinthium*:** **Iran:** Afsantin (افسنطون) (Mozaffarian 2013), Agh-suzeh, Eshek-bozqan (Ghorbani 2005); **Russian:** Польшьгорькая (Polyn' gor'kaya); Польшьябсент (polinabsent) (Russian), аджыйовшан (adshiyovshan) (Azeri); ошиндр (oshindr) (Armenian); abzinda (Georgian) (Grossheim 1952); **English:** common wormwood, absinthe (Ketskhoveli et al. 1971–2011; Makashvili 1991; Sokolov 1993)

***Artemisia annua*:** **Georgian:** უჯანგარი (ujangari); **Russian:** Польшь однолетняя (Polyn' odnoletnyaya); **English:** sweet sage; wort, sweet wormwood, sweet annie, Chinese wormwood

***Artemisia dracunculus*:** **Georgian:** ტარხუნა (t'arkhuna), აბზინდა (abzinda), ავშანი (avshani); მიწავაშლა (mits'avashla); მწარე აბზინდა (mts'are anzinda); **Tushetian:**

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გიეში (gieshi), ხმატურა (khmat'ura); **Russian:** Полынь Эстрагон (Polyn' estragon), эстрагон (estragon); **Azeri:** тархун (terkhun); **Armenian:** тархуნი (tarragon) (Armenian) (Grossheim 1952); **English:** Russian tarragon, wild tarragon, estragon, silky wormwood (Ketskhoveli et al. 1971–2011; Makashvili 1991; Sokolov 1993)

Artemisia leucodes: **Russian:** Полынь беловатая (Polyn' belovataya) (Ketskhoveli et al. 1971–2011; Makashvili 1991; Sokolov 1993)

Artemisia scoparia: **Russian:** Полынь метельчатая (Polyn' metyol'chataya); **English:** redstem wormwood (Ketskhoveli et al. 1971–2011; Makashvili 1991; Sokolov 1993)

Artemisia vulgaris: **Georgian:** ჯორთკუდა (jortk'uda), ავშანი (avshani); **Svan:** ველური ტარხუნა (veluri t'arkhuna); **Russian:** Полынь обыкновенная (Polyn' obyknovennaya); **English:** common mugwort (Ketskhoveli et al. 1971–2011; Makashvili 1991; Sokolov 1993)

Eclipta prostrata: **Russian:** Полынь зеленая (Polyn' zelyonaya); **Kyrgyz:** Мамыр шыбак (Mamyr shybak); **English:** wormwood (Ketskhoveli et al. 1971–2011; Makashvili 1991; Sokolov 1993)

Botany and Ecology

Artemisia absinthium: Perennial. Whole plant grayish from short approximate hairs, sericeous-tomentose. Root vertical, thick, perennial. Stem 60–100 cm high, herbaceous, erect, with short branches, leafy, sometimes basally with short nonflowering branches bearing long-petiolate leaves. Leaves with 6–9 cm long and 3–7 cm wide lamina broadly ovate, almost thrice pinnately dissected, terminal lobe lanceolate, short-acuminate; middle cauline leaves short petiolate, lacking lobes at base of petiole, twice pinnately dissected; upper leaves subsessile, simple pinnate or twice ternate; bracteal leaves ternate or simple, undivided, narrowly lanceolate; lobes of all leaves linear-oblong, scarcely acuminate, undivided or with few teeth, usually 3–20 mm long and 1–4 mm wide. Capitula globose, 2.5–3.5 mm in diameter, drooping or spreading into narrowly panicate inflorescence. Involucral bracts oblong-ovate, outer almost as long as inner bracts, hairy on spine, with wide scarious margin. Receptacle convex, hairy. Peripheral florets pistillate, usually 25, their corollas filiform-tubular; stigma lobes exserted from tube, linear, arcuate; disk florets numerous (usually 60), their corollas conical, glabrous, sometimes weakly hairy; anthers linear, apical appendages of anthers obtusely angular, with round apex, basal appendages short, obtuse; stigma lobes broadly linear, after flowering somewhat curved. Achenes about 1 mm long, oblong-cuneate, rather flat, finely sulcate, with a round, slightly convex at apex. Flowering July to August. Ural, Caucasus, Altai, Middle Asia, in meadows, steppes; on river banks, forest margins, fields, rocky areas; in crops and fields; in gardens; along irrigation ditches; around settlements as weed; on recent fallow lands; near roads and dwellings; in kitchen gardens and gardens; less often in crop fields, meadows, pastures, and forest edge; in forest, forest steppe, and steppe zones; as well as in mountains (Shishkin and Boborov 1961; Figs. 1, 2, and 3).

Fig. 1 *Artemisia absinthium* (Asteraceae), Cappadocia, Turkey. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)



Fig. 2 *Artemisia absinthium* (Asteraceae), Kartli, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)

Fig. 3 *Artemisia absinthium* (Asteraceae), Svaneti, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)



Artemisia annua: Annual. Plant aromatic, green, glabrous, or with scattered, small, approximate hairs. Stems erect, ribbed, brownish or violet-brown, 30–100 cm high. Leaves alveolate-punctate-glandular; lower leaves petiolate, 3–5 cm long and 2–4 cm wide, ovate, thrice pinnately cut, their lobules oblong-lanceolate, short-acuminate, entire or with 1–2 teeth, 1–2 mm long, and 0.5 mm wide; middle and cauline leaves twice pinnately cut; upper leaves sessile smaller and less compound; uppermost leaves bracteal, simple, or with fewer lateral lobes. Capitula globose, 2.0–2.5 mm in diameter, numerous, divergent or drooping, on short peduncles, approximate on short branches, usually in long pyramidal paniculate inflorescence. Involucre glabrous. Outer involucral bracts linear-oblong, green; inner oval or almost round, with wide scarious border, lustrous. Receptacle convex, glabrous. Peripheral florets pistillate, 10–20, filiform, punctate-glandular; their stigma lobes narrowly linear, obtuse, exerted from corolla tube; disk florets bisexual, 12–30, their corollas cup-shaped tubular, glabrous; anthers narrowly linear, apical appendages of anthers long, acute, basal appendages very short, subacute; style shorter than stamens, stigma lobes linear, straight, weakly divergent, apically ciliate. Achenes 0.8–0.6 mm long, oblongovate, flattened, with small round areola at apex, scarcely bordered. Flowering August–September. Ural, Caucasus, Altai, Middle Asia, in meadows, sandy areas, on rocks, solonchous steppes, flood-plain forests, river valleys and on their shores, fields, near settlements, along roads as weed (Shishkin and Boborov 1961).

Artemisia dracunculus: Perennial. Rhizome woody, 0.5–1.5 cm thick, sparsely covered with rootlets and sometimes with well-developed stolons; whole plant glabrous, smooth, green, less often hairy when young. Stems erect, solitary or few, 20–150 cm high, ribbed, usually branched, lower branches sterile. Leaves undivided, linear-lanceolate or almost linear, 1.5–8.0 cm long and 1–10(14) mm wide; lowermost cauline leaves sometimes with three lobes at apex. Capitula numerous, globose, drooping, (2)2.5–4.0 mm in dia, at apices of stem and branches in racemes, forming paniculate inflorescence. Involucral bracts smooth, outer bracts oblong or sublanceolate, inner bracts round-oval, with wide scarious margin. Peripheral florets pistillate, usually seven; their corollas tubular, expanded toward base; stigma lobes narrowly linear, subacute, exerted from corolla tube, divergent; disk florets staminate, 11–14, their corollas conical, with five teeth; anthers linear, apical appendages of anthers obtuse-angled, subacute, basal appendages shorter, subobtuse; stigma of abortive pistil not lobed, funnel-shaped at apex. Achenes small, 0.6 mm long, somewhat flat, ovoid, finely sulcate, brown. Flowering July–August. Ural, Caucasus, Altai, Middle Asia, alkaline meadows, near birch groves, river terraces of meadows, steep valley slopes and old fallow lands, forest steppe and steppe zones, as well as meadow slopes, on solonchouk soils, floodplain meadows, forest edges, forests, thickets in steppes, meadow steppes, along river banks, river terraces, stony slopes, to the upper mountain belt, sometimes as weed. Widely planted in kitchen gardens (Shishkin and Boborov 1961; Figs. 4, 5, 6, and 7).

Artemisia leucodes: Biennial or annual. Densely covered with white, long, semi-erect hairs up to end of vegetative period. Root slender, vertical. Stems solitary or few, 30–60(70) cm high, 2–5 mm thick, erect, branched almost from base or in lower half, with more or less straight, upwardly directed branches. Lower cauline leaves petiolate, 3–7 cm long and 2.5–4.0 cm wide, with petioles as long as or longer than lamina, divided up to base into three palmately or pinnately parted lobes; terminal lobes lanceolate-linear, acute, 5–10 mm long and 1.0–1.5 mm wide; middle cauline leaves sessile, like auricles divided into ternate, simple, linear lobes; uppermost leaves undivided, sessile, linear-lanceolate. Capitula in lax spreading panicle, remote, less often approximate, 2–3, sessile, upright, ovoid-oblong, 5–7 mm long. Involucral

Fig. 4 *Artemisia dracunculus* (Asteraceae), Svaneti, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)



Fig. 5 *Artemisia dracunculus* (Asteraceae), Svaneti, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)



Fig. 6 *Artemisia dracunculus* (Asteraceae), Svaneti, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)

Fig. 7 *Artemisia dracunculus* (Asteraceae), Svaneti, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)



bracts, excluding innermost, pubescent, outer bracts small, broadly deltoid or oval, inner larger, broadly lanceolate or oblong, with narrow, brown scarious border. Middle Asia, desert sands, as well as outcrops of sandstones and different gypsiferous deposits. On sandy, gravelly, clayey slopes (Shishkin and Boborov 1961).

***Artemisia scoparia*:** Annual or biennial. Root slender, straight, vertical. Stem 30–70 cm high, solitary, less often 2–3, erect, pubescent, later glabrous, reddish-violet or brown, strongly branched in middle and upper parts, with divergent branches. Young leaves pubescent, older ones glabrous; lower leaves petiolate, twice or thrice pinnately incised into linear lanceolate-acute lobes, withering before anthesis; middle cauline leaves sessile, 1–4 cm long, with narrowly linear or filiform-linear lobes. Capitula small, 1.5–2.0 mm long, ovate or broadly ovate, on short peduncles, divergent or drooping, on branches in secondary racemes forming pyramidal panicle. Involucral bracts glabrous, with scarious margin; upper bracts oval, inner larger, green, oblong or broadly lanceolate, glabrous, glaucous. Peripheral florets pistillate, 6, their corollas narrowly tubular, stigma lobes narrowly linear, acuminate, divergent; disk florets 6, staminate, their corollas conical, anthers linear, stigma of abortive pistil not lobed. Achenes 0.6 mm long, ovoid, somewhat flat, finely ribbed, brown. Flowering August. Ural, Caucasus, Altai, Middle Asia, alkaline steppe meadows, light sandy loamy and sandy soils, as weed in fields, pastures, old fields, open pine groves, and also in irrigated fields, along river valleys on rubbly slopes, in forest steppe and desert zones, and also in lower mountain zone in steppes (Shishkin and Boborov 1961).

Artemisia vulgaris: Perennial. Rhizome strong, in upper part thickened; stem herbaceous, erect, (45)65–160 cm high, angular-ribbed, more or less branched, usually brownish-violet, leafy, weakly hairy. Leaves green above, glabrous or not densely arachnoid hairy, grayish, arachnoid hairy beneath, lower-most leaves petiolate, rest sessile, 3–15 cm long and 1.5–11 cm wide, deeply pinnately dissected or pinnately cut into elliptical-lanceolate or linear-lanceolate, usually deeply incised or toothed, lobes 1–10 cm long and 2.5 cm wide; upper leaves small, floral bracts entire, linear. Capitula oblong or narrowly campanulate, 3–4 mm long and 1.5–3.0 mm in diameter, slightly inclined, less often almost drooping, in dense racemes on secondary branches forming in general, more or less narrow or rather wide panicle. Involucre arachnoid hairy, involucre bracts scarious along margin, outer bracts ovate, acuminate, inner bracts longer, elliptical, obtuse. Receptacle convex. Peripheral pistillate florets 7–10; their corollas narrowly tubular, stigma lobes narrowly linear, straight, erect; disk florets bisexual, (5)8–20, their corollas narrow, cup-shaped conical, smooth, reddish-brownish; anthers linear, on rather long filaments, apical appendages of anthers acute, basal appendages subacute; stigma lobes at maturity slightly exerted from tube, arcuate, thickened upward, truncate, with long dense cilia. Ural, Caucasus, Altai, Middle Asia, forest, partly forest steppe and steppe zones, in coniferous-deciduous open deciduous forests, around forest glades, edges of forests, river valleys, ravins, gullies, mountain slopes, meadows, scrubs, fallow lands, near fields and dwellings, to the upper mountain belt, often as weed. Often cultivated (Shishkin and Boborov 1961).

Eclipta prostrata: Annual. Stem 10–50 cm high, usually branched from base, ascending or prostrate, with fine appressed hairs, more densely above. Leaves oblong-lanceolate or oblong, sessile, serrate-toothed, teeth directed upward, sometimes only sinuate, covered with numerous fine appressed hairs. Capitula 6–8 mm wide; involucre of oblong, long, outer bracts and shorter, oblong-lanceolate, inner bracts; involucre bracts covered with fine appressed hairs, with thick, light-colored (yellowish), longitudinal veins. Ligulate florets short, half as long as involucre; bracts setose, ventrally pubescent. Achenes prismatic, somewhat swollen above, 2–3 mm long, 1.0–1.5 mm wide, smooth, without tubercles or sometimes with few inconspicuous tubercles along fine ventral rib, dark grayish brown, along edges fringed, light yellowish brown. Flowering June. Ural, Caucasus, Altai, Middle Asia, meadows, steppes, river valleys, forests, sandy shores, gravelly slopes, rocks, fields, near settlements, as weed (Shishkin and Boborov 1961).

Phytochemistry

Artemisia absinthium: Cyclitols (quiberachite), organic acids, essential oils (cadinene, guaiazulene, ketopelenolide a, ketopelenolide b, hydroxyketopelenolide, caryophyllene, selenene, α -pinene, nerol, thujone, tujol, p -cymene, camphene, cineole, phellandrene, geraniol, elemol, α -chymachalene, α -cadinene, limonene, eucalyptol, γ -terpinene, linalool, isoborneol, camphor, α -bizabolol, hamazulene, methylhamazulene, ethylhamazulene, tuyen, sabinene, α -terpinene, ocimene, terpinolene, n -hexanol, nonanal, farnesene, lavandulol, α -curcumine, germacrene D, sabinol),

sesquiterpenoids (absintine, anabsintine, artamarine, artamaridine, artamaridinine, artamarinin, artabsine, artbine, arabsine, anabsine, artemoline, absintolide, isoabsintine, ketopelenolide, artbine, arabine, arlatine, arenolide, parsirIn B, parsherIn C), lignans (lyrioresinol A, lyrioresinol C, sezartemine, episazartemIn A, episepartemIn B, diazezartemine, sesamin, epieudesmine, fargesine, yangambin, epiangambine, diayangambine, askhantine, epiaschantine), flavonoids (artemetine, quercetin, kaempferol, isoramnetine, apigenin), fatty acids (lauric, myristic, palmitic, stearic, oleic, linoleic, arachidic), carbohydrates (inulin), polyacetylene compounds, phenolcarboxylic acids, vitamins (C), steroids, coumarins (scopoletin, umbelliferon), fatty acids (lauric, myristic, palmitic, stearic, oleic, linoleic, arachidic), tannins (Sokolov 1993).

Artemisia dracunculus: Essential oils (sabinene, methylhavicol, eugeol, cis-ocimene, trans-ocimene, cis-allocymene, trans-allocymene, linalool, limonene, geraniol, a-tuyen, a-pinene, p-pinene, camphene, sabinene, a-terpinene, p-cymol, y-terpene, trans-sabinenhydrate, cis-sabinenhydrate, terpinolene, terpinol, citronellyl acetate, geranyl acetate, methyl eugenol, elemyine, farnesene, spatulenol), phenylcarboxylic acids (coffee, chlorogenic, vanilline), coumarins (herniarin, artidine, aridiodiol, arethynol, scocarone, scopoletin, isocoumarin), flavonoids (quercetin, hyperoside, luteolin, kaempferol, biokovertsetine, rutine), steroids, tannins (Sokolov 1993).

Artemisia annua/leucodes/vulgaris: Essential oils (cineole, limonene, terpinolene, fenchone, citral a, citral b, geraniol, aromadendrene, linalool, thujone, a-pinene, p-pinene, myrcene, p-cymol, a-thujone, p-thujone, camphor, terpinol-4, a-copene, caryophyllene, a-terpineol, borneol, bornylacetate, y-cadinene, vulgarol, camphene, a-terpinene, artemisia ketone, isoborneol), sesquiterpenoids (psilostahyine, psilostahyIn B and C), triterpenoids (a-amyrin, fernenol), steroids (sitosterol, stimasterine), coumarins (esculine, esculetin, umbelliferone, scopoletin, methylenedioxycoumarin) (Sokolov 1993).

Artemisia scoparia: Essential oils (a-pinene, cineole, carvone, thujone, cadinene, furfural, caryophyllene, eugenol, isoeugenol, methyleugenol, sabinene, camphene, a-flalandrene, p-flalandrane, limonene, p-cymol, longicylen, longifene, santalene, a-chymachalene, 6-bisabolene, 6-cadinene, curcumin, camphor, carvone, linalool, borneol, thymol, cis-eugenol, trans-eugenol, scoparone, myrcene, cadinene, isoeugenol), phenylcarboxylic acids (chlorogenic), coumarins (scoparone, dimethoxycoumarin, esketine, scopoletin), flavonoids (methyl aromodendrin, ramnocitrine, eupalinine, cirsimaritin, eupatholithine, rutine, quercetin, kappeprol), organic acids (oxalic), steroids (sitosterol), tannins (Sokolov 1993).

Local Medicinal Uses

Artemisia absinthium: In the Ural the species is used for cancer of the liver, stomach, spleen, uterus, and leukemia. The root infusion is used for rheumatism and arthritis. In the Altai and Middle Asia, the leaves are used to treat lung diseases, angina, intestinal colics, tuberculosis, respiratory infections, and rhinitis. In the

Northern Caucasus, the leaves decoction is used to treat gonorrhoea and in Armenia for diabetes mellitus. The flower infusion is used to treat ulcers of the intestine, epilepsy, hemorrhoids, fever, diarrhoea, and enterocolitis and is in Azerbaijan used for furuncles. Tincture is used as appetizer and digestion facilitator and anthelmintic and for wound healing (Grossheim 1952; Sokolov 1993). *Artemisia absinthium* is considered tonic, appetizer, digestion stimulant, menstruation regulator, anthelmintic, diuretic, and antipyretic (Mozaffarian 2013). In Turkmen Sahra area, decoction of leaves and flowering heads are used for constipation in children, as laxative and for intestinal parasites (Ghorbani 2005). Also, condensed decoction is used externally as poultice to relief body pains and constipation in children (Ghorbani 2005).

The leaf extract is used to treat colds and flu, sore throat, and bedwetting in children. Leaves and stems are used as sedative, as aphrodisiac and to increase the appetite, and for their antibiotic properties (Bussmann et al. 2016a, b, 2017, 2018).

***Artemisia dracunculus*:** In the Ural the leaves are used as poultice for eczema and burns and internally for tuberculosis, pneumonia, and bronchitis (Sokolov 1993). The leaves and roots are used as digestive (Bussmann et al. 2016a, b, 2017, 2018).

***Artemisia annua/leucodes/vulgaris*:** Traditionally *Artemisia vulgaris* is used in the Ural as anthelmintic, for intestinal colics, diarrhoea, and gastralgia. The extract and fresh leaves are also applied externally on wounds and burns. In the Altai extracts are used for testicle and uterus cancer. In Azerbaijan an extract is used to treat fractures. In the Northern Caucasus and parts of the Ural, *Artemisia annua* leaves are used as anthelmintic, for respiratory infections, fever, dysentery, and externally for rheumatism and scabies (Sokolov 1993).

***Artemisia vulgaris*:** The leaves are used as diuretic and to treat gallbladder problems. The extract also serves to kill lice (Bussmann et al. 2016a, b, 2017, 2018).

***Artemisia scoparia*:** In the Ural the leaves are used to treat tuberculosis, pneumonia, bronchitis, laryngitis, pharyngitis, angina, with liver disease, fever, anemia, rheumatism, and as anthelmintic. The leaf ash is used as expectorant (Sokolov 1993).

Local Food Uses

***Artemisia absinthium*:** The leaves are used as spice, especially to produce aromatic liqueur, and as bitter agent in the production of beer. In the Talysh, and in other areas of the Caucasus, the leaves are used as a seasoning for food (Grossheim 1952). In the Talysh, and in other areas of the Caucasus, the leaves are used as a seasoning for food (Grossheim 1952; Sokolov 1993). The leaves are used as food (Bussmann et al. 2016a, b, 2017, 2018; Fig. 8).

***Artemisia dracunculus*:** The leaves are used in cheese production, as spice and for salads, and to make lemonade. Well-known spice is used as a seasoning for salads (Grossheim 1952; Sokolov 1993). The leaves and fruits are eaten and used as spice, especially for meat, added either while cooking or fresh (Bussmann et al. 2016a, b, 2017, 2018; Figs. 9 and 10).

Fig. 8 *Artemisia absinthium* (Asteraceae), drying for winter, Tusheti, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)



Fig. 9 *Artemisia dracunculus* (Asteraceae), ready to eat, Svaneti, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)



Artemisia annua/leucodes/vulgaris: The leaves are used as flavoring agent for liquors and as spice for cooking. In Khevi many species are mixed together for Pkhali: ghoris nats'q'la-ი ღორის ნაწყლა-ი *Sonchus* ssp., mch'ivana-ი მჭივანა-ი *Silene wallichiana* Klotzsch; maq'randutsa-ი მაყრანდუცა-ი *Anthriscus sylvestris* (L.) Hoffm. maq'rats'elამყრატსელა-ი; diq'inch'ora-ghrich'ola დიყინჭორა-ღრინჭოლა/ქ'q'imi'ჭყიმი *Anthriscus nemorosa* (M. Bieb.) Spreng; k'ats'a-ი კაწა-ი *Campanula*

Fig. 10 *Artemisia dracunculus* (Asteraceae), leaves ready to eat, Tusheti, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)



rapunculoides L. (its root is also edible), ts'iteli pkhali წითელი/ქვილაკა წითელი ჯიჯილაყა *Amaranthus hybridus* L., nadirmkhalai ნადირმხალაი *Aruncus vulgaris* Raf., saskhep'iai სასხეპიაი *Chaerophyllum bulbosum* L., ch'inch'ari ჩინჭარი *Urtica dioica* L., gholo ღოლო *Rumex* ssp., tatami თათამას *Atriplex hortensis* L. Khevi people use as food the following plants: shalgi შალგი *Brassica campestris* L., khakhot'i ხახოტი *Bunias orientalis* L., mamula მამულა *Artemisia vulgaris* L., ts'its'mat'ura წიწმატურა *Capsella bursa-pastoris* (L.) Medik., and khboshublai ხბოშუბლაი *Galega orientalis* Lam (Bakhtadze and Koghuashvili 2009; Kavtaradze 1985; Sujashvili and Pitshelauri 2005).

In Tusheti many herbaceous plants are used as food and are kept for winter, either dried or pickled, to make mixed mkhali and sauces and to accompany the main dishes, including kumeli ქუმელი q'va ყვა. It is used all-year round and is made of roasted keru ქერი (barley) grains. Can be made of ipkli იქლი (Georgian endemic wheat), corn, svili სვილი (rye), kersvili კერსვილი (mixture of barley and rye), and tsetsvi ცერცივი faba bean), when mixed with corn: giera-i გიერა-ი *Brassica campestris* subsp. *oleifera* (DC.) Schübl. & Mart., gomat'i გომატი *Bunias orientalis* L., dutsi დუცი *Angelica tatianae* Bordz., kharnuq'a-ი ხარნუყა-ი *Lactuca serriola* L., buera ბუერა *Petasites* ssp., shubq'a-ი შუბყა-ი *Heracleum asperum* M. Bieb., khap'ara-ი ხაპარა-ი *Cichorium intybus* L., mariamdzmara მარიამძმარა *Ligusticum*

alatum (M. Bieb.) Spreng., ch'imi ჭიმი *Chaerophyllum bulbosum* L., diq'i დიცი *Heracleum* ssp., jork'uda-ი ჯორთკუდა-ი *Artemisia vulgaris* L., sagvidzla საღვიძლა *Taraxacum officinale* (L.) Weber ex F.H. Wigg., dzirkhvena ძირხვენა *Arctium lappa* L., ch'ivana ჭივანა *Silene wallichiana* Klotzsch, kvishamkhala ქვიშამხალა *Silene laera* (Stev.) Sims, khavrat'ai ხავრატაი *Capsella bursa-pastoris* (L.) Medik., jorik'udai ჯორიკუდაი *Artemisia vulgaris* L., and giera გიერა *Sinapis arvensis* L. (Makalatia 1933; Bochoridze 1993; Kurdghelaidze 1983; Maghalashvili 1970). There are several ways to season mkhali in Tusheti: (1) well-cleaned plants are placed in a pot and cooked without water. The cooked plants are placed on a sieve to cool and cut into pieces. After that the dish is seasoned with onions browned in clarified butter, eggs, and salt. (2) After cooking the plants in the same way, fresh cottage cheese, onions browned in clarified butter, eggs, and salt are added. (3) After boiling the mkhali is seasoned with vinegar, garlic, and salt. Normally, in Tusheti mkhali is not seasoned with walnuts and vinegar (Makalatia 1933).

In Tusheti ch'imi ჭიმი *Chaerophyllum bulbosum* L., giera გიერა *Brassica campestris* subsp. *oleifera* (DC.) Schübl. & Mart., machigt'ara მაჩიგტარა *Campanula rapunculoides* L., khap'ara ხაპარა (ვარდკაჭაჭა) *Cichorium intybus* L., diq'i დიცი *Heracleum* ssp., shup'q'a შუპყა *Heracleum asperum* M. Bieb., ap'q'i აპყი *Heracleum leskovii* Grossh., dutsi დუცი *Angelica tatianae* Bordz, giera გიერა *Sinapis arvensis* L., jork'uda ჯორთკუდა (wild estragon) *Artemisia vulgaris* L., mariamdzmara მარიამძმარა *Ligusticum alatum* (M. Bieb.) Spreng., and kharnuq'a ხარნუყა *Lactuca serriola* L. are eaten raw and also dipped in sour milk (Makalatia 1933; Oshoradze 1969). These herbaceous plants for dipping (sats'ebaci, sats'ebi “chatseba” means “dip” in Georgian) are harvested, and a bowl with curd “shegdebul ze” “შეგდებულ ზე” is filled; and then leaves and young shoots from the mentioned herbaceous plants are plucked, dipped in the curd, and eaten.

In Kartili young shoots of telkharshi თელხარში *Heracleum leskovii* Grossh., melidzvala მელიძვალა *Serratula quinquefolia* M. Bieb. ex Willd, and saptskvnela საფცქვნელა *Artemisia vulgaris* L. are peeled and eaten (Berozashvili et al. 1981).

***Artemisia annua*:** The leaves and fruits are eaten and used as spice, especially for meat, added either while cooking or fresh (Bussmann et al. 2016a, b, 2017, 2018).

***Artemisia vulgaris*:** The leaves are used as spice for Sats'ebai (Bussmann et al. 2016a, b, 2017, 2018).

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***Artemisia* sp.:** The stems and leaves are dried and used as brooms (Bussmann et al. 2016a, b, 2017, 2018).

***Artemisia absinthium*:** As fodder for sheep and rabbits. The plant is browsed by cows but gives the milk a very unpleasant taste. The leaves yield lemon yellow, dark green, and olive dyes for wool and silk. Planted as ornamental. Toxic, causes dermatoses when crushing and grinding the plant (Sokolov 1993). The leaves and stems are given rabbits to treat toothache. The leaves serve to treat fever in animals and serve as antibiotic (Bussmann et al. 2016a, b, 2017, 2018).

Artemisia dracunculus: Fodder for cattle, horses, and camels. Planted also as ornamental (Sokolov 1993).

Artemisia annua/leucodes/vulgaris: Fodder for livestock, especially sheep. Goats and camels. A yellow dye for wool is produced from the leaves. Planted as ornamental (Sokolov 1993).

Artemisia annua: The leaf extract serves to treat wounds in animals and as insect repellent (Bussmann et al. 2016a, b, 2017, 2018).

Artemisia scoparia: Fodder for small livestock. Used as ornamental (Sokolov 1993).

In general good silage is obtained from species of wormwood, and the consumption of this does not affect the quality of milk and butter that occurs when animals eat wormwood fresh. Wormwood oils are suitable for soap making (Grossheim 1952; Sokolov 1993).

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