Angelica adzharica Pimenov
Angelica tatianae Bordz.
Apiaceae

Rainer W. Bussmann, Ketevan Batsatsashvili, Zaal Kikvidze, Narel Y. Paniagua-Zambrana, Manana Khutsishvili, Inesa Maisaia, Shalva Sikharulidze, and David Tchelidze

Synonyms

***Angelica tatianae* Bordz.:** *Xanthogalum tatianae* Schischk.

Local Names

Georgian: ანგელოზა (angeloza); **Russian:** Дудник (dudnik); **Armenian:** кех (Grossheim 1952; Ketskhoveli et al. 1971–2011; Makashvili 1991; Sokolov 1988).

R. W. Bussmann (✉)
Department of Ethnobotany, Institute of Botany and Bakuriani Alpine Botanical Garden, Ilia State University, Tbilisi, Georgia

Saving Knowledge, La Paz, Bolivia
e-mail: rainer.bussmann@iliauni.edu.ge

K. Batsatsashvili · M. Khutsishvili · I. Maisaia · S. Sikharulidze · D. Tchelidze
Department of Ethnobotany, Institute of Botany and Bakuriani Alpine Botanical Garden, Ilia State University, Tbilisi, Georgia
e-mail: ketevan_batt@yahoo.com; mananakhuts@yahoo.com; Inesa.Maisaia@gmail.com; bakurianigarden@yahoo.com; nickibakanidze@yahoo.de

Z. Kikvidze
4-D Research Institute, Ilia State University, Tbilisi, Georgia
e-mail: zaal.kikvidze@iliauni.edu.ge

N. Y. Paniagua-Zambrana
Department of Ethnobotany, Institute of Botany and Bakuriani Alpine Botanical Garden, Ilia State University, Tbilisi, Georgia

Saving Knowledge, La Paz, Bolivia

Herbario Nacionál de Bolivia, Universidad Mayor de San Andrés, La Paz, Bolivia
e-mail: nyaroslava@yahoo.es

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Botany and Ecology

Perennials; stem 100–120 cm tall, with whorled branches above, hollow, to 1 cm wide, glabrous, scabrous-hairy only under umbels; radical leaves on thick short cylindrical petioles, shorter than broadly triangular, ternately pinnate, ca. 30 cm long and almost equally wide blade; primary lobes broadly ovate, 20–25 cm long, 10–15 cm wide, deeply pinnatifid into ovate acute lobules 6–8 cm long, 3–5 cm wide, short-haired beneath and along margins, unequally acutely toothed, slightly scabrous along nerves above, cauline leaves sessile on strongly inflated sheath hairy outside along nerves; blade ternately parted with pinnate lobes of the second order, terminal lobes oblong-lanceolate, acuminate, 10–12 cm long, 2–3.5 cm wide; reduced in upper leaves. Umbels 10–15 cm across, of 25–35 unequal rays, scabrous above, spreading at flowering, more or less crowded in fruit; involucre absent; umbellets 10–15 mm across; involucels of 3–5 subulate or filiform, caducous leaflets; petals yellowish-greenish, acute or slightly notched, ca. 1 mm long; stylopodium short-conical, with undulant-notched edge; styles reflexed, slightly longer than stylopodium; fruit (young) broadly ovoid, 6 mm long, 5 mm wide; dorsal ribs narrowly, marginal broadly winged. Flowering July, fruiting August. Caucasus, in tall-grass meadows, *Betula* forests (Shishkin 1951) (Figs. 1, 2, 3, 4, and 5).

Phytochemistry

Carbohydrates (umbelliferosis), essential oils (a-thuyen, a-pinene, camphene, p-cymol, cineole, y-terpinene, 3-thujone, camphor, 3-phellandrene, a-fellandren, borneol, 3-fellandren, 3-carene, limonene, cis-ozymene, p-cymene, 3-pinene, sabinene,

Fig. 1 *Angelica adjarica* (Apiaceae), Adjara, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)

Fig. 2 *Angelica adjarica* (Apiaceae), Adjara, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)

Fig. 3 *Angelica adjarica* (Apiaceae), Adjara, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)

terpinolene, y-terpinene, a-fenghon, trans-ocimene, cis-alloocymene, trans-alloocymen, santen, carvacrol, pentadecanolide, linalool, bisabolene, bizabolol, 3-caryophyllene, 3-terpineol, 2-nitro-p-mentadien, cis-6-nitro-p-mentadien), organic acids (malic, angelic, acetic, wine, aconite, lemon, oxalate), terpenoids, steroids (sitosterol, arachinate-a-sitosterine), phenylcarboxylic acids (coffee, chlorogenic, protocatechal), coumarins (umbellipeline, ostenol, xanthatexol, xanthatexine, emperorin, oxypexeden, angelicine,

Fig. 4 *Angelica adjarica* (Apiaceae), Adjara, Georgia. (Photo R.W. Bussmann & N.Y. Paniagua-Zambrana)

archangeline, oroscelon, umbelliferon, archicine), flavonoids (quercetine), macrocyclic lactones (exaltolide, canolide, heptadecanolide, decanolide), fatty acids (behenic, palmitic, lauric, tridecanoic, myristic, pentadecanoic, stearic, oleic, linoleic, linolenic acids), vitamins (C), (angelitsin, emperorin, isopimpinellin, xanthotoxine, oxypeucedanin) (Sokolov 1988).

Local Medicinal Uses

Angelica is included in a variety of official herbal pharmacopoeia. In the Ural the roots are used as diuretic and expectorant for bronchitis, neurasthenia, insomnia, gastritis, and ascites and as tincture for rheumatism, gout, sciatica, as well as otitis and toothache (Sokolov 1988).

Local Food Uses

The young shoots are eaten raw and pickled. The seeds are used as spice. In Northern Armenia it is highly valued as an edible plant. The leaf petioles with spicy bitter taste are eaten raw, rarely salted (*Jaroshenko*) and probably also have medicinal properties (Grossheim 1952; Sokolov 1988).

In Khevsureti dutsi დუცი (*Angelica tatianae* Bordz.) petioles are peeled and used as food.

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

Fig. 5 *Angelica archangelica* (Apiaceae), Abisko, Sweden. (Photo R.W. Bussmann)

dishes, including kumeli ქუმელი q'va ყვა. It is used all-year round and is made of roasted keri ქერი (barley) grains. Can be made of ipkli იფქლი (Georgian endemic wheat), corn, svili სვილი (rye), kersvili ქერსვილი (mixture of barley and rye) and tertsvi ცერცვი (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-i ხარნუყა-ი *Lactuca serriola* L., buera ბუერა *Petasites* ssp., shubq'a-i შუბყა-ი *Heracleum asperum* M. Bieb., khap'ara-i ხაპარა-ი *Cichorium intybus* L., mariamdzmara მარიამძმარა *Ligusticum alatum* (M. Bieb.) Spreng. ch'imi ჭიმი *Chaerophyllum bulbosum* L., diq'i დიყი *Heracleum* ssp., jortk'uda-i 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). 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 and 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).

Chave ჩავე is made in Tusheti using saghvidzlia საღვიძლია or sajaraq'i საჯარაყი *Taraxacum officinale* (L.) Weber ex F.H. Wigg., gomat'i გომატი *Bunias orientalis* L., dutsi დუცი *Angelica tatianae* Bordz., kharnuq'a ხარნუყა *Lactuca serriola* L. (another name is mts'aria მწარია because it is bitter; "mts'are" means "bitter" in Georgian), and buera ბუერა *Petasites* ssp., p'it'na პიტნა *Mentha* ssp., gholo ღოლო *Rumex* ssp., sasuka სასუქა *Seseli transcaucasicum* Pimenov & Sdobnina, vashlisula ვაშლისულა *Primula woronowii* Losinsk., boiled together, with added milk, sach'irai საჭარაი (sheep internal fat), and flour thinned with milk or water, as well as salt and garlic.

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 დიყი *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., jortk'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. These herbaceous plants for dipping (sats'ebaci, sats'ebi "chatseba" means "dip" in Georgian) are harvested, and a bowl with curd "shegdebul ze" "შეგდებულზე" is filled; then leaves and young shoots from the mentioned herbaceous plants are plucked, dipped in the curd, and eaten (Sokolov 1988).

Local Handicraft and Other Uses

The essential oils are used for perfumes (Sokolov 1988).

The young stems are eaten as pickle (Bussmann et al. 2016, 2017).

Angelica glauca is used in Nepal for the treatment of asthma, cough and colds (Kunwar et al. 2015, 2016), edema, and gastric problems and as anthelminthic (Thakur et al. 2014). The roots of *Angelica archangelica* are used for gastric problems (Kunwar and Bussmann 2009; Kunwar et al. 2009, 2013, 2018a, b) and as anthelminthic and for stomachache (Kunwar et al. 2010).

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