

- Calyx shorter, 15—27 mm. Petals pink . . . . . 22.
22. Epicalyx scales 6—8, abruptly tapered into acicular apex 1.5—2 mm. Shortened sterile shoots absent. Petals densely barbate. Stems 20—40 cm . . . . . 21. **D. martuniensis** M. Kuzmina
- Epicalyx scales 4—14, without acicular apices. Shortened sterile shoots present. Petals ebarbate or rarely barbate. Stems 10—30 cm . . . . . 20. **D. orientalis** Adams
- i. Epicalyx scales (4) 6—8 (14), imbricate . . . . . ii
- Epicalyx scales (4) 6, not imbricate . . . . . iii
- ii. Epicalyx scales (4) 6—8 (10), acuminate or gradually tapered into short apex. Stems not virgate . . . . . 20a. subsp. **orientalis**
- Epicalyx scales 8—12 (14), shortly mucronate. Stems virgate . . . . . 20b. subsp. **aphanoneurus** Rech. f.
- iii. Epicalyx scales roundish or emarginated at the apex, acuminate. Calyx 15—20 mm. Petal limb oblong-cuneate, ebarbate . . . . . 20d. subsp. **obtusisquameus** (Boiss.) Rech. f.
- Epicalyx scales abruptly mucronate. Calyx 20—25 mm. Petal limb obovate, barbate . . . . . 20c. subsp. **nassireddinii** Stapf

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### OGANESIAN M. E.

### GENUS ACANTHOLIMON BOISS. (PLUMBAGINACEAE) IN SOUTH TRANSCAUCASIA (ARMENIA, NAKHICHEVAN)

Instead of 19 species cited for South Transcaucasia (Мирзоева, 1956, 1981; Тамашян, 1967) we count 15. Two species have been described new to science, *A. manakyanii* and *A. takhtajanii*, the latter was previously wrongly identified by Caucasian authors as *A. armenum* Boiss. or *A. balansae* (Boiss. & Huet) Bunge. Two species (*A. festucaceum* (Jaub. & Spach) Boiss. and *A. tenuiflorum* Boiss.) are new for the flora of Armenia and South Transcaucasia. Nine species (*A. avenaceum* Bunge, *A. calvertii* Boiss., *A. lepturoides* (Jaub. & Spach) Boiss., *A. acerosum* (Willd.) Boiss., *A. puberulum* Boiss. & Balansa, *A. echinus* (L.) Boiss., *A. quinquelobum* Bunge, *A. armenum* Boiss., *A. scorpius* (Jaub. & Spach) Boiss.) have been excluded from the floras of the Caucasus or South Transcaucasia. The species cited as *A. scorpius* (Гроссгейм, 1939) and not mentioned afterwards by С. Г. Тамашян (1967) is identified as *A. tragacanthinum* (Jaub. & Spach) Boiss. The lectotype of *A. veditum* Mirzoeva has been designated. A checklist of the genus in South Transcaucasia and a key to the species are enclosed.

*Acantholimon*, taxonomy, new species, South Transcaucasia

**Նովահանրիսյան Մ. Է. *Acantholimon* Boiss. ցեղը Հարավային Անդրկովկասում (Նայասարան, Նախիջևան):** Հարավային Անդրկովկասի համար նշված 19 տեսակի փոխարեն (Мирзоева, 1956, 1981; Тамашян, 1967) մենք ընդունում ենք 15-ը: Նկարագրվում է զիրույթյան համար 2 նոր տեսակ՝ *A. manakyanii* և *A. takhtajanii*: Վերջինս Վովկասի բոլոր բուսաբանների կողմից որոշվել է ոչ ճիշդ՝ որպես *A. armenum* Boiss. կամ *A. balansae* (Boiss. & Huet) Bunge. Նայասարանի և Հարավային Անդրկովկասի ֆլորաների համար բերվում են 2 նոր տեսակ (*A. festucaceum* (Jaub. & Spach) Boiss. և *A. tenuiflorum* Boiss.): 9 տեսակ (*A. avenaceum* Bunge, *A. calvertii* Boiss., *A. lepturoides* (Jaub. & Spach) Boiss., *A. acerosum* (Willd.) Boiss., *A. puberulum* Boiss. & Balansa, *A. echinus* (L.) Boiss., *A. quinquelobum* Bunge, *A. armenum* Boiss., *A. scorpius* (Jaub. & Spach) Boiss.) հանվում են Նայասարանի և Հարավային Անդրկովկասի ֆլորաների կազմից: Տեսակ, բերված որպես *A. scorpius* (Гроссгейм, 1939) և չհիշարարված Թ-անամշյանի (Тамашян, 1967) կողմից, մեր կողմից որոշված է որպես *A. tragacanthinum* (Jaub. & Spach) Boiss. *A. veditum* Mirzoeva տեսակի համար առանձնացված է լեկտոտիպ: Աշխարհաբնորոշ բերվում են Հարավային Անդրկովկասում աճող տեսակների կոնսպեկտը և նրանց որոշման բանալին:

*Acantholimon*, կարգաբանություն, նոր տեսակներ, Հարավային Անդրկովկաս

**Оганесян М. Э. Род *Acantholimon* Boiss. в Южном Закавказье (Армения, Нахичеван).** Вместо приводимых для Южного Закавказья 19 видов (Мирзоева, 1956, 1981; Тамашян, 1967) нами принимается 15. Описываются 2 новых для науки вида (*A. manakyanii* и *A. takhtajanii* — вид, ошибочно идентифицируемый всеми кавказскими авторами как *A. armenum* Boiss. или *A. balansae* (Boiss. & Huet) Bunge). 2 вида являются новыми для флор Армении и Южного Закавказья (*A. festucaceum* (Jaub. & Spach) Boiss. и *A. tenuiflorum* Boiss.). 9 видов (*A. avenaceum* Bunge, *A. calvertii* Boiss., *A. lepturoides* (Jaub. & Spach) Boiss., *A. acerosum* (Willd.) Boiss., *A. puberulum* Boiss. & Balansa, *A. echinus* (L.) Boiss., *A. quinquelobum* Bunge, *A. armenum* Boiss., *A. scorpius* (Jaub. & Spach) Boiss.) исключены из флоры Кавказа или Южного Закавказья. Вид, приводимый как *A. scorpius* (Гроссгейм, 1939), и затем не упоминаемый С. Г. Тамашян (1967) определен нами как *A. tragacanthinum* (Jaub. & Spach) Boiss. Избран лектотип вида *A. veditum* Mirzoeva. Приводится конспект рода в Южном Закавказье и ключ для определения видов.

*Acantholimon*, систематика, новые виды, Южное Закавказье

### Introduction

The first significant works on the group, limited to *Statice* L., Subgenus *Armeriastrum* Jaub. & Spach, belong to H. F. Jaubert & E. Spach (1842—1843, 1843). After the description of the genus *Acantholimon* (Boissier, 1846), the first monograph on the genus in whole belongs to A. Bunge (1872). The account of the genus in E. Boissier's "Flora Orientalis" (1875) was monographic in nature. S. Mobayen (1964) investigated the genus worldwide, but incompletely. In particular, he did not investigate the Caucasian material. All the other works on the genus in the Caucasus, Turkey and Iran are either accounts for the regional "Floras" or material for them (Кузнецов, 1902; Гроссгейм, 1932, 1939; Линчевский, 1952; Манденова, 1952; Мирзоева, 1955, 1956; Прилипко, 1957; Тамашян, 1967; Мирзоева,

1972; Bokhari, 1972; Rechinger & Schiman-Czeika, 1974; Мирзоева, 1981; Bokhari & Edmondson, 1982; Assadi, 2005; Doğan & Akaydin, 2007; Оганесян, 2007).

This work began as an account for the “Manual of the vascular plants of Armenia”. Great difficulties in determination of the species led us to investigate all the species in the Caucasus (only three species: *A. lepturoides* (Jaub. & Spach) Boiss., *A. fominii* Kusn. and *A. schemachense* Grossh. grow there outside our list) and many species from Turkey and Iran. Material from the Herbaria ERE, W, TBI, LE was investigated between 2006—2009. It should be noted that Iranian species in the Caucasus are usually smaller and grow at lower altitudes.

Instead of 19 species cited for South Transcaucasia (Мирзоева, 1956, 1981; Тамамшян, 1967) we count 15. Nine species (*A. avenaceum* Bunge, *A. calvertii* Boiss., *A. lepturoides* (Jaub. & Spach) Boiss., *A. acerosum* (Willd.) Boiss., *A. puberulum* Boiss. & Balansa, *A. echinus* (L.) Boiss., *A. quinquelobum* Bunge, *A. armenum* Boiss., *A. scorpius* (Jaub. & Spach) Boiss.) are excluded from the floras of the Caucasus or South Transcaucasia. The species cited as *A. scorpius* (Гроссгейм, 1939) and later not mentioned by С.Г.Тамамшян (1967) is determined as *A. tragacanthinum* (Jaub. & Spach) Boiss. Two species are described new to science (*A. manakyanii* and *A. takhtajanii*, which was previously wrongly determined as *A. armenum* or *A. balansae* (Boiss. & Huet) Bunge). Two species are new for the floras of Armenia and South Transcaucasia: *A. festucaceum* (Jaub. & Spach) Boiss. (Оганесян, 2007) and *A. tenuiflorum* Boiss.).

Additionally, we provide a checklist of the genus in South Transcaucasia (Armenia, Nakhichevan) and a key for determination.

The floristic regions of Armenia are given according to “Flora of Armenia” (Тахтаджян, 1954). Distribution in the Caucasus is given according to А. А. Гроссгейм (1939), with small changes as adopted in “Flora of Armenia”. Distribution in Turkey and Iran is given as adopted in “Flora of Turkey” (Bokhari & Edmondson, 1982) and “Flora of Iran” (Rechinger & Schiman-Czeika, 1974).

Leaf features in the key refer to the summer leaves and not include the broadened base. Spikelet size is measured from the base of the outer bract to the margin of the calyx limb. Size of spike (if not pointed out specially) includes the scape. The feature of the veins in the calyx limb reaching the margin or not, or exceeding it probably depends on the maturity of the flower and has not been used.

## Results

### *Acantholimon* Boiss. 1846, Diagn. Pl. Or. Nov. Ser. 1, 7: 69, nom. conserv.

#### Sect. 1. *Acantholimon*

1. *A. bracteatum* (Girard) Boiss. 1846, Diagn. Pl. Or. Nov. Ser. 1, 7: 70. — *Statice bracteata* Girard, 1844, Ann. Sci. Nat. ser. 3, 2: 330. — *Acantholimon bracteatum* var. *bracteatum* Bokhari 1972, Notes Roy. Bot. Gard. Edinb. 30: 76; Edmondson & Bokhari, 1982, Fl. Turk. 7: 482. — *A. splendidum* Bunge, 1872, Mém. Acad. Sci. Pétersb. ser. 7, 18: 17. — *A. bracteatum* var. *splendidum* (Bunge) Boiss. 1875, Fl. Or. 4: 827. — *A. bracteatum* var. *intermedium* Bordz. 1935, Журн. Инст. бот. АН УРСР, 3, 11: 75.

Typus: “In Aderbidjan prope Seid Khodjé”, Aucher-Eloy 5242, holo. P, iso. FI, G, K.

Is.: Линчевский, 1952: tab. 16, fig. 4; Mobayen, 1964: fig. 18; Rechinger & Sciman-Czeika, 1974: tab. 100, fig. 1, 2; Bokhari & Edmondson, 1982: fig. 15, B, J; Assadi, 2005: 72; Gabrielian & Fragman-Sapir, 2008: 301.

Maps: Тамамшян, 1967: map 195; Edmondson & Bokhari, 1982: map 60; Assadi, 2005: 209.

Habitats: Stony slopes, rocks, screes. 1500—2300 m s. m. Fl. VI—VII. Fr. VII—VIII.

Distribution in S. Transcaucasia: Armenia: Erev. (basins of Azat, Milly and Vedy rivers), Dar. (between Ekhegis and Vardahovit), Zang. (Sisian). ?Nakhichevan (Прилипко, 1957: 44).

General distribution: E. Anatolia, NW. Iran.

In Armenia only *A. bracteatum* s. str. can be found.

*A. capitatum* Sosn. 1915, Вестн. Тифл. Бот. Сада, 11: 11 (= *A. bracteatum* var. *capitatum* (Sosn.) Bokhari, 1970, Notes Roy. Bot. Gard. Edinb. 30: 300; = *A. scabiosum* Mobayen, 1964, Revis. taxon. gen. Acantholimon: 298, fig. 20; Typus: “Prov. Kars. Distr. Olty. Inter pp. Karnawaz et Lespek. 8.VII. 1911. D. Sosnovsky”, holo. TBI 1001793! iso. LE!), distributed in E. Anatolia, differs from *A. bracteatum* by a white calyx limb with the veins exceeding the margins. The question of relationships of these two species needs investigation in the *locus classicus*.

*A. bracteatum* var. *intermedium* Bordz. (Typus: “M. Eranos, pars supra, ad pagum. 14. VI. 1932. Sophia Tamamschian et Wlad. Maleew”, holo. ERE 19267!, iso. ERE 19268!) is ranked among the synonyms of *A. bracteatum* for the first time.

2. *A. gabrieljanae* Mirzoeva, 1981, Биолог. журн. Армении, 34, 9: 973. — *A. nairicum* Mirzoeva in sched. ad specim isotyp.

Typus: «Армянская ССР, Севанский р-н, южный берег оз. Севан (Гюней), между с. Джил и с. Бабаджан. Известняковый склон, 2000 м над ур. м., 17.VI.1954, А. Ахвердов, Н. Мирзоева», holo. ERE 116094! iso. ERE 116095—116098! 175936!

Paratypus: «АрмССР, Севанский р-н, между мысом Цамакаберд и Ахтамаром, на скалах, V.1979, П. Гамбарян, ERE 116099» at present is absent in ERE. Gatherings of P. Gambaryan from the same places (surroundings of Sevan town), determined by him as *A. gabrieljanae* in reality belong to *A. glumaceum* (see note to *A. glumaceum*).

Habitats: Limestone stony slopes. 2000 m s. m. Fl. VI. Fr. VII.

Distribution in S. Transcaucasia: Armenia: Sevan (between Jil and Tsapatagh [Babajan]). Endemic, known only from the *locus classicus*.

Apparently related to *A. wilhelminae* Rech. f. & Sciman-Czeika 1974, Fl. Iran. 108: 44, tab. 27.

Sect. 2. *Staticopsis* Boiss. 1846, Diagn. Pl. Or. Nov. Ser. 1, 7: 71.

3. *A. vedicum* Mirzoeva, 1955, Докл. АН АрмССР, 21, 4: 183; id. 1956, Фл. Арм. 2: 479; Тамамш. 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 185; Мирзоева, 1972, in Тахт. и Фед., Фл. Ерев.: 105. — *A. lepturoides* auct. non Bunge: Гроссг. 1932, Фл. Кавк. изд. 1, 3: 216, p. p.; Мирзоева, 1956, Фл. Арм. 2: 479; Тамамш. 1967, in Гроссг., Фл. Кавк. изд. 2, 7, p. min. p.; Мирзоева, 1972, in Тахт. и Фед., Фл. Ерев.: 105; ?Doğan & Akaydin, 2007, Bot. Journ. Linn. Soc. (London), 154: 411. — *A. araxanum* auct. non Bunge: Мирзоева, 1956, Фл. Арм. 2: 480; Тамамш. 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 186, map 196, p. min. p.; Мирзоева, 1972, in Тахт. и Фед., Фл. Ерев.: 105; ?Doğan & Akaydin, 2007, Bot. Journ. Linn. Soc. (London), 154: 414, p. p.

**Lectotypus (hic designatus):** «Ведийский р-н, Боз-Бурун. Фригана на известняковых, каменистых скл. 900—1000 м. 28 мая 1948 г. [А. Ахвердов, Н.Мирзоева]», ERE 58305! **iso.:** «Ведийский р-н, известняковый массив Боз-Бурун. Фригана на известняковых, каменистых, юж. скл. 28 мая 1948 г. А. Ахвердов», ERE 58304!

In protologue is cited: «Тип: Ведийский район. Известняковый массив Боз-Бурун. 28. V. 1947 г. А. Ахвердов и Н. Мирзоева» (ERE). However, in Herbarium ERE only the above mentioned specimens are kept, both determined by Mirzoeva: "*Acantholimon vedicum* Mirzoeva sp. nova". The first of these V. Avetisyan (1997, in sched., Аветисян, 2002: 38), designated as the holotype as it "corresponds to the drawing of protologue" and the second as an isotype. Although there probably is just a mistake in the year citation in the protologue, the lectotype must be designated.

Map: Тамашян, 1967: map 195; map 196, p. min. p. (Armenia), pro *A. araxanum*.

Is.: Мирзоева, 1955: fig. 1; Мирзоева, 1956: tab. CLI (the drawing is done from the lectotype, but is poor); Gabrielian & Fragman-Sapir, 2008: 303.

Habitats: Stony slopes, screes, often limestone, phryganoid vegetation. 600—1500 (1700) m s. m. Fl. (V) VI. Fr. VII.

Distribution in S. Transcaucasia: Armenia: Erev. (E of Hrazdan river), Dar. (Mozrov, Sevakavan, Amaghu, Danzak, Arpa). ?Nakhichevan (N)

General distribution: NE. Anatolia (Kagyzman and Artvin regions)

Мирзоева (1955: 188) cited *A. lepturoides* for the first time for Armenia (in the same work where *A. vedicum* is described!), noting that it differs from typical *A. lepturoides* by the strongly pubescent scapes and rachis and the length of the outer bract. For the specimens cited as *A. araxanum* from Armenia Мирзоева (1972: 105) noted: "scapes glabrous, rachis pubescent from the side of spikelets". In fact Мирзоева, having described a good species *A. vedicum*, left this name only for the types, and all the rest of the material of this species, even from the *locus classicus*, determined as *A. lepturoides* and very rarely as *A. araxanum* (Gorovan). *A. vedicum* is really allied to *A. araxanum*, differing only by pubescence of the scapes and rachis, and is very well distinguished from the central and eastern Transcaucasian distributed *A. lepturoides* by triquetrous-aciform, 2.5—5 cm long (not flattened triquetrous, narrowly triangular, 1.5—3 cm long) leaves, shortly pilose (not glabrous) scapes and rachis, and narrowly triangular-lanceolate, sometimes pilose on vein (not narrowly triangular, cuspidate, always glabrous) outer bract.

At least some of the material, determined as *A. lepturoides* from NE. Anatolia (Тамашян, 1967: map 196 (Kars region), has to be placed in *A. vedicum*. Possibly also some of the material cited as *A. araxanum* by Doğan & Akaydin (2007: 414) between Horasan and Kağızman, Kars and Kağızman, must be referred to *A. vedicum*.

Plants growing in the northern part of Nakhichevan are transitional to *A. araxanum*, with poorly pubescent scapes and rachis. Typical forms of *A. araxanum* are present in the same localities. These populations need investigation in nature.

**4. *A. araxanum*** Bunge, 1872, Мém. Acad. Sci. Pétersb. Ser. 7, 18, 2: 33. — *A. trautvetteri* Kusn. 1902, Mat. Фл. Кавк. 4, 1: 183.

Syntype: "In apricis siccis ad Araxem et in districtu Choi provinciae atropatanae Persiae boreali-occidentalis" Szovits, P, G; "Aderbidzhan. Szovits 492 adn.", LE!; "Persia borealis, leg. Szovits", W!

Maps: Тамашян, 1967: map 196, p. max. p. (excluding Armenia); Assadi, 2005: 217.

Is.: Mobyen, 1964: fig. 59; Assadi, 2005: 150.

Habitats: Stony slopes, screes, often limestone. 900—1500 m s. m. Fl. V—VI. Fr. VII.

Distribution in S. Transcaucasia: Nakhichevan.

General distribution: NE. Anatolia, NW. Iran.

Close to *A. vedicum*, differing only by the glabrous scape and rachis. There are some transitional forms to *A. vedicum* in the North of Nakhichevan and surroundings of Kagizman in NE. Anatolia. These populations need special investigation in nature.

**5. *A. hohenackeri*** (Jaub. & Spach) Boiss. 1846, Diagn. Pl. Or. Nov. Ser. 1, 7: 75. — *Statice hohenackeri* Jaub. & Spach, 1842—1843, Ill. Pl. Or. 1: tab. 92.

Typus: "Crescit in provincia Talysh in collibus apricis in tractu Suwant alt. 4000 ped., Julio florens, Hohenacker", P.

Is: Jauber & Spach, 1842—1843: Tab. 92.; Мирзоева, 1956: tab. CLIV (drawing is done from the properly determined specimen, but is poor); Прилипко, 1957: tab. 4; Rechinger & Schiman-Czeika, 1974: tab. 103, fig. 1; Assadi, 2005: 138 (poor).

Maps: Тамашян, 1967: карта 197; Assadi: 215.

Habitats: Limestone stony slopes, screes, phryganoid vegetation. 700—1500 m s. m. Fl. V—VI. Fr. VI—VII.

Distribution in S. Transcaucasia: Armenia: Erev. (Erakh ridge), ?Dar. (Arpa), Meghri (Kartshevan); Nakhichevan (Ordubad).

General distribution: Caucasus (Karabakh (Murovdagh ridge, Ganza, Isti-su), Talysh), SE. Anatolia, NW. and N. Iran.

Very variable species. Typical *A. hohenackeri* is distributed only in Talysh and N. Iran.

In Armenia *A. hohenackeri* grows in the same localities as *A. vedicum* and some specimens are intermediate and difficult to determine in the herbarium. In nature *A. vedicum* and *A. hohenackeri* are easily distinguished. It seems that *A. hohenackeri* flowers a little earlier than *A. vedicum*.

**6. *A. glumaceum*** (Jaub. & Spach) Boiss. 1846, Diagn. Pl. Or. Nov. Ser. 1, 7: 75. — *Statice glumacea* Jaub. & Spach 1842—1843, Ill. Pl. Or.: 162, tab. 91. — *Acantholimon glumaceum* var. *breviscapum* Trautv. 1873, Acta Horti Petropol. 2: 582. — *A. glumaceum* var. *typica* Trautv. 1876, Acta Horti Petropol. 4: 180. — *A. echinus* auct. non (L.) Boiss: Мирзоева, 1955, Докл. АН АрмССР, 21, 4: 187; id. 1956, Фл. Арм. 2: 485; Тамаш. 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 187. — *A. calvertii* auct. non Boiss.: Мирзоева, 1955, Докл. АН АрмССР, 21, 4: 187; id. 1956, Фл. Арм. 2: 474; Тамаш. 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 185. — *A. puberulum* auct. non Boiss. & Balansa: Мирзоева, 1955, Докл. АН АрмССР, 21, 4: 187; id. 1956, Фл. Арм. 2: 485; Тамаш. 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 187. — *A. avenaceum* auct. non Bunge: Мирзоева, 1955, Докл. АН АрмССР, 21, 4: 187; id. 1956, Фл. Арм. 2: 474; Тамаш. 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 185; Мирзоева, 1972, in Тахт. и Фед., Фл. Ерев.: 103. — *A. gabrieljanae* auct. non Mirzoeva: Гамбарян, in sched.; Gabrielian & Fragman-Sapir, 2008: 24.

Typus: «In Armenia legit Tournefort», holo. P-Tourn. 3130.

Is: Jauber & Spach, 1842—1843: tab. 91; Mobyen, 1964: fig. 51; Линчевский, 1952: tab. 18, fig. 1; Тамашян, 1967: tab. 16; Bokhari & Edmondson, 1982: fig. 15 (E); Gabrielian & Fragman-Sapir, 2008: 301.

Maps: Тамашян, 1967: map 189; Bokhari & Edmondson 1982: map 64 (p. p., excluding Inner Anatolia).

Distribution in S. Transcaucasia: Armenia: U. Akhur., Shir., Lori (Kefli, Mets Parni), Apar. (Mounts Tekhenis, Araler), Sevan, Erev. (?Erakh and Urts ridges), Dar. Nakhichevan (Shahbuz, Bichenakh, Aznaberd, between Kjanza and Sojikh Mount.)

General distribution: Caucasus [C. Cauc. (Balkarya: gorge of Cherek Balkarsky, village Zylgy), SW. Transcauc., ?Karabakh (Тамашян, 1967: map 189)], E. Anatolia.

Habitats: Stony slopes, subalpine open oak forests, Juniper open forests, tragacanth formations. (1000) 1500—2500 (2700) m s. m. Fl. VIII—IX. Fr. IX—X.

Very variable species.

One of the important diagnostic features of *A. calvertii* Boiss. (distributed in E. Anatolia) is the persistent circinnate leaf base on the branch. This is absent in a population with a pink calyx from Araler Mountain in Armenia, determined by Mirzoeva as *A. calvertii*. Another feature, colour of the calyx (pink for *A. calvertii*), varies in this population from white to purplish. Specimens with a pink calyx also occur in the surroundings of Sevan town.

The diagnostic feature of *A. puberulum* Boiss. & Balansa (distributed in S. and Inner Anatolia) is a combination of very short scapes and strong pubescence of the whole plant. Plants from Arteny Mountain in Armenia, determined by Mirzoeva as *A. puberulum*, on the contrary have long scapes and strongly branched inflorescences. Pubescent specimens with short scapes are found in Darelegis between the villages Khachik and Gnishik, but grow together with all transitional forms to typical *A. glumaceum*.

It is important to note that some specimens of *A. glumaceum* have 2-flowered or 1-flowered spikelets with 5 bracts. Such specimens from the surroundings of Sevan town were determined by P. Gambaryan as *A. gabrieljanae*. Maybe this group of species is transitional to section *Acantholimon* (see note to *A. sahendicum*)?

7. ***A. sahendicum*** Boiss. & Buhse 1860, Nouv. Mém. Soc. Nat. Moscou, 12: 183. — *A. glumaceum* var. *sahendicum* (Boiss. & Buhse) Kusn. 1902, Mat. Фл. Кавк. 4, 1: 193, in observ.

Typus: "Sahendgebirge, 8—9000 F. ü d. M., 20 Juni 1847. Buhse N 574", G.

Is: Assadi, 2005: 143.

Maps: Assadi, 2005: 216.

Habitats: Stony slopes, rocks, subalpine oak open forest. (1000) 1500—2700 m s. m. Fl. (VI) VII—VIII (IX). Fr. VIII—IX.

Distribution in S. Transcaucasia: Armenia: Zang. (between Kafan and Chakaten, Mounts Kaputjikh, Yaglu), Meghri (Zangezur ridge, Mount Chknavor). Nakhichevan (Bichenakh, S of Zangezur ridge)

General distribution: Caucasus (Karabakh: Ganza), NW. Iran.

Same to *A. glumaceum*, very rare occur 1-flowered spikelets with 5 bracts.

Contrary to Линчевский (1952: 350), in Herbarium LE (2009) there were no type specimens.

8. ***A. festucaceum*** (Jaub. & Spach) Boiss. 1846, Diagn. Pl. Or. Nov. Ser. 1, 7: 76. — *Stalice festucaceum* Jaub. & Spach 1843, Ann. Sci. Nat. Ser. 2, 19: 254.

Syntype: "Persia" Aucher N 2169 et 5239A", G; "Aucher-Eloy — Herbar d'Orient. N 5239. Persia A", W!

Map: Assadi, 2005: 214.

Habitats: Stony slopes, screes. 500—1400 m s. m. Fl. VI—VII. Fr. VII—VIII.

Distribution in S. Transcaucasia: Armenia: Meghri (Tsiranadzor gorge on the boundary with Nakhichevan, Kuris, Nrnadzor). ?Nakhichevan.

General distribution: NW., N. and C. Iran.

The species was reported for the first time as new for the Caucasus (Оганесян, 2007) from surroundings of Nrnadzor [Njvadi] village. Later specimens from other localities were found among undetermined material (ERE, LE).

9. ***A. tenuiflorum*** Boiss. 1846, Diagn. Pl. Or. Nov. Ser. 1, 7: 78. — *Stalice acerosa* auct. non Willd., nec M. Bieb.: Hohen. 1833, Bull. Soc. Nat. Moscou, 6: 227.

Typus: "In deserto ditionis Elisabethopol Georgiae Caucasiae. T. Fr. Hohenacker unio itiner. 1834" (pro *Stalice acerosa*), holo. G, iso. W (4 sheets)!, LE!

Map: Тамашян, 1967: map 195.

Habitats: Limestone stony slopes. 1350 m s. m. Fl. VII. Fr. VIII.

Distribution in S. Transcaucasia: Armenia: Zang. (Shamb).

General distribution: Caucasus (E. Transcaucasia).

Reported for the first time for the flora of Armenia: «Армения, Сисианский р-н, 2 км к востоку от с. Шамб, степь, каменистые склоны, 1350 м. н. у. м., 21.07.2009, leg. И. Аревшатян, det. М. Оганесян XI. 2009», ERE 175304.

Previously was considered to be an endemic of East Transcaucasia. The above mentioned specimen differs from those from East Transcaucasia by light glaucescent-green (not glaucous-grey) leaves, growth at higher altitudes and correspondingly later flowering. In East Transcaucasia it grows in foothills and low mountains, and flowers in May—June.

10. ***A. caryophyllaceum*** Boiss. 1846, Diagn. Pl. Or. Nov. Ser. 1, 7: 78. — *A. caryophyllaceum* subsp. *caryophyllaceum* Bokhari, 1972, Notes Roy. Bot. Gard. Edinb., 30: 299; Bokhari & Edmondson, 1982, Fl. Turk. 7: 488. — *A. acerosum* auct. non (Willd.) Boiss.: Мирзоева, 1955, Докл. АН АрмССР, 21, 4: 187; id. 1956, Фл. Арм. 2: 480, p. max. p.; Тамашян, 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 186.

Typus: "In rupestribus m. Gara Kurdist. D. 3 Aug. 1841. Th. Kotschy. Pl. Alepp. Kurd. moss. 368. Ed. Hohenacker 1843", holo. G, iso. K, W!

Is.: Мирзоева, 1956: tab. CLIII.

Maps: Тамашян, 1967: map 196 (pro *A. acerosum*); Bokhari & Edmondson, 1982: map 62; Assadi, 2005: 217.

Habitats: Stony slopes, rocks. (1200) 1500—2400 (2600) m s. m. Fl. VII (VIII). Fr. VIII (IX).

Distribution in S. Transcaucasia: Armenia: Dar. Nakhichevan (Zangezur ridge).

General distribution: E. Anatolia, NW. Iran, N. Iraq.

11. ***A. takhtajanii*** Ogan. sp. nova. — *A. armenum* auct. non Boiss. & Huet: Bunge, 1872, Mém. Acad. Sci. Pétersb. Ser. 7, 18, 2: 36, p. min. p. (pro plantae e Azkur); Линч. 1952, Фл. СССР 18: 347; Мирзоева, 1956, Фл. Арм. 2: 480; Прилипко, 1957, Фл. Азерб. 7: 47; Тамашян, 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 187; Мирзоева, 1972, in Тахт. и Фед., Фл. Ерев.: 105; Оганесян, in sched. — *A. balansae* auct. non (Boiss. & Huet) Bunge: Гроссг. 1932, Фл. Кавк. изд. 1, 3: 217; id. 1939, Определ. Раст. Кавк.: 593; Манден. 1952, Фл. Груз. 7: 71. — *A. armenum* var. *balansae* auct. non Boiss. & Huet: Кузн. 1902, Mat. Фл. Кавк. 4, 1: 187. — *A. armenum* var. *armenum* auct.: Doğan & Akaydin, 2007, Bot. Journ. Linn. Soc. (London), 154: 411, p. min. p. (pro plantae e Kars). — *A. acerosum* auct. non (Willd.) Boiss.: Мирзоева, 1956, Фл. Арм. 2: 480, p. min. p.

**Holotypus:** "Armenia, Armavir province, road Karakert — Shenik, 2 km WSW Karakert, semi desert, 1120 m s. m., 40°13'51"N, 43°47'38"E, 17. 06. 2010, leg. G. Fayvush, M. Oganessian, L. Pignotti, H. Ter-Voskanyan, E. Venturi, V. Fayvush & E. Vitek, E. Vitek N 10—1457", ERE 177019; iso. ERE 177020—177022, W, LE, TBI, B, G. (fig. 1, 2, p. 43)

Fruticulus dense hemisphaerico-pulvinatus, glaucus, calcareo-punctatus. Rami dense foliosi. Folia monomorpha, pallide glauca, glabra, margine scabrida. Folia novella basi dilatata, plana, superne plano-triquetra, triangulari-lineararia, (1) 1,5—2 (2,5) × (10) 15—30 (40) mm, margine vallato-incrassata, mucronata; mucro ochraceo-coloratus, 1 mm longus. Folia vetusta reflexa. Scapus ad 12 cm longus, folia plerumque superans, folia caulina (2) 3—4 (5) ferens. Spica non ramosa, 8—20-spiculata, cum scapo 10—15 (20) cm longa. Rachis et scapus plerumque



Fig. 1. Holotype of *Acantholimon takhtajanii*

breviter pilosa; si scapus rariter subglaber, rachis saltem in spiculis pilosa. Rachis subrecta; articuli rachidis basi tubo calycis aequilongi, apice 1/3 tubo calycis aequilongi. Spiculae uniflorae, 13—17 mm longae. Bracteae glabrae. Bractea exterior ovoideo-triangularis vel anguste triangularis, cuspidata, bracteis interioribus aequilonga vel (1/2) 2/3 (3/4) longitudinis eorum attingens, margine anguste hyalina, centrum versus ochracea, basin glauca. Bracteae interiores subaequales, tubo calycis subaequales vel paulo longiores, (ovato- vel oblongo-) spatulatae, apice mucronatae (mucro 1 (2) mm longus), hyalinae praeter nervos atropurpureos vel virides. Calyx 13—16 mm longus, infundibularis; tubus limbo 1—1,5 aequilongus, tubus pilosus; limbus candidus, 10-lobatus, nervis pilosis, atropurpureis, limbi marginem attingentibus vel subexcurrentibus, in fructibus mucronulatis. Petala rosea, limbo calyce 3-plo longiora.

A proximo *A. armenum* (var. *balansae* incluso) bracteis exterioribus interioribus manifeste brevioribus (non longioribus, aequalibus vel rarissime paulo brevioribus), rachide subrecta (non flexuosa) et foliis (1) 1,5—2 (2,5) mm lata (non 2—3 mm in var. *armenum*, nec ad 1,5 mm in var. *balansae*) differt.

Glaucous, calcareous-punctate, densely pulvinate hemispherical shrublet. Branches densely foliated. Leaves monomorphic, light glaucous-green, glabrous, scabrid on margins. Young leaves at base flat, broad, in upper part flattened-triangular, narrowly triangular-linear, (1) 1,5—2 (2,5) × (10) 15—30 (40) mm, with light vallate-incrassate margins, at apex mucronate; mucro ochra-coloured, 1 mm long. Old leaves dark brown, reflexed. Scape up to 12 cm long, usually exceeding the leaves, bearing (2)3—4(5) leaves. Spike unbranched, bearing 8—20 spikelets. Spike together with scape 8—15 (20) cm long. Scape and rachis usually shortly pilose, if rarely almost glabrous, then rachis pilose at least from the side of the spikelets. Rachis almost

straight. Rachis articules at base ± equal to calyx tube, in upper part to 1/3 of tube. Spikelets 1-flowered, 13—17 mm long. Bracts glabrous. Outer bract ovoid-triangular to narrowly triangular, cuspidate, equal to (1/2) 2/3 (3/4) of inner ones, with narrow white hyaline margins, in middle part ochra-coloured, at base green. Inner bracts subequal, equal to tube or slightly longer, (ovate- or oblong-) spatulate, mucronate (mucro 1 (2) mm long), hyaline except the rigid green or dark purple vein. Calyx 13—16 mm long, infundibular; tube equal to 1—1,5 of limb, pilose on the veins and between them; limb pilose only on veins, white, indistinctly 10-lobed; veins dark purple, up to the end or slightly exceeding the limb, in fruits with short mucro. Petals pink, 3 times the lengths of the calyx limb.

Differs from the certainly related *A. armenum* Boiss. & Huet (including var. *balansae* Boiss. & Huet) by the outer bracts distinctly shorter (not longer, equal or rarely slightly shorter) than inner ones and the almost straight (not flexuous) rachis. The leaves are intermediate between var. *armenum* and var. *balansae*. Differs from var. *armenum* by narrower leaves (1) 1,5—2 (2,5) mm broad (not 2—3 mm broad); from var. *balansae* by broader leaves (not up to 1,5 mm broad).

Eponymy: The species is named in honour of great botanist Armen Takhtajan.

Is. (pro *A. armenum*): Мирзоева, 1956: tab. CLII; Мирзоева, 1972: fig. 21; Gabrielian & Fragman-Sapir, 2008: 299.

Map: Тамашян, 1967: map 197 (pro *A. armenum*).

Habitats: Stony slopes, phryganoid vegetation, mountain steppe, light open forests. (800) 1200—1800 (2200) m s. m. Fl. (VI) VII (VIII). Fr. VIII.

Distribution in S. Transcaucasia: Armenia: Shir., Lori (Nalband), Sevan (Areguni coast), Erev., Apar. (Aghveran gorge), Dar. ?Nakhichevan (Прилипка, 1957: 47; Тамашян, 1967: 186, map 197, pro *A. armenum*).

General distribution: Caucasus (SW. (Meskhety) and C. (Trialety: Tana and Ateny rivers, Borzhomy gorge) Transcauc.), NE. Anatolia (E of 42° E: Kars (?and Ardaghan) plateau and valley of Arax river).

*A. armenum* (Typus: "in Armenia prope Erzurum [VII 1853], Huet du Pavillon" (holo. G, iso.: "Circa Erzeroum. Armenia. Jul. 1853. Huet du Pavillon. Planta orientalis exsiccata. *Acantholimon armenum* Boiss. & Huet", K, W)) is distributed in Turkey in S. and E. Anatolia by the Anatolian diagonal, in W. Syria and ?N. Iraq. While *A. armenum* var. *armenum* comes more or less up to *A. takhtajanii* on the eastern border of its area, var. *balansae* (Typus: [Turkey B5 Kayseri] "in jugo Aslan dach (Aslantas) Antitauri 12 leucis (48 km) ad orientem Caesareae in Cappadocia, 1856, Balansa", holo. G), has a distinct disjunction in area with *A. takhtajanii*.

Though the diagnostic features of *A. takhtajanii* are mainly quantitative, they are very consistent throughout the whole area (except the marginal populations in Meskhety and Areguni coast). Some specimens in Meskhety (800—1000 m s. m.) differ from the typical ones: scapes glabrous, rachis just slightly pubescent from the side of spikelet, outer bract narrowly triangular and rarely similar in shape to that of *A. armenum*, slightly shorter or equal to inner ones, branches with more numerous reflexed dead leaves. Some plants on the Areguni coast of Sevan lake (1950—2200 m s. m.) have thicker, shorter (up to 2—2.5 cm) scapes, glabrous scapes and rachis, spikelets almost imbricate in upper part, outer bracts almost equal to inner ones and with a longer cusp (up to 2.5 mm), larger leaves (30—55 × 1.5—2.5 mm) and branches with more numerous reflexed dead leaves. Such variability is normal for marginal populations.

12. **A. fedorovii** Tamamsch. & Mirzoeva, 1955, Докл. АН АрмССР, 21, 4: 184.

Typus: "Flora Armeniae. Inter Ordubad et p. Megry. In fauc. fl. Arax. 25.VI.1929. Schelkownikow et Kara-Murza. det. S. Tamamschian 1941", holo. ERE 27394! iso.: "Flora Armeniae. Inter Ordubad et p. Megry. In fauc. fl. Arax. 25.VI.1929. A. Шелковников, Е. Кара-Мурза. det. N. Mirzoeva 14.III.1955", ERE 28730! 28731! Paratypi: ERE!

Is: Мирзоева, 1956: tab. CLVII; Gabrielian & Fragman-Sapir, 2008: 301; Gabrielian, 2010, in Red Book of Plants of the Republic of Armenia: 385.

Map: Oganessian, 2010, in Red Book of Plants of the Republic of Armenia: 385.

Habitats: Rocks, stony slopes, screes. 600—800 m s. m. Fl. V—VIII. Fr. VII—VIII.

Distribution in S. Transcaucasia: Armenia: Meghri (Agarak, Kartchevan, Tsiranadzor gorge). Nakhichevan (Ordubad, Kilit, Ketam). Narrow endemic of South Transcaucasia, distributed from Ordubad to Agarak.

In original description was wrongly placed into section *Tragacanthina*. Placed in section *Staticopsis* with doubt. Taxonomic position still needs definition.

Sect. 3. **Tragacanthina** Bunge, 1872, Мém. Acad. Sci. Pétersb. Ser. 7, 18, 2: 54.

13. **A. tragacanthinum** (Jaub. & Spach) Boiss. 1846, Diagn. Pl. Or. Nov. Ser. 1, 7: 81; Линч. 1952, Фл. СССР 18: 369—370, in observ.; Прилипко, 1957, Фл. Азерб. 7: 53, in observ. — *Statice tragacanthina* Jaub. & Spach 1843, Ann. Sci. Nat. Ser. 2, 20: 256. — *Acantholimon scorpius* auct. non (Jaub. & Spach) Boiss.: Гроссг. 1939, Определ. Раст. Кавк.: 592. — *A. fedorovii* auct. non Tamamsch. & Mirzoeva: Тамамш. 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 190, p. p. excl. typ.

Typus: [W Iran] "In Media ad lacum Matianum, Aucher 5239" (p. p.), G.

Map: Assadi, 2005: 220.

Is: Mobayen, 1964: fig. 68; Assadi, 2005: 180.

Habitats: Dry gypsum cobble slopes, 600—1100 m s. m. Fl. (V) VI. Fr. VII.

Distribution in S. Transcaucasia: Nakhichevan (surroundings of Ordubad)

General distribution: NE. Anatolia (Doğan & Akaydin, 2007: 402, between Kağızman and Tuzluca), NW. Iran.

14. **A. karelinii** (Stschegl.) Bunge, 1872, Мém. Acad. Sci. Pétersb. Ser. 7, 18, 2: 58. — *Statice karelinii* Stschegl. 1851, Bull. Soc. Nat. Moscou, 24, 4: 475. — *Acantholimon szovitsii* Boiss. & Buhse, 1860, Nouv. Мém. Soc. Nat. Moscou, 12: 184 — *A. quinquelobum* auct. non Bunge: Кузн. 1902, Мат. Фл. Кавк. 4, 1: 197; Гроссг. 1932, Фл. Кавк. изд. 1, 3: 216; id. 1939, Определ. Раст. Кавк.: 592; Линч. 1952, Фл. СССР 18: 367; Мирзоева, 1956, Фл. Арм. 2: 486; Прилипко, 1957, Фл. Азерб. 7: 53; Мирзоева, 1972, in Тахт. и Фед., Фл. Ерев.: 103; Тамамш. 1967, in Гроссг., Фл. Кавк. изд. 2, 7: 188; Bokhari, 1972, Notes Roy. Bot. Gard. Edinb. 30: 69; Bokhari & Edmondson, 1982, Fl. Turk. 7: 485; Doğan & Akaydin, 2007, Bot. Journ. Linn. Soc. (London), 154: 402. — *A. curviflorum* auct. non Bunge: Bokhari, 1972, Notes Roy. Bot. Gard. Edinb. 30: 69; Bokhari & Edmondson, 1982, Fl. Turk. 7: 484. — *A. quinquelobum* var. *curviflorum* sensu Doğan & Akaydin, l. c.: 402.

Syntypi: "Nachitschevan, Kovalensky" [1850] G, P.

Maps: Тамамшян, 1967.: map 198 (pro *A. karelinii*), 199 (pro *A. quinquelobum*); Assadi, 2007: 219.

Is: Stschegleev, 1851: tab. 13, f. 4; Mobayen, 1964: fig. 65, 1A, B; Bokhari & Edmondson, 1982.: Fig. 15, Aa, Ab, Fig. 16, C (pro *A. curviflorum*); Assadi, 2007: 170; Gabrielian & Fragman-Sapir, 2008: 301.

Habitats: Stony slopes, screes, often limestone or gypsum, phryganoid vegetation. (600) 800—1400 m s. m. Fl. (V) VI. Fr. VII.

Distribution in S. Transcaucasia: Armenia: Erev. (E), Dar., ?Meghri (Agarak). Nakhichevan.

General distribution: NE. Anatolia, NW. and N. Iran.

Stschegleev (1851) in the original description didn't cite a type and any other specimens. He only mentioned the itinerary of collector Kovalensky. As types (syntypes) the above-mentioned specimens are cited by Rechinger & Schiman-Czeika (1974: 134): "LE, G! P!" In Herbarium LE in 2009 such specimen was absent.

The only specimen determined as *A. karelinii* from Meghri region (Мегринский р-н, Агарак, близ Правдаг, фриганоиды, 5.05.1979, leg. & det. А. Сагателян, ERE 124029!), is without spikes and more probably belongs to *A. manakyanii*.

The differences between *A. karelinii*, *A. curviflorum* and *A. quinquelobum* are well described by A. Bunge (1872: 55). All the later determinations of *A. quinquelobum* and *A. curviflorum* from South Transcaucasia refer to *A. karelinii*, which is extremely variable in the calyx features. Calyx with  $\pm$  infundibular 10-dentate limb (as on the drawing in the original description) can be found (scattered) in Nakhichevan and NW. Iran (Khoy), but is variable in these areas too. In all other parts of area the calyx is slightly infundibular or tubular. Variability of calyx is as follows: tube curved or straight, limb  $\pm$  infundibular or not, 5- or 10- dentate or lobate, or almost truncate; veins glabrous or pubescent, situated in the middle of lobes or between them, reaching the margins or not. All this variability can be observed on collections from the same population or even sometimes on the same plant.

According to the maps in "Flora of Iran" (Assadi, 2007: 219) *A. karelinii* is distributed in NW. and N. Iran, *A. curviflorum* in C. Iran and *A. quinquelobum* in NE. Iran.

Material on the *A. curviflorum* and *A. quinquelobum* (including the type material) was investigated in W and LE:

*A. quinquelobum*. Isotypus: "In rupibus dolomiticis aridis prope Schahrud provinciae Chorassan occidentalis. Bunge et Bienert" (few spikelets), W 1965-3117! *A. curviflorum*. Syntypi: "Prope Schur-ab inter Isfahan & Kum. Bunge & Bienert", W 1965-3113!; "M. rupestribus Persiae mediae occidentalis prope Kohrud. Bunge et Bienert" (few spikelets), W 1965-3114!; "Inter Teheran & Isfahan. Pr. Kohrud. May 1859. A. curviflorum m. [Bunge]" (2 sheets), LE!

The comparison between features of the spikelets of these 3 species, *A. manakyanii* and *A. tragacanthinum* is given in Tab. 1.

15. **A. manakyanii** Ogan. sp. n. — *A. karelinii* auct. cauc. in sched., p. min. p.

**Holotypus:** «Армения, Мегринский р-н, правый борт ущелья Агарак, выше села Карчеван, окрестности Геологоразведочной партии, сухие склоны, 900—1000 м над ур. м. 7.06.1985. В. А. Манакян, Н. С. Ханджян», ERE 177008; iso. ERE 177009, LE, W. (fig. 3)

Fruticulus laxo pulvinatus, glaucus, calcareo-punctatus. Rami laxo foliosi. Folia dimorpha, folia aestivalia basi dilatata, plana, scabriuscula, rubro-brunnea, late hyalino-marginata, supra glauca, glabra, subulata, (20) 30—50 (60)  $\times$  5—10 mm, apice mucronata; mucro 1 mm longus, fuscus. Scapus folia excedens, folia caulina 2—3 ferens. Spica triplo composita, multispiculata, paniculiforma, scapo incluso 15—20 cm longa. Axis  $\pm$  geniculatus, internodiis basi 2—3 cm longis; rami axibus breviores, flexuosi vel recti, apice circinnati; articuli rachidis basi spiculae vel tubo calycino aequilongi, ad apicem abbreviati. Spiculae ad basem ramorum remotae, ad apicem imbricatae, uniflorae, 9—10 mm longae. Brac-

teae glabrae, glaucae. Bractea exterior ovoidea, acuminata, marginibus late hyalina, medio glauca, 3—4 × 3—4 mm, 1/2—2/3 partem bracteae intimae longitudinis attingens; bractea secunda oblonga, apice sensim acutata, praeter nervum hyalina, 5 mm longa; bractea intima (1/2) 2/3 partem calycis longitudinis attingens, 6 mm longa, 3 mm lata, spatulata, apice mucronulata, margine et apice hyalina, medio lanceolata glauca. Calyx 8—9 mm longus, glabrus, leviter infundibularis; tubus 6,5—7,5 mm longus, erectus vel curvatus; limbus albus, indistincte (5)10-lobatus, 1,5—2 mm longus, nervis loborum principalium medio percurrans,

glabris, vinicoloris, in floribus margine evanescentibus, in fructibus margine attingentibus vel paulo excurrentibus. Petala rosea, calyce duplo longiora.

A speciebus sectionis *Tragacantina* forma inflorescentiae (inflorescentia *Limonium* simulans) et characteribus spicularum (Tab. 1) differt.

Glaucous, calcareous-punctate, laxly pulvinate shrublet. Branches laxly foliated. Leaves dimorphic. Summer leaves flat at base, broadened, slightly scabrid, reddish-brown, at margins broadly hyaline, in upper part glaucous-green, glabrous, subulate, with brownish mucro 1 mm long. Scape

**Table 1. Differences in spikelet features between 5 species of Section *Tragacanthina***

Species, distribution	<i>A. manakyanii</i> S. Transcaucasia: S. part of Zangezur ridge	<i>A. karelinii</i> S. Transcaucasia, NE. Anatolia, NW. and N. Iran	<i>A. curviflorum</i> C. Iran	<i>A. quinquelobum</i> NE. Iran	<i>A. tragacanthinum</i> S. Transcaucasia (Nakhichevan), ?NE. Anatolia, NW. Iran
Features of spikelets					
Calyx shape	Slightly infundibular, straight or curved	Tubular or slightly infundibular, straight or curved	Tubular, curved	Tubular, usually curved, rarely straight	Manifestly infundibular, straight
Calyx limb	Indistinct (5) 10-lobed	5—10 dentate or lobed, or almost truncate	Deeply 5-lobed	5-lobed (rarely indistinct (5)10-lobed)	10-dentate
Calyx veins	In the middle of lobes	In the middle of lobes or between them	In the middle of lobes	Between the lobes	In the middle of lobes
Length of the innermost bract	Up to (1/2) 2/3 of the whole calyx	Up to 1/3—1/2 of the whole calyx	All the bracts subequal, equal to (1/3) 1/2 of the whole calyx	Up to (1/2) 2/3 of whole calyx (in upper part 2 inner ones slightly broadened and slightly distant from calyx)	Up to 2/3—4/5 of calyx tube
Length of the outer bract	Up to 1/2—2/3 of the innermost one	Up to 1/3—4/5 of the innermost one	All the bracts subequal, equal to (1/3) 1/2 of the whole calyx	Up to 1/2 of the innermost one	Up to 1/2—4/5 of the innermost one

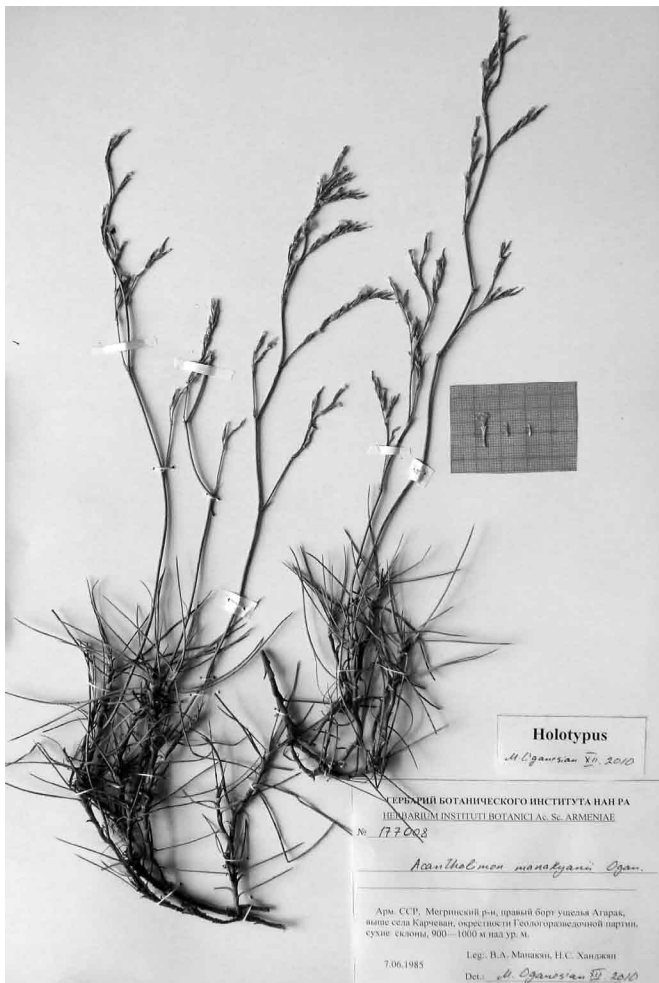


Fig. 3. Holotype of *Acantholimon manakyanii*

exceeding the leaves, bearing 2—3 leaves. Inflorescence a composite triplex paniculiform spike 15—20 cm long (with scape). Branches much shorter than central axis. Axis ± geniculate, with long (2—3 cm at the base) internodes. Branches slightly flexuous or almost straight, ± circinnate at the tops; rachis articules at base ± equal to calyx tube or spikelet, gradually shortening towards tops; spikelets at the base remote, at the tops almost imbricate; 1-flowered, 9—10 mm long. Bracts glabrous, glaucous. Outer bract ovoid, acuminate, in the middle glaucous-green, at the margins broadly hyaline, 3—4 × 3—4 mm, equal to 1/2—2/3 of the innermost bract, second bract oblong, at apex gradually acutate, hyaline except the vein, 5 mm long; inner bract equal to (1/2) 2/3 of whole calyx, slightly shorter than tube, 6 mm long, 3 mm broad, spatulate, at apex with short mucro, hyaline at margins and at top, glaucous-green in the middle lanceolate part. Calyx 8—9 mm long, glabrous, slightly infundibular; tube 6.5—7.5 mm long, straight or ± curved; limb white, 1.5—2 mm long, indistinctly (5) 10-lobed, with glabrous, vine-coloured veins in the middle of the main lobes, in flowers not reaching the margin, in fruits reaching or slightly exceeding the margin. Petals pink, twice as long as calyx.

Differs from the species of Sect. *Tragacantina* by the shape of paniculate inflorescence, resembling the inflorescence of *Limonium*, and by the features of the spikelets (Tab. 1)

Eponymy: The species is named in honour of collector, well-known bryologist Vrezh Manakyan.

Habitats: Dry stony slopes, screens, fryganoid vegetation. 600—1000 m s. m. Fl. V—VI, Fr. VI—VII.

Distribution: Armenia: Meghri (Karchevan, Agarak). Nakhichevan (Kilit, ?Ordubad). Narrow endemic of Southern edge of Zangezur ridge in S. Transcaucasia.

It seems that *A. karelinii* is distributed to East up to Ordubad, and then is replaced by *A. manakyanii* (see note to *A. karelinii*).

**Paratype: Armenia:** Distr. Migri, inter custodias Migri et Kartshevan. In valle fl. Araxis in lapidosis siccis cum "frigana". 600—700 m. 15.VI.1934. I. Karjagin. LE; Мегринский р-н. Ж. д. ст. Карчеван. Разъезд Мегри-чай. Левый борт Аракса. Фригана. 15.07.1947. А. Ахвердов. ERE 125283; Мегринский р-н, окр. Агарака, сухие каменные склоны, южная экспозиция, 12.06.1978, М. Оганесян, ERE 177010; Мегринский р-н, окр. Агарака, сухие каменные склоны, южная экспозиция, 12.06.1978, Э. Габриэлян, ERE 177011; Мегринский р-н, окр. Агарака, 12.05.1979, Г. Оганезова, ERE 177012; Мегринский р-н, окр. Агарака, 12.05.1979, Э. Габриэлян, ERE 177013, LE, W; Мегринский р-н, окр. Карчевана, красные конгломераты, 1000 м, 26.06.1986, Аревшатын, ERE 177014; Мегринский р-н, окрестности села Карчеван, сухие склоны у Геологоразведочной партии, 27.06.1986, Н.С. Ханджян, ERE 177015, 177016, LE. **Nakhichevan:** Distr. Nakhichevan, inter Migry et Ordubad, 1.VI.1923, A. Grossheim, ERE 19305; Ордубадский р-н, окр. сел. Килит, сухие россыпные склоны, 6.06.1982, Э. Габриэлян, ERE 177017, 177018, LE.

### Key to *Acantholimon* species in South Transcaucasia

1. Leaves dimorphic; summer leaves subulate, rounded in cross section, 0.5—1 mm in diam.; spring leaves shorter, broader, flatter and fleshy, early deciduous. Spikelets 1-flowered, 3-bracteate. Glabrous, glaucescent, calcareous-punctate plants . . . . . 2
- Leaves monomorphic; spring leaves just slightly shorter and broader than summer ones; both in cross section  $\pm$  (flattened) triangular, scabrid on the margins. Calyx infundibular . . . . . 4
2. Spike up to 10 cm, unbranched or with 1—2 branches. Spikelets imbricate, 10 mm long. Calyx 8 mm long, manifestly infundibular; limb 10-dentate, 2 mm long. Inner bracts subequal, up to 2/3—4/5 of calyx tube, linear- or oblong- spatulate, mucronate, outer bracts broadly ovoid, acuminate, up to 1/2—4/5 of inner ones. Leaves greyish-glaucous, 1—3 (4) cm long, except the upper ones horizontally or down reflexed . . . . . 13. **A. tragacanthinum**
- Spike longer, with many branches. Spikelets at least in the lower and middle parts not imbricate. Calyx slightly infundibular or tubular. Leaves glaucous-green, the young ones upright, old ones horizontally reflexed . . . . . 3
3. Spike double (rarely triple), (10) 15—30 cm long; branches very flexuous and fragile, comparable by length with the almost straight central axis; in branches rachis articules subequal,  $\pm$  equal to inner bracts; spikelets on the tops of branches not imbricate. Calyx 8—12 mm long, weakly infundibular or tubular, 5—10-dentate (lobed) or truncate; veins in the middle of main lobes or between them. Inner bracts subequal, equal to 1/3—1/2 of the length of calyx, oblong, acuminate; outer bract equal to (1/3) 1/2 (4/5) of inner ones, (narrowly or ovoid) triangular, acuminate. Leaves 2—5 cm long . . . . . 14. **A. karelinii**
- Spike triple, paniculate, 15—20 cm long; branches weakly flexuous or almost straight, less fragile, significantly shorter than geniculate central axis; in branches rachis articules unequal: in the lower part  $\pm$  equal to the calyx tube, in the upper parts very shortened; spikelets on the cincinnate tops of branches almost imbricate. Calyx 8—9 (10) mm long, slightly infundibular, indistinct (5) 10-lobed; veins in the middle of main lobes. Inner bracts subequal, equal to (1/2) 2/3 of the of calyx, oblong or spatulate, mucronate; outer bract equal to 1/2—2/3 of inner ones, ovoid, acuminate. Leaves (2) 3—5 (6) cm long . . . . . 15. **A. manakyanii**
4. Spikelets 2—many-flowered. Bracts 5 and more, glabrous. Leaves glaucous or glaucous-green, flattened triquetrous, narrowly triangular-linear. Spike unbranched . . . . . 5
- Spikelets 1-flowered. Bracts 3 (if sometimes bracts 5 and spikelets 1—2-flowered, leaves not glaucous, spike dense, spikelets imbricate — *A. glumaceum*, *A. sahen-dicum*) . . . . . 6
5. Calyx limb white, 5—6 mm long, subequal to tube. Outer bract 4—5 mm broad, 6—7 mm long, broadly ovoid, long acuminate, with short acumen and narrow (1—1.5 mm) hyaline margins; next 2 exceeding the tube, narrower, with broad hyaline margins, at apex rounded and mucronate; inner ones shorter but at apex much broader than middle ones, hyaline, mucronate. Scape 5—7 cm long. Spike dense, up to 4 cm long (without scape); spikelets imbricate. Leaves 1—2.5 cm long, 1.5 mm broad, with brownish-violet mucro, except the upper ones horizontally reflexed, very dense . . . . . 2. **A. gabrieljanae**
- Calyx limb pink or purple, 5 mm long, tube 7—8 mm long. Outer bract 10—12 mm in diam., broadly rounded-ovoid, mucronate, slightly exceeding the calyx tube, with broad (3—4 mm) hyaline margins; next 2 broadly spatulate, at apex emarginate and mucronate, almost completely hyaline; inner ones shorter, narrower, almost completely hyaline. Scape 6—18 cm long. Spike ovoid-capituliform, 2—2.5 cm in diam. Leaves 3—6 cm long, 1.5—2 mm broad, with brownish mucro, except the upper ones down reflexed . . . . . 1. **A. bracteatum**
6. Spike 1—3 cm, not exceeding or very slightly exceeding the leaves, corymbose branched. Spikelets 6—7 mm long, imbricate. Calyx 6—7 mm long; veins glabrous, green; limb 2—2.5 mm long, white, 5 (10)-dentate. Bracts glabrous, glossy; outer one 3 mm long, ovoid-lanceolate, with very short mucro, inner ones subequal, about 4 mm long,  $\pm$  ovoid. Petals white or pale pink. Leaves 1.5—2.5 cm long, narrowly triangular-linear, flattened triquetrous; young ones dull dark green, more old ones reddish-brown, the main dead part blackish, horizontally reflexed . . . . . 12. **A. fedorovii**
- Spike usually exceeding the leaves. Spikelets and calyx larger. Petals pink. Other characters not as above. . . . . 7
7. Calyx 12—16 mm long . . . . . 8
- Calyx 9—11 mm long . . . . . 11
8. Leaves triquetrous-aciform, (1) 2—3 (5) cm long, 1 mm broad, dull dark green, not glaucescent. Spikelets imbricate. Calyx tube 6—8 mm long, limb 5—6 mm long. Bracts usually 3, rarely 5 (and then the 4<sup>th</sup> and 5<sup>th</sup> ones membranous, linear, undeveloped). Outer bract ovoid-lanceolate, acuminate, up to 1/2—2/3 (1) of inner ones, green or brownish; inner ones subequal, subequal to tube, ovoid or spatulate, mucronate . . . . . 9
- Leaves not triquetrous-aciform. Spikelets not imbricate. Scapes and rachis usually shortly pilose; if scapes glabrous, rachis pilose at least from the side of spikelets. Spike normally unbranched. Complex of features different. . . . . 10
9. Whole plant glabrous, glossy, usually reddish-brown. Spike unbranched, 5—10 cm long. Inner bracts glossy, reddish. Calyx limb white . . . . . 7. **A. sahendicum**
- Plant  $\pm$  pubescent, not reddish-brown. Spike unbranched or with 2—5  $\pm$  approximate branches, 5—10 (15) cm long. Inner bracts not reddish, usually brownish. Calyx limb white or purplish-pink . . . . . 6. **A. glumaceum**
10. Cushions loose. Branches loosely foliated. Leaves not rigid, dingy yellowish-green,  $\pm$  shortly pilose, flattened triquetrous, linear, 1—2 mm broad, (3) 4—6 cm long. Spike 10—15 cm long; rachis slightly flexuous. Outer bract triangular-lanceolate, equal to 2/3 of inner ones, usually glabrous; inner ones subequal, slightly



- longer than calyx tube, ovoid-lanceolate, acutate, *pilose on veins* . . . . . 10. **A. caryophyllaceum**
- Cushions *dense, hemispherical*. Branches *densely foliated*. Leaves *rigid, glaucous light green, glabrous except the margins, strongly flattened triquetrous, narrowly triangular-linear, (1) 1,5–2 (2,5) mm broad, (1) 1,5–3 (4) cm long*. Spike 8–15 cm long; rachis *almost straight or slightly flexuose*. Bracts *glabrous*; outer one ovoid-triangular to narrowly triangular, acuminate, up to (1/2) 2/3 (3/4) of inner ones; inner ones subequal,  $\pm$  equal to calyx tube or slightly longer, (ovoid- or oblong-) spathulate, mucronate . . . . . 11. **A. takhtajanii**
11. Leaves *flattened triquetrous, narrowly triangular, light glaucous green, (1) 1,5–2 cm long, 1 mm broad*. Spike 15–30 cm long, *with 2–5 branches shorter and flowering later than almost straight central axis* (rarely unbranched); rachis articules in the basal and middle parts equal to spikelets; *scapes and rachis glabrous*. Outer bracts slightly shorter than inner ones, ovoid-lanceolate, acuminate, inner ones subequal with each other and calyx tube, lanceolate, acuminate. Calyx 9–10 mm long, *tube and limb subequal*, limb indistinctly 10-lobed . . . . . 9. **A. tenuiflorum**
- Leaves triquetrous-aciform, 1 mm broad. Complex of features different . . . . . 12
12. Spike 10–15 cm long, *with 3–7  $\pm$  flexuose, very fragile, cinnate at top branches*; scape and rachis *shortly pilose*. Calyx tube 6–7 mm long, limb 4 mm long, indistinctly 10-lobed. Inner bracts subequal or equal to each other and calyx tube; often incurvate, oblong or oblong-spathulate, at apex rounded, mucronulate; outer bract triangular-lanceolate, acuminate, up to 3/4 of inner ones. Leaves 1,5–2,5 (3) cm long, glaucous light green, old ones horizontally reflexed . . . . . 8. **A. festucaceum**
- Spike unbranched or with 1–2 branches . . . . . 13
13. Whole plant, especially the leaves, *glaucous-grey*. Leaves 1–2 cm long; old ones *horizontally reflexed*. Spike 10 (15) cm long, *slightly flexuose,  $\pm$  dense, spikelets at top almost imbricate; rachis shortly pilose*. Outer bract *ovoid-lanceolate, at base broad, almost amplexicaulous, with coriaceous, usually reddish or brownish middle part*, and narrow hyaline margins, usually 1/3–3/4 the length of inner ones (rarely equaling them or even longer); inner ones ovoid, subequal with each other and calyx tube, except the vein hyaline, near the rib usually *reddish-brown*. Calyx tube 4–5 mm long, limb 4–5 mm long . . . . . 5. **A. hohenackeri**
- Plant *glaucous-green*. Leaves *light glaucous-green, 2,5–5 cm long*; old ones usually *down reflexed*. Spike up to 20–25 cm long, *very flexuose and fragile, loose on the whole length; rachis articules from equal to the whole calyx to equal to its tube*. Outer bract *narrowly triangular-lanceolate, with narrow white hyaline margins, towards centre ochre-coloured, in basal part green; usually longer than inner ones*; inner bracts linear-lanceolate, *white* hyaline except the vein, subequal to each other and calyx tube . . . . . 14
14. *Scape and rachis glabrous*. Calyx tube 5 mm long, limb 4 mm long . . . . . 4. **A. araxanum** Bunge
- *Scape and rachis usually shortly pilose*; rarely scapes glabrous, but *rachis pilose at least from the side of spikelets*. Calyx tube 6 mm long, limb 5 mm long . . . . . 3. **A. vedicum**

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