

Plants of Heydar-Baba

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Abstract

In late summer 1994, on the verge of a floristic expedition to Siahroud region of Azarbaijan Province, I paid a visit to Professor Mousa Iranshahr. In this meeting, Professor Iranshahr advised me to include in my itinerary a study of plants grown in Heydarbaba Mountain, the scene of beautiful poems by the great contemporary poet Mohammad Hossein Shahriar. I followed his advice with much pleasure.

When I arrived at Heydarbaba for the first time, the guess of an early autumn wind had started to disturb the leaves of Tabrizi trees, which were dispersed abundantly in the landscape. And there was a slender stream flowing feebly alongside the tress, with withered leaves floating on it. The next spring, when I last visited Heydarbaba in the course of my study, this slender stream was by then a mighty torrent.

Keywords: Plants, taxonomy, ecology, HeydarBaba, Iran.

نگاهی بر پوشش گیاهی کوه حیدربابا

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چکیده

منظومه حیدربابایه سلام اثر جاویدان استاد محمد حسین شهريار از شهرت به سزایی برخوردار است. به نقل از شهريار، حیدربابا اسم کوهی است روبروی دهکده (قیش قورشاق) که در کنار رودخانه در فاصله میان قره‌چمن معروف و دهکده سنگل‌آباد واقع شده است. اواخر تابستان سال ۱۳۷۳ در راه سفر گیاهشناسی به آذربایجان (منطقه سیه رود)، تصمیم بر آن شد تا در این مسیر مطالعه‌ای روی گیاهان کوه حیدربابا صورت گیرد. شروع کار در اوایل پاییز بود که درختان تبریزی حیدربابا فصل برگ‌ریزان خود را آغاز کردند و پایان کار نیز به بهار انجامید. بر این اساس، ضمن بررسی منطقه، مطالعات از طریق سه دهستان قیش قورشاق، سنگل‌آباد و خشکتاب آغاز گردید. در این منطقه، نزدیک به ۴۷۰ نمونه از گیاهان این منطقه جمع‌آوری و شناسایی شد و فهرست گیاهان و فرم‌های حیاتی به‌همراه نمودارهای مربوطه تهیه گردید. در پیروی از طبقه‌بندی رون کیه ۵ فرم حیاتی اصلی همی کریپتوفیت‌ها، تروفیت‌ها، کریپتوفیت‌ها، ژئوفیت‌ها، کامفیت‌ها، فانروفیت‌ها را در ساختار گیاهی کوه حیدربابا می‌توان یافت. همچنین در این مقاله، ۱۵۲ گونه گیاهی شامل ۱۱۷ جنس و ۳۳ تیره در آن منطقه شناسایی و معرفی شد.

کلیدواژه‌ها: پوشش گیاهی، حیدربابا، فرم حیاتی.

"Heydarbabaya Salaam" (Hail to Heydarbaba) is an immortal collection of poetry by Mohammad Hossein Shahriar, whose fame has trespassed the limits of time and place. But who, or what, is Heydarbaba, to whom the great poet pays tribute and confides his most intimate sentiments? Heydarbaba, as the poet defines it in an essay, is a height located between Ghareh-chaman and Shangolabad, at the vicinity of Gheishghorshagh village.

In a geographical encyclopedia of Iran, however, Heydarbaba is not listed in the inventory of significant mountains and elevations. Rather, geographically speaking, Heydarbaba is a humble hill as compared to the sky-high mountains of Iran. It is the divine poetry of Shahriar that exalts a humble natural feature to a figurative status envied even by the tallest summits.

As an admirer of "Heydarbabaya Salaam" (Shahriar, 1970), we had a keen interest to study the plants of Heydarbaba Mountain. This, we thought, might contribute in revealing more natural beauty of a scene well-known in the world of poetry. One of the present authors (Mahmoud Moussavi) had the opportunity to perform and conduct such a study. During eight visits to the site in different seasons, he gathered plant samples from about 152 taxa, belonging to 33 families. The samples were then identified and classified in "IRAN" Herbarium (Herbarium Ministerii Iranici Agriculturae). The results are presented in this paper.

Materials and Methods

1) Geographic location:

About 65 km west of Mianeh towards Bostan-abad, there is a village called Ghareh-chaman. An 8.5 km long accessory road, passing through a series of densely arrayed villages, takes you to Gheishghorshagh, from where the eastern front of Heydarbaba Mountain can be approached. The route from this village to the mountain crosses Siah-

Bozghush heights of Sabalan Mountain. The river is easy to cross during the warm seasons of the year, but it inundates in the spring. At about 2.5 km north of Gheishghorshagh there is a village called Shangolabad, from where Heydarbaba can be approached.

An alternative route to Heydarbaba from the Mineh-Bostan-abad road is via Ghezeljeh, which is a village located at 75 km northeast of Mianeh. There is a route from this village to the western front of Heydarbaba, through Gajein, Ghareh-baba and Khoshkenab villages. In the winter, however, this route is extremely difficult to pass. There is a third way to Heydarbaba through Zagluje village at 5 km northeast of Ghareh-chaman, which does not need to cross the river.

As the map of the region shows, the three villages of Gheishghorshagh, Shangol-abad and Khoshkenab form a triangle which encompasses Heydarbaba Mountain. The affinity with Heydarbaba means that these villages are also widely present in the great poet Shahriar's childhood memories. The following extract from a geographical encyclopedia of Iran briefly describes each of these villages (Figure 1).

Gheishghorshagh, is located at $47^{\circ}, 09'$ longitude and $37^{\circ}, 41'$ latitude, 32 km to the southeast of Bostan-abad township and 5 km from the Mianeh to Tabriz road. Its landscape is a plain one, it has a moderate climate and is 1, 700 m above sea level. The majority of its people are occupied in farming and animal husbandry. The main agricultural produce are cereals and pulses. Administratively, the village is part of Abbasi Rural District of Bostanabad Township.

Shanghol-abad, is located at $47^{\circ}, 08'$ longitude and $37^{\circ}, 42'$ latitude, 29 km to the southeast of Bostan-abad township and 5 km from the Mianeh to Tabriz road. Its landscape is a plain one, it has a cold climate, and is 1, 720 m above sea level. The majority of its

people are occupied in farming and animal husbandry. The main agricultural produce are cereals and fruits. Administratively, the village is part of Abbasi Rural District of Bostan-abad Township.

Khoshkenab, is located at $47^{\circ}, 07'$ longitude and $37^{\circ}, 41'$ latitude, 31 km to the southeast of Bostan-abad township and 3 km from the Mianeh to Tabriz road. Its landscape is a plain one, it has a cold climate and is 1,810 m above sea level. The majority of its

people are occupied in farming and animal husbandry. The main agricultural produce are cereals and fruits. This village, too, is part of Abbasi Rural District of Bostan-abad Township.

A main characteristic of these villages is their connection with the Mianeh-Tabriz road. Agriculture is not much developed in this region, mostly due to uneven landscape. Farming is practiced in both irrigated and rainfed forms. Potatoes, onions, wheat,

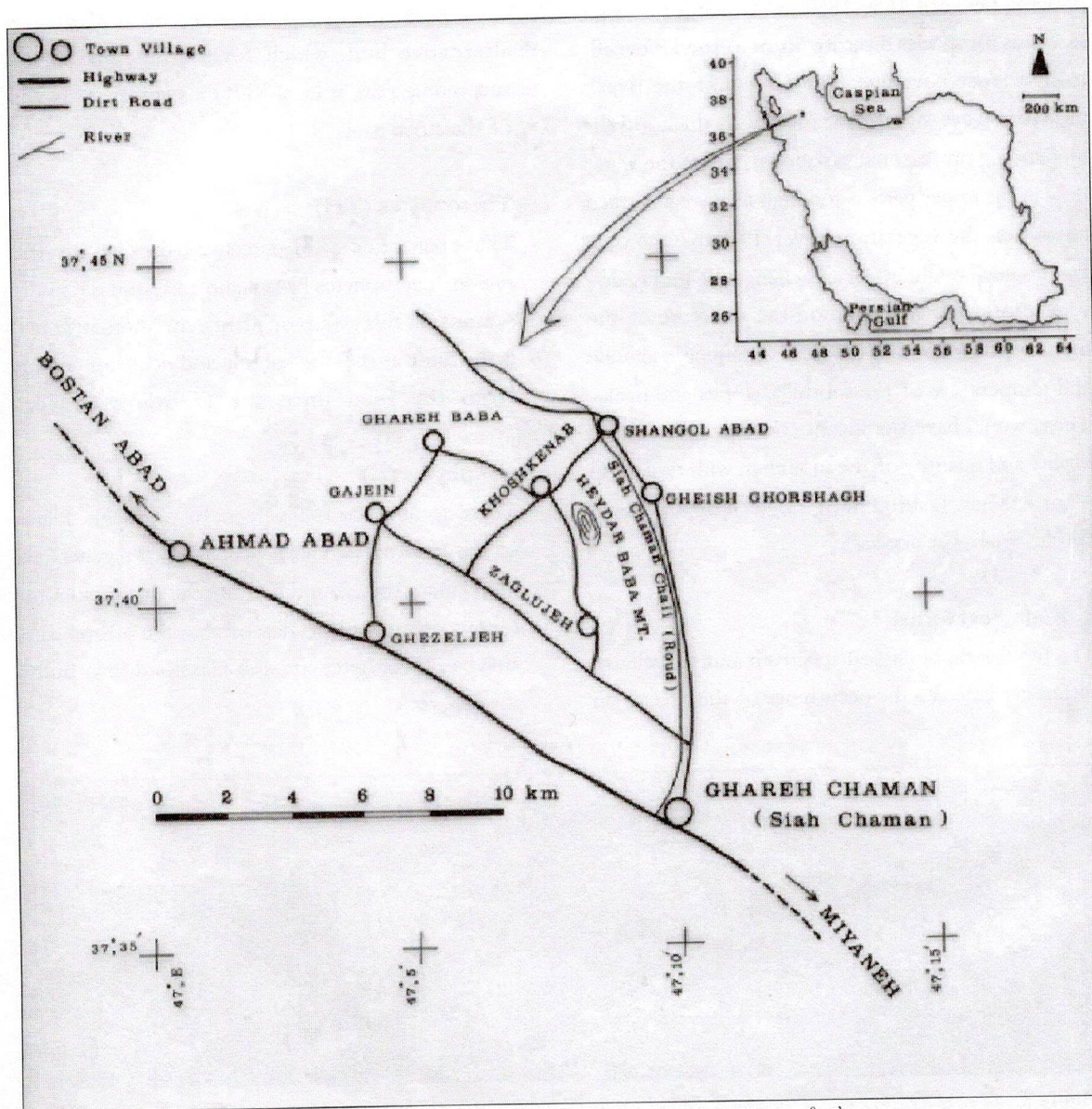


Figure 1. Situation of the Heydar-baba Mountain (Study area situated at latitude $37^{\circ}, 41'$ N and longitude $47^{\circ}, 08'$ E)

barley, apples, and plums are the common products. There are in total 150 households living in these two villages (Gheish-ghorshagh and Shangol-abad). Drinking water is tap, and is complemented by water from springs (Figures 2 and 3).

2- Vegetative situation

The area under study, which is characterized as belonging to the Irano-Turanian region, was too limited to allow any phytosociological treatment in detail since the altitude varies by only 200 meters (ranging between 1650-1850 m.) which is not used as a basis for species diversity. So, most species benefit from a loose coverage. The effects of the river's moisture were significant merely in the foothills (depending on seasonal variations), where the water flow in the upper parts is too high to leave a marked impact on the vegetation cover. Perhaps, the only factor which might effect and change the mountain's vegetation, would depend on the structure of the mountain together with the small variations in altitude and temperature of the foothills, slopes and peaks. These would have significant consequences for the quality and quantity of the mountain with respect to plant species. (a brief note is given against each species wherever needed).

3- Biological forms

The bio forms, biological spectrum and the relative difference between the occurrence of the species on

Heydarbaba mountain can be used only as a relative index in relation to climatic zoning. This is because the area from which the samples were gathered was too small to justify a meaningful ecological delineation. According to Raunkiaer, however, the vegetative structure of Heydarbaba Mountain can be classified into five major bio-forms as follows:

Hemicryptophytes (H)

These constitute 43, 04 percent of the plants on Heydarbaba Mountain, which means that the region has a cold climate. In these perennial plants the alternative bud, which forms the stalk in the succeeding year, is level with the topsoil at the end of the stock root.

Therophytes (TH)

These constitute 27.81 percent of the plants in this region. Therophytes have a short life and die in dry seasons. In this group of plants, the alternative bud is the same as the original one and does not emerge from the seed until the favorable season.

Geophytes (G)

These account for 16.5 percent of the plants. Plants of this form are perennial, keeping their regenerating buds under the ground. During the dry season, the canopy of these plants dies off, but the subsoil parts survive. Geophytes are sub-classified into bulby, rooting, etc.

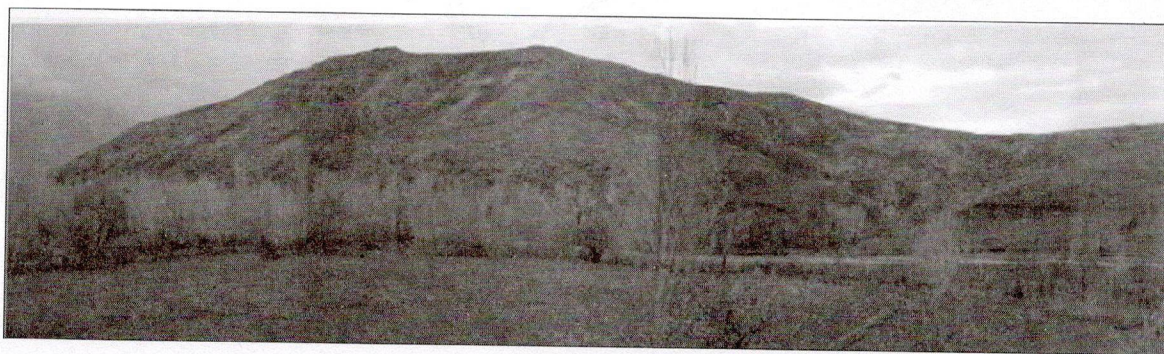


Figure 2. *All along these long years, Heydarbaba, Forked was my way from your youthful company; My count of years expired, yet no return!*
Free translation of the selected poems by Shahriar (poems are originally in the Azari language)

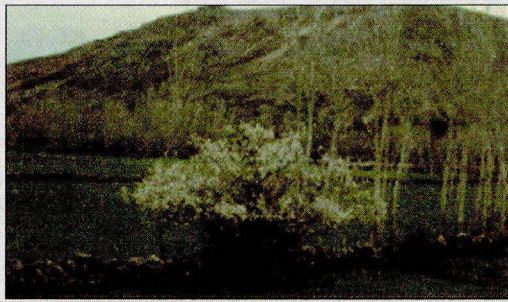


Figure 3. Spring in the foothills of the Heydar-baba mountain.

Chamaephytes (CH)

These constitute 9.27 percent of the species on the mountain. They are sustainable grasses, with relatively woody branches. Their regenerating buds are located above the ground.

Phanerophytes (PH)

At 3.31 percent, these are the least commonly found plants in this region. They include real trees and shrubs, whose alternative buds are above the ground (Figures 4 and 5).

Abbreviated signs of biological forms (H, TH, G, CH, PH) are given against each species.

Observations

4- List of species

Acantholimon Blakelockii MOBAYEN (CH)

Acantholimon Gilliatii TURRILL (CH)

Achillea Biebersteinii AFAN. (CH)

Achillea millefolium L. subsp. millefolium (H)

Achillea millefolium L., together with *Achillea wilhelmsii* C. Koch, is a dominant species in the lower domains and the northern slopes of the mountain.

Achillea talagonica BOISS. (H)

Achillea wilhelmsii C. KOCH (H)

Acinos graveolens (M. B.) LINK (TH)

Aethionema membranaceum DC. (H)

Aethionema membranaceum DC., collected for "Iran" Herbarium for the first time. The typus of this species, was reported to occur in Alvand mountains of Hamadan Province.

Alcea digitata (BOISS.) ALEF. (H)

Alkana orientalis (L.) BOISS. (H)

Allium phaneranthrum BOISS. & HAUSSKN. (G)

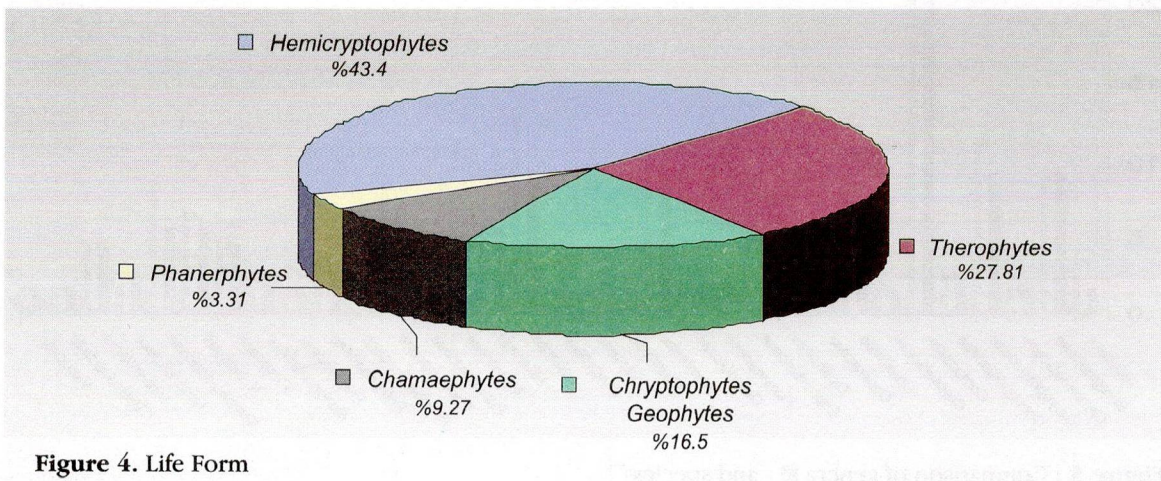


Figure 4. Life Form

- Allium stamineum* BOISS.
Allium sp.
Alyssum bracteatum BOISS. & BUHSE (H)
Alyssum minus (L.) ROTHM. (TH)
Anchusa italica RETZ. var. *italica* (H)
Androsace maxima L. (TH)
Anthemis pseudocotula BOISS. (TH)
Anthemis tinctoria L. (H)
Anthemis Triumfettii (L.) All. subsp. *Triumfettii* (H)
Arabis Aucheri BOISS. (TH)
Arenaria leptoclados (REICHENB.) Guss. (TH)
Asperula arvensis L. (TH)
Astragalus microcephalus WILLD. (s'ect. PLATONYCHIUM) (CH)
Astragalus podocarpus C. A. MEY. (s'ect. MALACOTHRIX) (CH)
Astrodaucus orientalis (L.) DRUDE (TH)
Asyneuma cichoriiforme (BOISS.) BORUM. (H)
Bellevalia pycnantha (C. KOCH) A. LOS. (G)
Bromus Danthoniae TRIN. (TH)
Buffonia macrocarpa SER. (H)
Bupleurum exaltatum M. B. (CH)
Calamagrostis pseudophragmites (HALL. F.) KOEL. (G)
Callipeltis cucullaria (L.) ROTHM. (TH)
Carex stenophylla WAHLENB. (G)
Centaurea Beben L. (H)
Centaurea virgata LAM. subsp. *squarrosa* (WILLD.) GOGLER (H)
Centaurea spp.
Ceratocephala falca (L.) PERS. (TH)
Cerintho minor L. (H)
Chenopodium botrys L. (TH)
Chondrilla Juncea L. (H)
Cichorium Intybus L. (CH)
Cirsium aduncum FISCH & C. A. MEY. (H)
Cirsium congestum FISCH & C. A. MEY. (H)
Colopodium humile (M. B.) GRISEB. (G)
Coronilla varia L. subsp. *varia* (H)
Corydalis persica CHAM. & SCHLECHI. (G)
Cotoneaster nummularioides POJARK. (PH)
Cousinia calocephala JAUB. & SPACH (H)
Crepis foetida L. (TH)

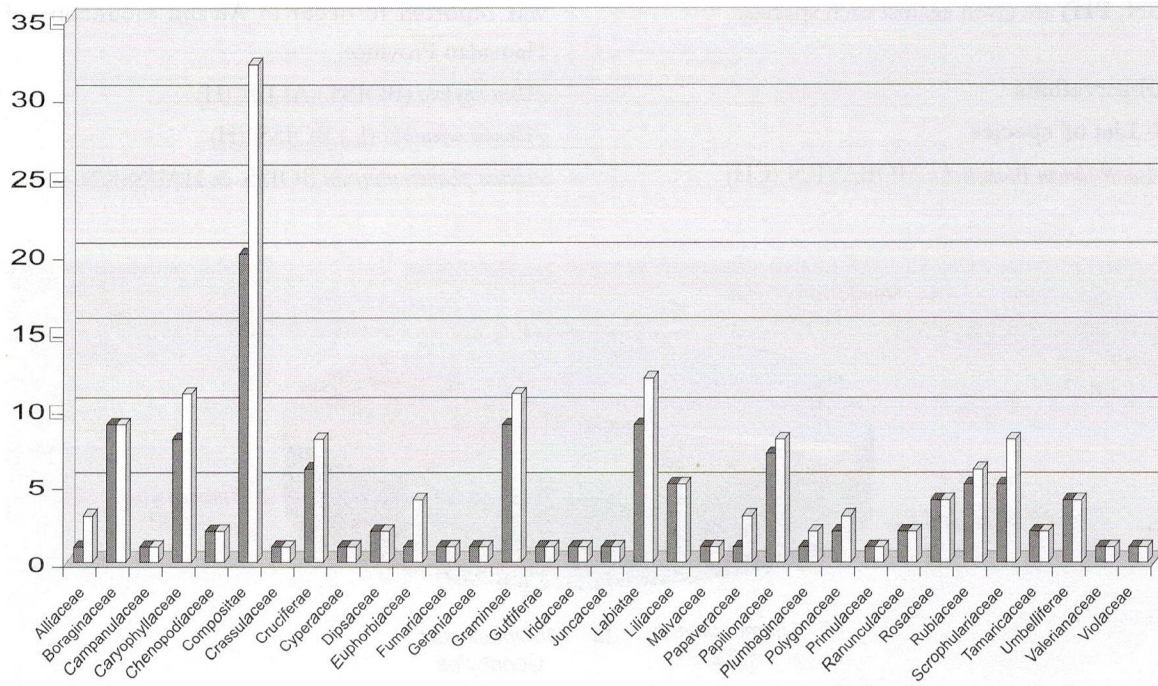


Figure 5 : Comparison of genera ■ and species □

- Crepis sancta* (L.) BABCOCK (TH)
Crucianella excasperata FISCH & C. A. MEY. (TH)
Crucinaella gilanica TRIN subsp. *glauca* (A. RICH. ex DC.) EHREND. (H)
Cruciata taurica (PALL. ex WILLD.) EHREND. (H)
Dactylis glomerata L. subsp. *hispanica* (ROTH) NYMAN (G)
Dianthus orientalis ADAMS subsp. *gilanicus* RECH. F. (H)
Dianthus strictus BANS & SOLAND. Var. *gracilior* (BOISS.) REEVE (H)
Drabopsis verna C. KOCH (TH)
Echinops orientalis TRAUTV. (H)
Echinops ritbrodes BUNGE (H)
Echium italicum L. (TH)
Erysium crassipes FISCH & C. A. MEY. (H)
Erysium cuspidatum (M. B.) DC. (TH)
Eryngium thyrsoideum BOISS. (H)
Euphorbia cf. *Azerbaijdzhanica* BORDZ. (H)
Euphorbia cheiradenia BOISS. & HOHEN. (H)
Euphorbia segneriana NECK. (H)
Festuca ovina L. (G)
Festuca pratensis HUDSON (G)
Ficaria kochii (LEDEB.) IRANSHAHR & RECH. F. (G)
Filago arvensis L. (TH)
Fritillaria kotschyana HERBERT subsp. *kotschyana* (G)
Gagea bulbifera (PALL.) SCHULTES & SCHULTES fil. (G)
Galium nigricans BOISS. (TH)
Geranium persicum SCHÖNBECK-TEMESY (G)
Gypsophila ruscifolia BOISS. (H)
Helichrysum cf. *Pseudoplicatum* NÁB. (H)
Helichrysum rubricundum (C. KOCH) BORNM. (H)
Herniaria glabra L. var. *glaberrima* FENZL (H)
Holosteum umbellatum L. (TH)
Hypericum scabrum L. (H)
Iris reticulata M. B. var. *reticulata* (G)
Juncus inflexus L. (G)
Jurinea macrocephala DC. subsp. *macrocephala* (H)
Koeleria glaucovirens DOMIN (G)
Lagotis stolonifera (C. KOCH) MAXIM. (CH)
Lamium amplexicaule L. var. *amplexicaule* (TH)
Lappula sp.
Leontodon asperimus (WILLD.) BOISS. ex BALL (H)
Lotus corniculatus L. subsp. *corniculatus* (H)
Medicago lupulina L. (H)
Melilotus officinalis (L.) PALL. (H)
Mentha longifolia (L.) HUDSON var. *asiatica* (BORISS.) RECH. F. (H)
Minuartia bamata (HAUSSKN.) MATTF. (TH)
Minuartia Meyeri (BOISS.) BORNM. (TH)
Muscari neglectum GUSS. (G)
Myricaria germanica (L.) DESV. (PH)
Nepeta crassifolia BOISS. & BUHSE (CH)
Nepta fissa C. A. MEY. (CH)
Nonnea persica BOISS. (H)
Odontites Aucheri BOISS. (TH)
Onobrychis altissima GROSSH. (H)
Onosma microcarpum DC. (H)
Papaver argemone L. (TH)
Papaver fugax POIR. (TH)
Papaver piptostigma BIENERT ex FEDDE (TH)
Papacaryum rugulosum (DC.) BOISS. (H)
Phlomis caucasica RECH. F. (CH)
Picnemon Acarna (L.) CASS. (TH)
Poa bulbosa L. (G)
Polygonum patulum M. B. (TH)
Polygonum rottboellioides JAUB. & SPACH (H)
Potentilla hirta L. (H)
Pseudocamelina glaucophylla (DC.) N. BUSCH (H)
Pterocephalus canus COULT. ex DC. (CH)
Rosa caniana L. (PH)
Rumex scutatus L. (G)
Sanguisorba minor SCOP. (H)
Salvia macrosiphon BOISS. (H)
Salvia nemorosa L. (H)
Salsola kali L. subsp. *tragus* (L.) NYMAN (TH)
Scabiosa argentea L. (H)
Scandix stellata BANKS & SOLAND. (TH)
Scariola cf. *viminea* (L.) F. W. SCHMIDT. (TH)
Scorzonera pseudolanata GROSSH. (G)
Scrophularia virgata M.B. subsp. *rupestris* (M. B.) GRAU (H)
Scutellaria pinnatifida A. HAMILT. subsp. *mucida* (STAPF) RECH. F. (H)

Sedum album L. (H)
Senecio vernalis WALDST. & KIT. (TH)
Silene commelinifolia BOISS. var. *comelinifolia* (H)
Silene sisianica BOISS. & BUHSE (H)
Stipa hobenackeriana TRIN. & RUPR. (G)
Stipa holosericea TRIN. (G)
Taeniatherum crinitum (SCHREB.) NEVSKI (TH)
Tamarix ramosissima LEDEB. (PH)
Taraxacum montanum (C. A. MEY.) DC. (H)
Taraxacum cf. *spinulosum* V. S. (H)
Thymus Fedtschenkoi RONNIGER (CH)
Tragopogon cf. *Vvedonskyi* M. POP. ex PAVLOV (H)
Trigonella monantha C. A. MEY. subsp. *Noëana* (BOISS.)
HUBER-MORATH (TH)
Tulipa systola STAPF (G)
Valerianella carinata LOISEL. (TH)
Verbascum speciosum SCHRAD. (H)
Veronica biloba SCHREB. (TH)
Veronica kurdica BENTH. subsp. *kurdica* (CH)
Veronica orientalis MILLER (CH)
Veronica triphylla L. (TH)
Viola oculata LEHMAN (TH)
Xeranthemum squarrosum BOISS. (TH)
Ziziphora capitata L. subsp. *orientalis* SAMUELSSON
ex Rech. f. (TH)
Ziziphora clinopodioides LAM. subsp. *rigida* (BOISS.)
RECH. F. (H)

5- List of Localities

Symbols of “Mm-1- Mm-8”, are contractions of collector(s) number used in locality, i. e. Moussavi, mahmoud-1...

(Mm-1) Azarbaijan: Miyaneh to Bostan-abad, Ghareh-chaman (Siah-chaman), Shangol-abad, kuh-e Heydar-baba, 1700-1800m., 4. 8. 1994, Moussavi & Tehrani.
(Mm-2) Azarbaijan: Miyaneh to Bostan-abad, Ghareh-chaman, Shangol-abad, kuh-e Heydar-baba, 1750-1850m., 25. 4. 1995, Moussavi & Termeh.
(Mm-3) Azarbaijan: Miyaneh to Bostan-abad, Ghezeljeh, khoshkenab (via Gajein), kuh-e Heydar-baba, 1700-1830m., 26. 6. 1995, Termeh & Moussavi.

(Mm-4) Azarbaijan: Miyaneh to Bostan-abad, Ghareh-chaman, Gheish-ghorshagh, kuh-e Heydar-baba, 1650-1800m., 27. 6. 1995, Moussavi & Termeh.
(Mm-5) Azarbaijan: Miyaneh, Ghezeljeh, Khoshkenab (Via Gajein), Kuh-e Heydar-baba, 1750-1820m. 14. 8. 1995, Moussavi & Tehrani.
(Mm-6) Azarbaijan: Miyaneh, Ghareh-chaman, Gheish-ghorshagh, Kuh-e Heydar-baba, 1670m., 15. 8. 1995, Moussavi & Tehrani.
(Mm-7) Azarbaijan: Miyaneh to Bostan-abad, Ghareh-chaman, Gheish-ghorshagh, Kuh-e Heydar-baba, 1700-1800m. 21. 11. 1995, Moussavi & Tehrani.
(Mm-8) Azarbaijan: Miyaneh to Bostan-abad, Ghareh-chaman, Gheish-ghorshagh, Kuh-e Heydar, baba, 1750-1820m. 14. 10. 1996, Moussavi & Tehrani.

6- List of plants

To avoid reptition of the localities on which our specimens have been collected, and for the sake of brevity, the plant list itself only gives the “locality number”, which was previously described.

Alliaceae:

Allium phaneranthemum BOISS. & HAUSSKN. (Mm-5, Mm-6)
Allium stamineum BOISS. (Mm-4)
Allium sp. (Mm-3)

Boraginaceae:

Alkana orientalis (L.) BOISS. (Mm-2, Mm-3)
Anchusa italica RETZ. var. *italica* (Mm-3)
Cerithe minor L. (Mm-4)
Echium italicum L. (Mm-5, Mm-6)
Lappula sp. (Mm-2)
Lithospermum arvense L. (Mm-3)
Nonea persica Boiss. (Mm-2)
Onosma microcarpum DC. (Mm-3, Mm-7) Figure 6
Parocaryum rugulosum (DC.) BOISS. (Mm-3)

Campanulaceae:

Asyneuma cichoriiforme (BOISS.) BORNHM. (Mm-4)

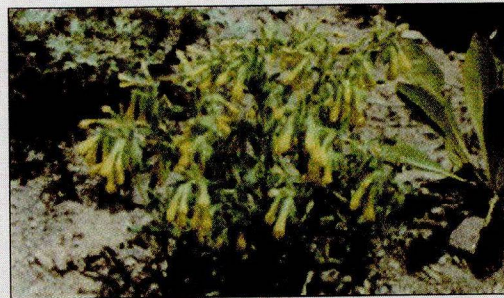


Figure 6. *Onosma microcarpum* DC.

Caryophyllaceae:

- Arenaria leptoclados* (REICHENB.) GUSS. (Mm-3)
Buffonia macrocarpa SER. (Mm-3, Mm-4)
Dianthus orientalis ADAMS subsp. *gilanicus* RECH. f. (Mm-1, Mm-3, Mm-6)
Dianthus strictus BANKS & SOLAND. var. *gracilior* (BOISS.) REEVE (Mm-3)
Gypsophila ruscifolia BOISS. (Mm-4, Mm-6)
Herniaria glabra L. var. *glaberrima* FENZL (Mm-3)
Holosteum umbellatum L. (Mm-2)
Minuartia hamata (HAUSSKN.) MATTF. (Mm-3)
Minuartia Meyeri (BOISS.) BORNM. (Mm-3)
Silene commelinifolia BOISS. var. *commelinifolia* (Mm-3, Mm-4).
Silene sisianica BOISS. & BUHSE (Mm-3)

Chenopodiaceae:

- Chenopodium botrys* L. (Mm-7)
Salsola kali L. subsp. *tragus* (L.) NYMAN (Mm-8)

Compositae:

- Achillea Biebersteinii* AFAN. (Mm-3)
Achillea millefolium L. subsp. *millefolium* (Mm-4)
Achillea talagonica BOISS. (Mm-4)
Achillea wilhelmsii C. KOCH (Mm-6)
Anthemis pseudocotula BOISS. (Mm-3)
Anthemis tinctoria L. (Mm-4)
Anthemis Triumfettii (L.) ALL. subsp. *Triumfettii* (Mm-4)
Centaurea Beben L. (Mm-1) Figure 7
Centaurea virgata LAM. Subsp. *squarrosa* (WILLD.)

GUGLER (Mm-1, Mm-7, Mm-8)

Centaurea spp. (Mm-3, Mm-4)

Chondrilla juncea L. (Mm-1, Mm-5, Mm-7, Mm-8)

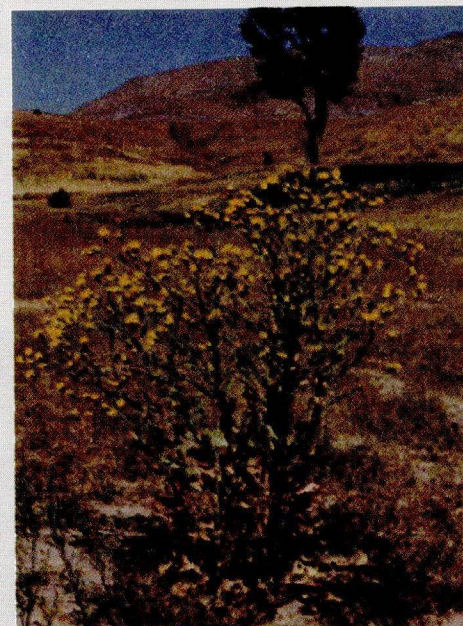


Figure 7. *Centaurea Beben* L.

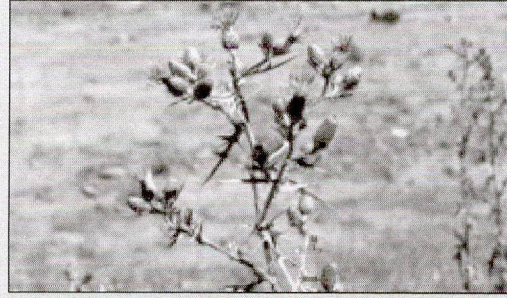
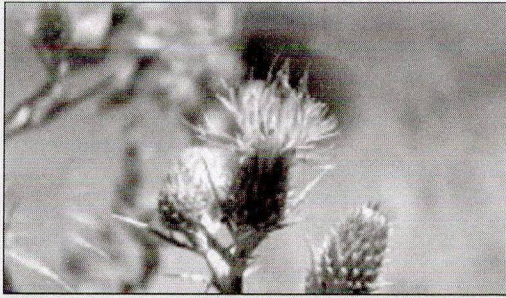


Figure 8. *Cirsium aduncum* FISCH. & C. A. Mey.

Cichorium Intybus L. (Mm-8)
Cirsium aduncum FISCH. & C. A. M. (Mm-1, Mm-5, Mm-7, Mm-8) Figure 8
Cirsium congestum FISCH. & C. A. M. ex DC. (Mm-5, Mm-7)
Cousinia calocephala JAUB. & SPACH (Mm-3, mm-4, Mm-5)
Crepis foetida L. (Mm-1)
Crepis sancta (L.) BABCOCK (Mm-3)
Echinops orientalis TRAUTV. (Mm-5, Mm-6)
Echinops ritbrodes BUNGH (Mm-1) Figure 9
Filago arvensis L. (Mm-3)
Helichrysum rubicundum (C. KOCH) BORNM. (Mm-4)
Helichrysum cf. Pseudoplicatum NÁB. (Mm-3, Mm-7)
Jurinea macrocephala DC. subsp. *macrocephala* (Mm-1, Mm-6) Figure 10
Leontodon asperimus (WILLD.) BOISS. ex BALL (Mm-4)
Picnomon Acarna (L.) CASS. (Mm-8)
Scariola cf. viminea (L.) F. W. SCHMIDT (Mm-8)

Scorzonera pseudolanata GROSSH. (Mm-2) Figure 11
Senecio vernalis WALDST. & KIT. (Mm-3, Mm-5)
Taraxacum montanum (C. A. MEY.) DC. (Mm-5) Figure 12
Taraxacum cf. spinulosum V. S. (Mm-2)
Tragopogon cf. Vvedonskyi M. POP. ex PAVLOV (Mm-3)
Xeranthemum squarrosum BOISS. (Mm-1, Mm-4, Mm-5, Mm-7) Figure 13

Crassulaceae:

Sedum album L. (Mm-3)

Cruciferae:

Aethionema membranaceum DC. (Mm-6)
Alyssum bracteatum BOISS. & BUHSE (Mm-3)
Alyssum minus (L.) ROTTM. (Mm-3)
Arabis Aucheri BOISS. (Mm-2)
Drabopsis verna C. KOCH (Mm-2)
Erysimum crassipes FISCH. & C. A. MEY. (Mm-3, Mm-4)

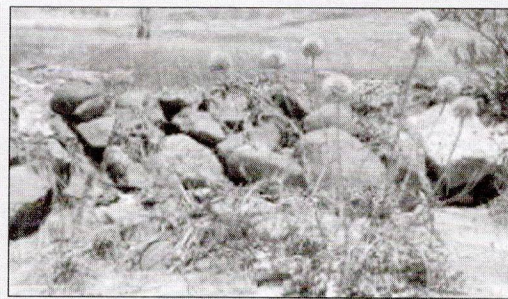
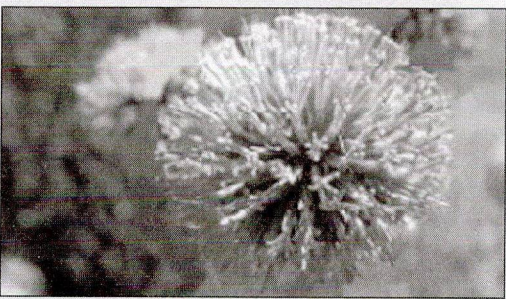


Figure 9. *Echinops ritbrodes* BUNGE.

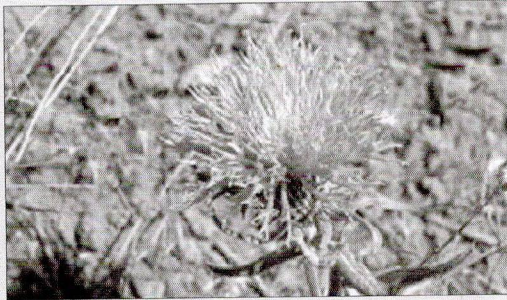


Figure 10. *Jurinea macrocephala* DC. subsp. *Macrocephala*.



Erysimum cuspidatum (M. B.) DC. (Mm-3)

Pseudocamelina glaucophylla (DC.) N. BUSCH (Mm-8)

Cyperaceae:

Carex stenophylla WAHLENB. subsp. *stenophylloides* (V. KREJCZ.) EGOR. (Mm-2)

Dipsacaceae:

Pteroccephalus canus COULT. ex DC. (Mm-3)

Scabiosa argentea L. (Mm-6, Mm-8)

Euphorbiaceae:

Euphorbia cf. *Azerbaijani* BORDZ. (Mm-3)

Euphorbia cheiradenia BOISS. & HOHEN. (Mm-3, Mm-4)

Euphorbia seguieriana NECK. (Mm-1, Mm-5, Mm-8)

Figure 14

Fumariaceae:

Corydalis persica CHAM. & SCHLECHT. (Mm-2)

Geraniaceae:

Geranium persicum SCHÖNBECK-TEMESY (Mm-2)

Gramineae:

Bromus Dantboniae TRIN. var. *lanuginosus* ROSHEV. (Mm-3)

Calamagrostis pseudophragmites (HALL. F.) KOEL. (Mm-4)

Colpodium humile (M. B.) GRISEB. (Mm-3)

Dactylis glomerata L. subsp. *hispanica* (ROTH) NYMAN (Mm-6)

Festuca ovina L. (Mm-3)

Festuca pratensis HUDSON (Mm-3, Mm-4)

Koeleria glaucovirens DOMIN (Mm-4)

Poa bubosa L. (Mm-2)

Stipa bobenackeriana TRIN. & RUPR. (Mm-3)

Stipa holosericea TRIN. (Mm-4)

Taeniatherum crinitus (SHREB.) NEVSKI (Mm-3)

Guttiferae:

Hypericum scabrum L. (Mm-3, Mm-5, Mm-7, Mm-8)

Iridaceae:

Iris reticulata M. B. var. *reticulata* (Mm-2)

Juncaceae:

Juncus inflexus L. (Mm-4, Mm-6)

Labiatae:

Acinos graveolens (M. B.) LINK (Mm-3)

Lamium amplexicaule L. var. *amplexicaule* (Mm-2)



Figure 11. *Scorzonera pseudolanata* GROSSH.

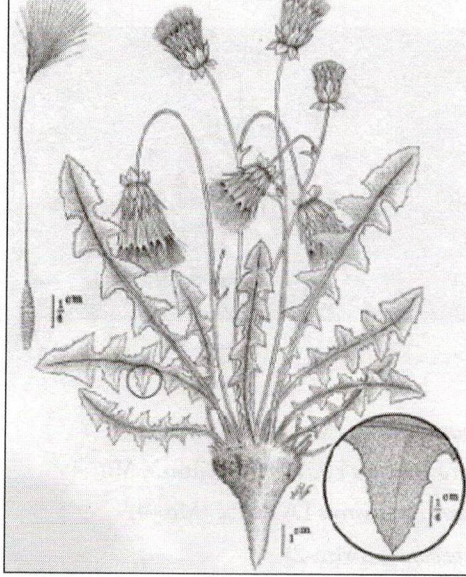


Figure 12. *Taraxacum montanum* (C. A. MEY.)

Mentha longifolia (L.) HUDSON var. *asiatica* (BORISS.)
RECH. F. (Mm-6)

Nepeta crassifolia BOISS. & BUHSE (Mm-4)

Nepeta fissa C. A. MEY. (Mm-1, Mm-6, Mm-8)

Phlomis caucasica RECH. F. (Mm-4)

Salvia macrosiphon BOISS. (Mm-4) Figure 15

Salvia nemorosa L. (Mm-3, Mm-4, Mm-6)

Scutellaria pinnatifida A. HAMILT. subsp. *mucida*
(STAPF) RECH. f. (Mm-3)

Thymus fedtschenkoi RONNIGER (Mm-3)

Ziziphora capitata L. subsp. *orientalis* SAMUELSSON
ex RECH. F. (Mm-3)

Ziziphora clinopodioides LAM. subsp. *rigida* (BOISS.)
RECH. F. (Mm-1, Mm-5, Mm-6) Figure 16



Figure 14. *Euphorbia seguieriana* NECK.

Liliaceae:

Bellevalia pycnantha (C. KOCH) A. LOS. (Mm-2)

Fritillaria kotschyana HERBERT subsp. *kotschyana* (Mm-2)

Gagea bulbifera (PALL.) SCHULTES & SCHULTES



Figure 13. *Xeranthemum squarrosum* BOISS.





Figure 15. *Salvia macrosiphon* BOISS.
A *Salvia* species which is commonly grown in the plains of the Heydar-baba.

fil. (Mm-2)

Muscari neglectum GUSS. (Mm-2)

Tulipa systola STAPF (Mm-2)

Malvaceae:

Alcea digitata (BOISS.) ALEF. (Mm-1, Mm-5) Figure 17

Papaveraceae:

Papaver argemone L. (Mm-3)

Papaver fugax POIR. (Mm-4)

Papaver piptostigma BIENERT ex FEDDE (Mm-3)

Papilionaceae:

Astragalus (*Platonychium*) *microcephalus* WILLD. (Mm-2, Mm-5, Mm-7)

Astragalus (*Malacothrix*) *Podocarpus* C. A. MEY. (Mm-3)

Coronilla varia L. subsp. *varia* (Mm-4) Figure 18

Lotus corniculatus L. subsp. *corniculatus* (Mm-4) Figure 19

Medicago lupulina L. (Mm-4)

Melilotus officinalis (L.) PALL. (Mm-8)

Onobrychis altissima GROSSH. (Mm-4)

Trigonella monantha C. A. MEY. subsp. *Noeana* (BOISS.)

HUBER-MORATH (Mm-3, Mm-4)

Plumbaginaceae:

Acantholimon Blakelockii MOBAYEN (Mm-3)

Acantholimon Gilliatii TURILL (Mm-3, Mm-5)

Polygonaceae:

Polygonum patulum M. B. (Mm-3)

Polygonum rottboellioides JAUB. & SPACH (Mm-3)

Rumex scutatus L. (Mm-5, Mm-6)

Primulaceae:

Androsace maxima L. (Mm-2)

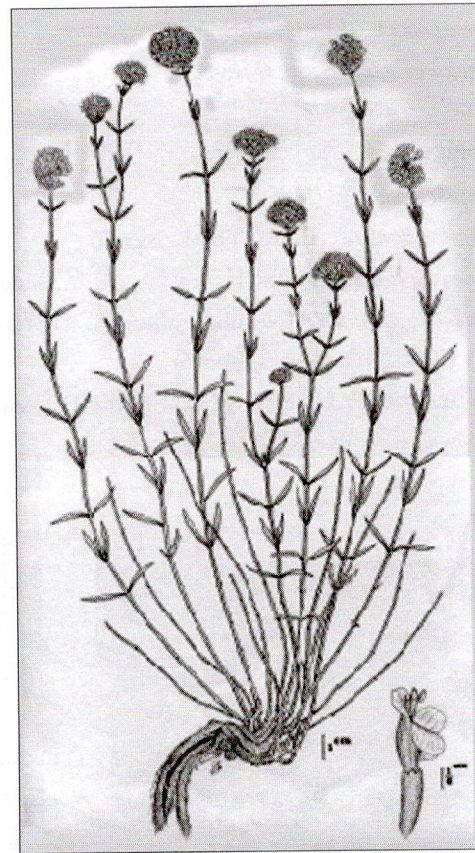


Figure 16. *Ziziphora clinopodioides* LAM.
subsp. *rigida* (BOISS.) RECH. F.

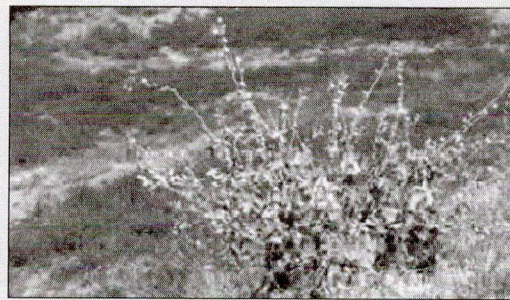
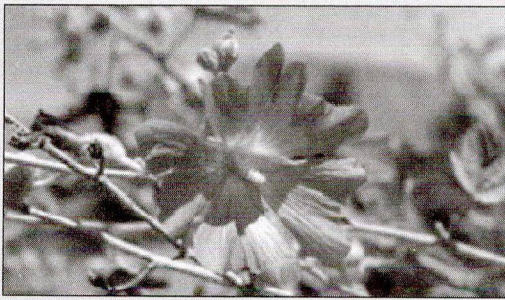


Figure 17. *Alcea digitata* (BOISS.) ALEF.

Ranunculaceae:

- Ceratocephala falcata* (L.) PERS. (Mm-2)
Fivaria kochii (LEDEB.) IRANSHAHR & RECH. F.
 (Mm-2)

Rosaceae:

- Cotoneaster nummularioides* POJARK. (Mm-5, Mm-8)
Potentilla birta L. (Mm-3)
Rosa caniana L. (Mm-1, Mm-2)
Sanguisorba minor Scop. (Mm-3)

Rubiaceae:

- Asperula arvensis* L. (Mm-3)
Callipeltis cucullaris (L.) ROTHM. (Mm-3)
Crucianella exasperata FISCH. & C. A. MEY. (Mm-3)
Crucianella gilanicum TRIN. subsp. *glauca* (A. RICH. ex
 DC.) EHREND. (Mm-3, Mm-6)
Cruciata taurica (PALL. ex WILLD.) EHREND. (Mm-2)
Galium nigricans BOISS. (Mm-3)

Scrophulariaceae:

- Lagotis stolonifera* (C. KOCH) MAXIM. (Mm-2)
Odontites Aucheri BOISS. (Mm-3)
Scrophularia virgata M. B. subsp. *rupestris* (M. B.) GRAU
 (Mm-3, Mm-4, Mm-5, Mm-6)
Verbascum speciosum SCHERAD. (Mm-3, Mm-4, Mm-
 5, Mm-6, Mm-8)
Veronica biloba SCHREB. (Mm-2)
Veronica kurdica BENTH. subsp. *kurdica* (Mm-4)
Veronica orientalis MILLER (Mm-2)
Veronica triphylla L. (Mm2)

Tamaricaceae:

- Myricaria germanica* (L.) DESV. (Mm-4)
Tamarix ramosissima LEDEB. (Mm-3)

Umbelliferae:

- Astrodaucus orientalis* (L.) DRUDE (Mm-6)
Bupleurum exaltatum M. B. (Mm-1, Mm-5, Mm-6)



Figure 18. *Coronilla varia* L.

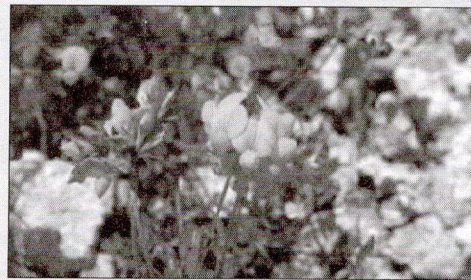


Figure 19. *Lotus corniculatus* L. subsp. *Corniculatus*.

Two species of Papilionaceae family with fantastic clusters extending a fascinating scene to Heydar-baba mountain.

Eryngium thyrsoideum BOISS. (Mm-6, Mm-7, Mm-8)
Scandix stellata BANKS & SOLAND. (Mm-2)

Valerianaceae:

Valerianella carinata LOISE. (Mm-2)

Violaceae:

Viola occulta LEHMANN (Mm-2, Mm-3)

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