Scientific report (preliminary)-2013 – RSGF

The aim of project 13191-1 was to elucidate the conservation status of ten species of the Umbelliferae family included in Red Data Book of Tajikistan, which is currently being prepared for publication. The species are *Aulacospermum ikonnikovii, Cephalopodum badachschanicum, Ferula decurrens, F. kosopoljanskyi, Galagania gracilis, Hyalolaena melanorrhiza, Kafirnigania hissarica, Parasilaus asiaticus, Seseli rimosum*, and *S. sclerophyllum*.

The field works were performed during the period from July, 23 to August, 16, 2013 in Khatlon province, Gorno-Badachschan Authonomous Region, as well in some areas under jurisdiction of Dushanbe (officially named as "the regions subordinated rightly to Dushanbe", here marked conditionally as "Dushanbe province")., The total length of car routes is km. Some observations are planned for autumn 2013 and spring of 2014.

The data obtained are summarized below, by species.

Aulacospermum ikonnikovii Kamelin

This monocarpic species was described (Kamelin, 2000) based on the material collected by (D.Nawruzshoev), one of the present project participants. He also saw the plants later in nature. The species has an isolated taxonomic position in its genus. It is known to grow in the only locality – "Tajikistania, Regio Badachschania, jugum Jazgulemicum, in valle fl. Bartang, in parietibus abruptis faucium Spondzh (Sipanszh), alt. ca 3,000 m, 08.07.1991, *Navruzschoev".* The species is a component of petrophyton, growing in rock fissures in spring valleys on southern slopes of the Yazgulem ridge. In the type locality, there are no more than 20 generative and vegetative plants of *A. ikonnikovii*, growing in the canyon of Khidorzhir riv. (h=2,900 m a.s.l.) on a sheer face above an impetuous mountain stream together with *Silene brachuica, Pipthaterum alpestre, Rosa korshinskyi, Tanacetopsis subsimilis* and some other rocky plants. The locality is near a settlement and difficult to access; but in the future may well be destroyed in the course of new road construction.
The species is to be qualified as CR (critically endangered) [A1a, c; B1b (i, iv)

Cephalopodum badachschanicum Korovin

The species was described in 1973 by the prominent botanist E.P.Korovin (Korovin, 1975); the type locality is Obi-Charak Canyon in Darwaz ridge. Firstly, the species was collected in 1927. There are several known localities (all within Tajik Badachschan territory): S slope of Darwaz ridge, basin Obi-Chumbou, Dudarchi gorge, rocks; S slope of Darwaz ridge, Pshent, on the rocks; Darwaz ridge, S slope, valley of Obi-Chorok, below Pobot village; Badachschan, basin of Yazgulem, Chavud gorge; N slope of Yazgulem ridge, basin Darai-Matrab, 1900m, rocks; W Pamirs, Yazgulem ridge, near Voznaud village; Yazgulem range, valley of Pjandzh River, near Shipad village; between Shipad village and Yazgulem mouth; Yazgulem, basin of Darai-Matravn; valley of Pjandzh River, Shidz village; N slope of Ruchan ridge, basin of Bartang River, near Adjarkh village, in roch fissures; Bartang gorge, near Rid village, 2,200 m; Bartang River, Palrud village, rocks; W Pamirs, Ruchan ridge, Barkhuf, right bank, 2,100 m, rocks; Rushan, ovring, Kallad. We revealed the populations of *C. badachschanicum* in Pjandzh River valley near Zebardascht village (alt. 2040 m, the uppermost locality in Pjandzh

valley on the right bank), near Shipad, Dekh, Kalat, Pozgard, Shidz, Vashd, Derushon, between Bartang mouth and Pastkhuf village, Voznavad. Between Badzhudara mouth and Dasht village, between Dasht and Chekhikandiz. Additionally we found at the first time the species in Afghanistan, on the left bank of Pjandz River in two localities – near Chosnudi-bolo, and near Khust (opposite of Khorog, 37°44,99'N, 71°32,93'E, h=2070 m a.s.l.); the last is the uppermost locality on the left bank. The status of most populations is normal, as they contain both generative and vegetative specimens. During the year 2013 the species, unlike all local *Ferula* species, (has fruiting plants) bore with mature fruits. The distance among specimens is from 0.5 to 20-50 m. *C. badachschanicum* grows in rock fissures and is part of petrophyton, together with *Acantholimon varivtzevae, Ephedra intermedia, Anaphalis virgata, Artemisia vachanica, Tanacetopsis subsimilis, Rosa korshinskyi, Scariola orientalis, Scutellaria schugnanica*, *Lindelophia macrostyla, Pipthatherum alpestre, Melica canescens, Silene schugnanica* and so on.
The species can be qualified as NT (near threatened)

Ferula decurrens Korovin

A polycarpic (the life-form was clearly detected during the present studies) herbaceous plant, endemic to South Tajikistan. Four localities are known only ap to now: "Tadjikistan, Pjandzh River, red sandstones near Bag village in valley of Schpiljau rivulet (type specimen);"S Tajikistan, SE part of South Tajik depression, 3 km W of Sarygor, left bank of Kafirkach rivulet, screes, 1350 m"; "Tajikistan, basin of Pjandzh River, l the left bank of riv. Obi-Niou, W slope of Kuh-i Frusch, near Vaglil village, 1700 m."and "S Tajikistan, Karatau (Pripjandzhsky Karatau) Mts., the pass between Parkhar and Nizhni Pjandzh, red sandstones" (in this locality the species was firstly collected in 1937). We checked the natural populations in two localities (Bag and Parkhar-Pjandzh pass), as near Vaglil the plant can hardly be found at all. (Observation of 1975). The two localities differ considerably in their *F. decurrens* populations. In Schpiljau valley (former Bag village) the species, growing on red sandstones, is extremely rare. It was found on the left bank, at the altitude 720 m a.s.l. and can be detected only by dried rosette leaves on rock bases, as there were no generative plants in 2013 season. Only one sandstone precipice was revealed now as a habitat of *F. decurrens* population; the number of specimen appearing no more than one or two hundred. The species had also been previously collected also on the right bank. The population of Karatau (37°17, 45'N, 69°18, 38'E, h=800 m) is incomparably larger; here the species is not rare on the north steep slopes and alluvial hollows of the sandstone massif, situated on western macroslope of the ridge near the pass. *F. decurrens* grows here together with *Bromus oxyodon, Pistacea vera, Zygophyllum bucharicum, Andrachne rotundifolia, Cleome lipskyi, Aegilops sp., Amygdalus bucharica, Delphinium semibarbatum, Ferula tadshikorum, Galagania fragrantissima, Atriplex moneta, Convolvulus campanulatus, Gamanthus commixtus, Pulicaria salvifolia, Salsola orientalis* and other species. The opposite slopes are covered with the so called low-herbaceous semi-savanna with *Pistacia vera.* The total area of slopes and hollows with *F. decurrens* is estimated as 20-35 ha, the number of *F. decurrens* plants being 10,000-40,000.
So, the qualification of the species in the IUCN categories is EN (endangered) [A2a; B1a, c, 2c] (mainly based on the Karatau population).

Ferula kosopoljanskyi Lipsky ex Korovin

Monocarpic herbaceous plant, endemic to Tajikistan. At least 9 separate localities are known, mainly in Gorny Badachschan, but also in adjacent regions of Khatlon province:

"Buchara, Darwaz, Pjandzh River" (type specimen); "Buchara, Darwaz, riv. Vischarvi, tributary of Pjandzh River"; "Tajikistan, Badachschan, S slope of Darwaz Mts, mouth of Poshkharv rivulet"; "Darwaz ridge, Khaburabad pass, S slope, descent to riv. Obi-Kharak"; "Tajik Badachschan, Darwaz ridge, canyon above Barau village"; "Badachschan, Vansch ridge, canyon Khikhik, h=1900 m"; "Yazgulem River, near the mouth"; "Tajikistan, S slope of Peter I ridge, basin of Sangvor River, riv. Obi-Yekhg near Saed village"; "Tadjikistan, S slope of Peter I ridge, valley of Obichingou River, Dachti-Khasan village", "Khatlon province, S extremity od Kuh-i Frush Mt., former village of Kala-i Kunja, screes", our collection of 2012;.The species is regarded as endemic to Tadjikistanian; however, in LE herbarium there is a collection from "Darwaz, Omar ad fluvii Pändsch, rip. sinist. IX.1882. A. Regel", i.e. from the left bank of Pjandzh, that is now in Afghanistan. We also observed (across the Pjandzh River) a population of *F. kosopoljanskyi* in Afghanistan, opposite to Dashtak and Poshkharv villages on the Tajik territory. During our trip from Khaburabad pass in the Darwaz ridge and valley of the Vansch River, *F. koso-poljanskyi* we saw it several times, for instance between Kurgovat and Togmai and near Dashtak. The population of the southern slope of the pass, above Rabat (38º33, 34'N, 70º47, 76'E, h= 2270 m), grows on steep screes, under rocks. The species grows in association with *Incarvillea olgae, Hypericum scabrum, Echinops maracandicus, Tetrataenium olgae, Silene pamirensis, Pseudohandelia umbellifera, Eremurus stenophyllus, Poterium polygamum, Scariola orientalis, Calamagrostis alajica, Asperula ferganica , Datisca cannabina, Tanacetopsis czukaviniae*, sometimes also with *Prangos pabularia* and *Mediasia macrophylla*. We mapped some contours of the *F. kosopoljanskyi* population fragments with a total area 4.5 ha. The distances between plants of *F. kosopoljanskyi* vary from 25 to 300 (132±47) cm within contours. Mean number of plants in this population is 33450. Similar fragments were observed up to the mouth of Obi-Kharak rivulet (h=1,680 m) and along Obi-Khumbou River several kilometers above the Obi-Kharak mouth and below – almost up to Kalai-Khumb. The total number of plants in the region can be estimated as no less than 100,000. Populations in the Obichingou basin are considerably smaller, although they may add 20,000 plants in total.
As a result, the proposed conservation status of *F. kosopoljanskyi* is VU (vulnerable) [A4, B1a]

Galagania gracilis (Kamelin & Pimenov) Kamelin & Pimenov

This monocarpic species was previously described in *Elaeosticta*, and later, after mature fruit investigation, was transferred to *Galagania* (Kamelin & Pimenov, 1981). It is a Tajikistanian endemic, distributed in Darwaz, Vakhsch, and Peter I ridges, mainly in the basin of the Obichingou River. There are six known localities in this region : "Tajikistan, S slope of Peter I ridge, valley of Obichingou River, Kaftarguzar village@ (type locality), "N slope of the Darwaz Ridge, valley of the Obichingou River, Nurynch (Nuranch) village"; "N slope of the Darwaz Ridge, near Tavildara airport, Bok-cha village, shrubs"; "Tajikistan, S slope of Peter I ridge, valley of Obichingou River, Daschtigurk village, *Exochorda* shrubs"; "Tajikistan, S slope of Peter I ridge, valley of Obichingou River, Daschti-Khasan village", Vakhsch ridge, opposite settlement Rogun". We studied the population near Nurynch (left bank of the Obichingou River, 38º 50, 74'N, 70º08, 85'E, h=1460 m), where *G. gracilis* is a mass plant in sparse shrubby vegetation of *Acer regelii, Prunus mahaleb, Crataegus soongarica, Lonicera korolkovii, Caragana turkestanica* with herbaceous layer with *Ziziphora pamiroalaica, Hypericum scabrum, Achillea filipendulina, Origanum tythanthum, Incarvillea olgae, Hordeum bulbosum, Elaeosticta hirtula, Poterium polygamum* etc. The area of population is near 0.3 ha, the distance between *Galagania* plants are 20-30 cm. The estimated number of specimens is 27,000-

75,000. Another similar population was found on the left bank of Obichingou, above of the bridge of the Tavildara - Kalai-Khumb road (38°44, 57'N, 70°38, 80'E, h=1680). The ecology and abundance of *G. gracilis* in this locality is similar, however the main dominant shrub is *Exochorda albertii*. The locality belongs to the territory of Gorny Badachschan, and so, the species was first found in? The Badachschan Autonomous (province) oblast. Although the populations in Obichingou valley are situated near roads and settlements, they are hardly ever grazed, as dense shrubs are rarely used as pastures.
The species can be related to the category VU (vulnerable) [Aa, c, B1a]

Hyalolaena melanorhiza Pimenov & Kljuykov

The species was found and described by the participants of the present project (Pimenov & Kljuykov, 1983).There is only one known locality, in which the plant was collected two times – in 1969 and 1981. The locality is situated in Gorny Badachschan ("Badachschan, the Yazgulem Range, valley of the Pjandzh River, between Shipad village and Shizgu spring, the scree on the northern slope". Both times the plant was collected at the stage of mature fruits, after vegetation. In 2013, however, despite thorough search in all possible localities between Shipad and Shizgu no specimen were found. There can be two reasons for that – either unfavorable weather conditions in 2013 spring and summer, when the generative plants could not develop, or extinction of the population, previously observed near the reconstructed road. We hope the first is the most probable, are planning to visit the locality once again next spring (D. Navruzshoev). According to the present data, the species can by qualified as CR (critically endangered) [A1a, B1a, 2a]

Kafirnigania hissarica (Korovin) Kamelin & Kinzik.

The species, known in botanical literature as *Peucedanum hissaricum* Korovin, is endemic to Sarda-i Miona valley, east of the Hissar Ridge (Duchanbe province). A limited number of localities in this valley are known, mainly on the rocks of the right bank: "Bukhara, between Arkhu and Sarda-i-miona"|(first collection of 1896, probably in valley of Arkhu riv.); "Bukhara khanat, Hissar district, rocks in Sarda-i Miona valley, below Guskef"; "Pamir-Alaj, montes Hissarici, vallis fl. Sarda-i-miona" (type specimen); "Tajikistan, basin of Kafirnigan River, rocks on right bank of Sarda-i Miona, near Kokhu village", "S Tajitistan, southern slope of Hissar Mts., Kokhu village"; "Hissar ridge, valley of Sarda-i Miona, Vistan village". Our observations showed the distribution of the species on the right bank of |Sarda-i Miona at altitudes from 1,350 m (Kokhu) to 1,500 m (between Vistan and Dachti-Mazar). Other localities revealed are Novak-Bolo, and Pagandoz, in the same area. Due to road construction, the habitats of the species in the mountains can be partly destroyed. The species was not found near Dachti-Mazar (1,700 m) and Guskef (1820 m). So, some localities, known in the past, seem to have now been lost. An additional locality with few specimens was observed on the left bank, on the territory of the Romit Reserve, above Kokhu, (being under conservation – я бы это убрала, если речь идёт о заповеднике). The species is part of petrophyton, together with *Campanula incanescens, Celtis caucasica, Pyrethrum parthenifolium, Onosma linczevskii, Prangos pabularia, Scutellaria megalodonta, Cotoneastr hissarica, Poterium polygamum, Carex bucharica, Lindelophia macrostyla, Parieteria judaica* and other species in rock fissures. In the observed populations there are both generative and vegetative plants, but generative ones were without fruits, due an extremely hot summer of 2013. The populations were situated on vertical open rocks only; the area of each such rock

estimated as 0.15-0.25 ha, the distance between plants, both vegetative and generative, is 0.6 -4 m; the total number of specimens on the right bank is 3,000 -5,000.
Proposed conservation status of the species is. VU (vulnerable) [A2c, B2a, b (i)]

Parasilaus asiaticus (Korovin) Pimenov

The species is an endemic of South Tajikistan and adjacent Afghanistan; it has been independently described twice from each country. Nomenclature of the species was discussed by Pimenov (1978), who proposed a combination, adopted here. Most localities in Tajikistan are situated in the basin of the middle Pjandzh River in Khatlon province: "Tajikistan, SE part of SE Tadjikistanian depression, near Sarygor village"; "The same locality, canyon Suleiman-dere";"The same locality, Kafirkash, detrit screes"; "Vicinity of Shuroabad, Tirei ridge, "Nikolaevski spusk" from Shuroabad to Chirmanjou"; "The same locality, S of Safidao-bolo, conglomerate slope, the belt of rosariums". Now two additional localities are known outside this narrow area: "Khatlon province, S extremity od Kuh-i Frush Mt., former village of Kala-i Kunja, screes", our collection of 2012; "Badachschan, valley of Obi-Khumbou River near Obi-Kharak mouth, rocky slopes, 38°32,09'N, 70°49,63'E, h=1680 m a.s.l.", a novelty for Badachschan flora, revealed during the 2013 expedition. The populations in two last localities are rather small. On the contrary, the populations in Shuroabad region are well-developed, and can be observed in all suitable habitats. They can be found on screes of conglomerate deluvium together with *Artemisia porrecta, Astracantha dissecta, Cousinia batalinii, C. leptacantha, C. fasciculatarsi, Dianthus darvasicus, Nepeta floccosa, Onobrychis laxiflora, Scariola orientalis*, whereas other slopes are covered by almond-trees (*Amygdalus bucharica*) and wormwood (*Artemisia*) communities. Such distribution of *P. asiaticus* populations was observed near Safidao-bolo village (37°51, 37'N, 70°05, 32'E, h= 2260 m), near Safidao-pojen along the new road from Shuroabad to Pjandzh valley, and, according to past observations, near the upper point of so called Nikolaevski spusk-. *P. asiaticus* grows in small groups of 20-30 plants with 10 - 205 cm among them (average 80 cm). The area of each population varies from 5 to 150 m². The total number of plants can be estimated from 10,000 to 100,000.
So, the species can be classified as VU (vulnerable) [A4, B1a]

Seseli rimosum Pimenov

The species was described by a participant of the present project (Pimenov, 1976), and has been collected sometimes lower in the valley of Obichingou River ("Tajikistan, the southern slope of the Peter I Range, valley of the Obichingou River, in rock fissures near Punjekwa village. 18.06.1973; 24.07.1974; 14.07.1976" and "Tajikistan, S slope of the Peter I Range, valley of the Obichingou River, below Kaftarguzar village, in rock fissures, 22.06.1990"). In 2013 the species was found in one locality on the Obichingou River ("Right bank of the Obichingou River, above Damgob village, rocks of S exposition, 38°47.41'N, 70°14, 16'E, h=1480 m a.s.l. 29.07.2013). The plants, growing together with *S. rimosum*, are *Ziziphora pamiroalaica, Tunica stricta, Poterium polygamum, Pseudohandelia umbellifera, Polygonum paronichyoides, Leptunis trichodes, Carex bucharica* and so on. Unitary rare plants of *S. rimosum* occupy the total area under 0.35 ha; the overall number of individuals of different age groups being 300-420. Near Punjekwa village the populations of *S. rimosum* were not discovered, what demonstrates?? Population dynamics along the Obichingou River, and the vulnerable status of the species, endemic to this valley only. Although an old collection it is known

from Karategin ridge, Konjaz River, near from mouth of Khanako River, Popov, Stepanenko, 27.07.1963.
Proposed status of *S. rimosum* – EN (endangered) [A1a, B1a, c; 2 c (iii)]

Seseli sclerophyllum Korovin

The species was described (Korovin, 1975) on the basis of two gatherings from Darwaz Mts., made in neighboring localities. The type locality is"Ad declivitatem australem jugi Darvasici, in valle fl. Obi-Charok, 09.07.1962, *N.G.Popov, Stepanenko & Statzkji 1222"* (holotype TAD!). The second collection was made in 1969 ("S slope of the Darwaz ridge, the basin of the Obi-Khumbou River, Dudargi Canyon (at the foot of the Khaburabad pass), detrit-stony slope, h= 1,700 m. 22.08.1969. Chukavina, Kinzikaeva & Rjabkova 2970" (TAD).Both localities are situated along the old main road from Dushanbe to Badachschan. Although any botanists, including us, collected various plants there later (especially when compiling "Flora of Tajik SSR"), *S. sclerophyllum* was no longer to be found. In 2013 we again carefully examined all rocks and screes between Khaburabad pass and Kalai-Khumb, but in vain. This allows to suggest that the species has disappeared in its type locality, or at least its population has considerably declined. *S. sclerophyllum* is a chasmophyte, and such populations are notoriously sensitive to habitat destruction.
Although it would be too early to qualify the species as "extinct in nature - EW" (the search of its populations should be continues), its qualification as CR (critically endangered) [A1a, c; B1b (i, iv)] seems to be justified.

As a result, the studied species can be arranged according the conservation groups:
CR: *Seseli sclerophyllum, Hyalolaena melanorrhiza, Aulacospermum ikonnikovii*.
These species must be under especially strong conservation control
EN: *Seseli rimosum, Ferula decurrens*
VU: *Galagania gracilis, Kafirnigania hissarica, Ferula kosopoljanskyi, Parasilaus asiaticus*
NT: *Cephalopodum badachschanicum*

The obtained data and species qualifications will be forwarded to Tajik National Committee for Nature Conservation for their inclusion to "Red Data Book of Tajikistan".

We hope to elaborate in near future additional proposals for local authorities for conservation of rare and endemic Umbelliferae species in Tajikistan.