LIFE ON LAND

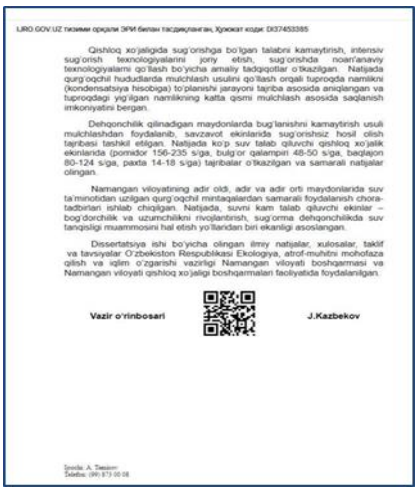
NAMANGAN STATE UNIVERSITY

Ta’lim orqali er ekotizmlarini qo‘llab – quvvatlash, Harakatlar orqali er ekotizmlarini qo‘llab – quvvatlash, Yerga ziyon keltiruvchi chiqindilarni yo‘q qilish choralari doirasida amalga oshirilgan ishlar bo‘yicha ma’lumot:

Namangan davlat universitetida 2022-yilda Ta’lim orqali er ekotizmlarini qo‘llab – quvvatlash, Harakatlar orqali er ekotizmlarini qo‘llab – quvvatlash, Yerga ziyon keltiruvchi chiqindilarni yo‘q qilish choralari va mavjud ekologik muammolarni bartaraf etish va zamon talablaridan kelib chiqqan holda takomillashtirish, ta’lim oluvchilarning e’tiborini umumbashariy ekologik muammolarga qaratish orqali ularning ona tabiatning qayta tiklanmas manbalarini saqlab qolish va ulardan oqilona foydalanish bo‘yicha mas’uliyatini kuchaytirish hamda ekologik ta’limning samarali shakllari va usullarini ishlab chiqish hamda joriy etish bo‘yicha bir qator amaliy ishlar o‘tkazilib kelinmoqda.

Quyida soha doirasida qilingan ishlar keltirib o‘tilgan:

1. Namangan davlat universiteti Tabiiy fanlar fakulteti Ekologiya va iqlimshunoslik kafedrasi tadqiqotchisi S.T.Abdurahmanov tomonidan qurg‘oqchilikda sug‘orishsiz (tuproq va xavo namligi hisobiga) oziq-ovqat maxsulotlarini ekologik toza holatda etkazish imkoniyatlari ishlab chiqilgan. Mazkur tadqiqot ishi natijalari respublikaning qurg‘oqchil mintaqalarida amaliyotga joriy etilgan.



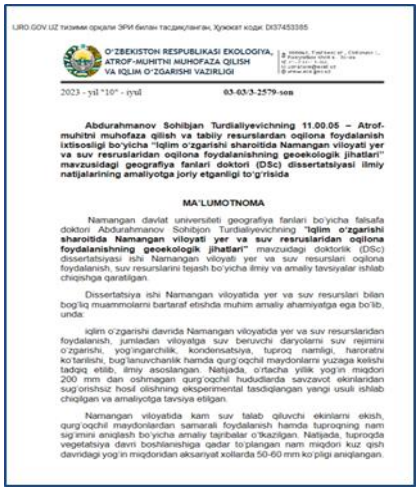
Qishloq xo‘jaligida sug‘orishga bo‘lgan talabni kamaytirish, intensiv sug‘orish texnologiyalarini joriy etish, sug‘orishda noan’anaviy texnologiyalarni qo‘llash bo‘yicha amaliy tadqiqotlar o‘tkazilgan. Natijada qurg‘oqchil hududlarda mulchlash usulini qo‘llash orqali tuproqda namlikni (kondensatsiya hisobiga) to‘planishi jarayoni tajriba asosida aniqlangan va tuproqdagi yig‘ilgan namlikning katta qismi mulchlash asosida saqlanish imkoniyatini bergan.

Dehqonchilik qilinadigan maydonlarda bug‘lanishni kamaytirish usuli mulchlashdan foydalanib, savzavot ekinlarida sug‘orishsiz hosil olish tajribasi tashkil etilgan. Natijada ko‘p suv talab qiluvchi qishloq xo‘jalik ekinlarida (pomidor 156-235 s/ga, bulg‘or qalampiri 48-50 s/ga, baqlajon 80-124 s/ga, paxta 14-18 s/ga) tajribalar o‘tkazilgan va samarali natijalar olingan.

Namangan viloyatining adir oldi, adir va adir orti maydonlarida suv ta’minotidan uzilgan qurg‘oqchil mintaqalardan samarali foydalanish chora-tadbirlari ishlab chiqilgan. Natijada, suvni kam talab qiluvchi ekinlar – bog‘dorchilik va uzumchilikni rivojlantirish, sug‘orma dehqonchilikda suv tanqisligi muammosini hal etish yo‘llaridan biri ekanligi asoslangan.

Dissertatsiya ishi bo‘yicha olingan ilmiy natijalar, xulosalar, taklif va tavsiyalar O‘zbekiston Respublikasi Ekologiya, atrof-muhitni mohofaza qilish va iqlim o‘zgarishi vazirligi Namangan viloyati boshqarmasi va Namangan viloyati qishloq xo‘jaligi boshqarmalari faoliyatida foydalanilgan.

Vazir o‘rinbosari J.Kazbekov



O‘ZBEKISTON RESPUBLIKASI EKOLOGIYA, ATROF-MUHITNI MUHOFAZA QILISH VA IQLIM O‘ZGARISHI VAZIRLIGI

2023 - yil "10" - iyul 03-03/3-2579-son

Abdurahmanov Sohibjan Turdialiyevichning 11.00.05 – Atrof-muhitni muhofaza qilish va tabiiy resurslardan oqilona foydalanish ixtisosligi bo‘yicha "Iqlim o‘zgarishi sharoitida Namangan viloyati yer va suv resruslaridan oqilona foydalanishning geoekologik jihatlari" mavzusidagi geografiya fanlari doktori (DSc) dissertatsiyasi ilmiy natijalarining amaliyotga joriy etganligi to‘g‘risida

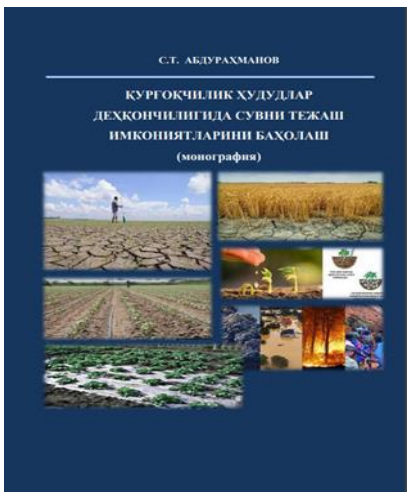
MA`LUMOTNOMA

Namangan davlat universiteti geografiya fanlari bo‘yicha falsafa doktori Abdurahmanov Sohibjon Turdialiyevichning **"Iqlim o‘zgarishi sharoitida Namangan viloyati yer va suv resruslaridan oqilona foydalanishning geoekologik jihatlari"** mavzusidagi doktorlik (DSc) dissertatsiyasi ishi Namangan viloyati yer va suv resurslari oqilona foydalanish, suv resurslarini tejash bo‘yicha ilmiy va amaliy tavsiyalar ishlab chiqishga qaratilgan.

Dissertatsiya ishi Namangan viloyatida yer va suv resurslari bilan bog‘liq muammolarni bartaraf etishda muhim amaliy ahamiyatga ega bo‘lib, unda:

iqlim o‘zgarishi davrida Namangan viloyatida yer va suv resurslaridan foydalanish, jumladan viloyatga suv beruvchi daryolarni suv rejimini o‘zgarishi, yog‘ingarchilik, kondensatsiya, tuproq namligi, haroratni ko‘tarilishi, bug‘lanuvchanlik hamda qurg‘oqchil maydonlarni yuzaga kelishi tadqiq etilib, ilmiy asoslangan. Natijada, o‘rtacha yillik yog‘in miqdori 200 mm dan oshmagan qurg‘oqchil hududlarda savzavot ekinlaridan sug‘orishsiz hosil olishning eksperimental tasdiqlangan yangi usuli ishlab chiqilgan va amaliyotga tavsiya etilgan.

Namangan viloyatida kam suv talab qiluvchi ekinlarni ekish, qurg‘oqchil maydonlardan samarali foydalanish hamda tuproqning nam sig‘imini aniqlash bo‘yicha amaliy tajribalar o‘tkazilgan. Natijada, tuproqda vegetatsiya davri boshlanishiga qadar to‘plangan nam miqdori kuz qish davridagi yog‘in miqdoridan aksariyat xollarda 50-60 mm ko‘pligi aniqlangan.

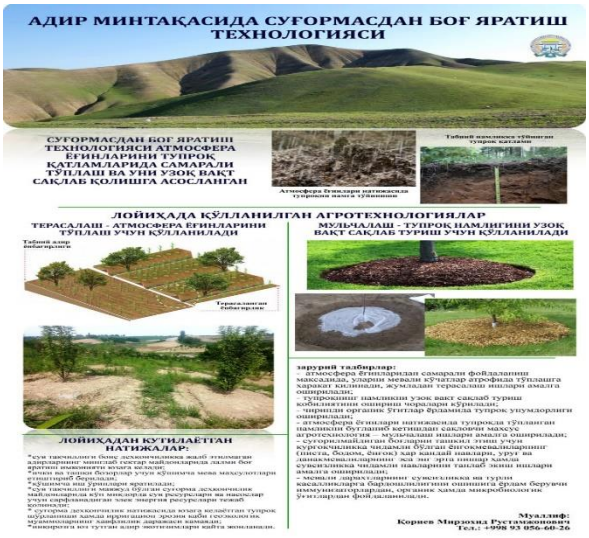


С.Т. АБДУРАХМАНОВ

ҚУРҒОҚЧИЛИК ҲУДУДЛАР ДЕҲҚОНЧИЛИГИДА СУВНИ ТЕЖАШ ИМКОНИЯТЛАРИНИ БАҲОЛАШ

(монография)

2. O’zbekistonda oziq-ovqat xavfsizligini ta’minlash maqsadida Namangan davlat universiteti Ekologitya va iqlimshunoslik kafedrasida qurg’oqchil adir hududlaridan samarali foydalanib lalmi bog’ tashkil etish va meva mahsulotlari etishtirish bo’yicha tajriba sinov ishlari amalga oshirildi.



Link: https://www.youtube.com/watch?v=FUMskGnb9B0

3. Markaziy Osiyoda jumladan O‘zbekistonda tarqalgan yovvoyi lolalarni muhofaza qilish va ular tarqalgan hududlarni himoya qilish maqsadida «Central Asian Tulip Workshop IUCN Red Listing and regional strategy» (10-13 May, 2022 yil) tadbirda Namangan davlat universiteti Biotexnologiya fakulteti dekani D.Dexqonov (D. Dekhkonov) ishtirok etgan (tadbir dasturi ilova qilinadi).

Региональная встреча по диким тюльпанам Средней Азии

Включение видов в Красную книгу МСОП и разработка региональной стратегии сохранения диких тюльпанов

10 – 13 Мая, 2022

Park Hotel

Бишкек, Кыргызстан

Программа

День 1 – 10 Мая, 2022 (Тренинг)

Время	Сессии и содержание семинара
08:45	**Регистрация участников**
09:00	*Сессия 1:* **Приветствие и знакомство с участниками** • **Приветственное слово от организаторов встречи** (проф. Шалпыков К.Т.) • **Приветствие и знакомство с МСОП** (Katharine Davies, BGCI) • **Цели, программа и содержание семинара** • **Знакомство с участниками**
	Сессия 2: **От первичных данных к Красной книге: Введение в процесс оценки в Красную книгу МСОП и роль оценщика** • **Презентация: Введение в Красный список угрожаемых видов МСОП** • **Презентация: От первичных данных до Красной книги процесс оценки Красного списка и роль оценщика**
	Сессия 3: **Ключевые термины и понятия, используемые в критериях Красной книги** • **Презентация: Термины, используемые в критериях Красной книги МСОП**
10:50	**Кофе-Брейк** (10 минут)
11:00	*Сессия 3 (продолжение)* • **Подведение итогов: Термины, используемые в критериях Красной книги МСОП**
	Сессия 4: **Категории Красной книги** • **Презентация: Категории Красной книги МСОП** • **Презентация: Качество данных и неопределенности**
	Сессия 5: **Критерий А** • **Презентация: Критерий А**
12:00	**Обед** (45 минут)
12:45	*Сессия 6:* **Критерий Б** • **Презентация: Критерий Б**

	Сессия 7: Критерии B, Г и Д • Презентация: Критерии B, Г и Д
	Сессия 8: Оценка для Красной книги: Тематическое исследование • Упражнение: Применение критериев Красной книги МСОП - тематическое исследование
15:00	Кофе-Брейк (15 минут)
15:15	*Сессия 8:* Проведение оценки для включения в Красную книгу • Презентация: Пример оценки тюльпанов для включения в Красную книгу • Практика: Совместная оценка тюльпанов для включения в Красную книгу
17:30	Конец дня

Дни 2 и 3 – 11/12 Мая 2022 (Включение тюльпанов в Красную книгу)

Время	Сессии
08:45	Регистрация участников
09:00	*Сессия 1* **Включение тюльпанов в Красную книгу**
10:50	Кофе-Брейк (10 минут)
11:00	*Сессия 2* **Включение тюльпанов в Красную книгу**
12:00	Обед (45 минут)
12:45	*Сессия 3* **Включение тюльпанов в Красную книгу**
15:00	Кофе-Брейк (15 минут)
15:15	*Сессия 4* **Включение тюльпанов в Красную книгу**
17:30	Конец дня

День 4 – 13 Мая 2022 (Разработка стратегии сохранения тюльпанов)

Время	Сессии
08:45	**Регистрация участников**
09:00-09:15	Презентация – Бретт Вилсон Рассматриваемые приоритетные территории и критерии
09:15-09:45	Групповая работа по странам, определение приоритетных участков для сохранения на основе критериев
09:45-10:25	Презентация групп о приоритетных участков для сохранения и обоснование (по 10 минут на страну)
10:25-11:25	Приоритетные территории для сохранения на региональном уровне
10:50	**Кофе-Брейк** (10 минут)
11:25-12:00	Презентация целей и задач и обсуждение. Вопросы и ответы
12:00	**Обед** (45 минут)
12:45-12:55	Энерджайзер
12:55-13:30	Ранжирование целей и задач
13:30-15:00	Групповая работа по обсуждению конкретных действий по целям в приоритетных участках
15:00	**Кофе-Брейк** (15 минут)
15:15-16:15	Презентация групп по конкретным действиям для каждой цели
16:15-17:30	Резюмирование действий и формализация (Создание рабочей группы по тюльпанам на региональном уровне? Соглашения по сохранению тюльпанов на на региональном уровне)
17:30	**Конец дня**

День 5- 14 Мая 2022 (Полевой выезд)

08:00-15:00. Полевой выезд в пилотный участок Шамшы, Токмок

Список участников семинара

№	ФИО	Страна	Участие
1	Кутманова Д.А. (по согласованию)	Кыргызстан	Оффлайн
2	Шалпыков К.Т.	Кыргызстан	Оффлайн
3	Лазьков Г.А	Кыргызстан	Оффлайн
4	Ганыбаева М	Кыргызстан	Оффлайн
5	Усупбаев А.К.	Кыргызстан	Оффлайн
6	Ситбаева Г.Т.	Казахстан	Оффлайн
7	Иващенко А.А.	Казахстан	Оффлайн
8	Эпиктетов В.Г.	Казахстан	Оффлайн
9	Дехконов Д. Б.	Узбекистан	Оффлайн
10	Бешко Н.Ю	Узбекистан	Оффлайн
11	Наврузшоев Д.Н.	Таджикистан	Онлайн
12	Бобоев М.	Таджикистан	Онлайн
13	Туракулов И.	Таджикистан	Онлайн
14	Гуламадшоев У.	Таджикистан	Онлайн
15	Christenhusz M.	Великобритание	Оффлайн
16	Gill D.	Великобритание	Оффлайн
17	Brockington S.	Великобритание	Оффлайн
18	Wilson B.	Великобритание	Оффлайн
19	Davies K.	Великобритание	Оффлайн
20	Саманчина Ж.Б.	Кыргызстан	Оффлайн
21	Султангазиев О.Э	Кыргызстан	Оффлайн
22	Кабаева А.М.	Кыргызстан	Оффлайн
23	Тагаев Б.А.	Кыргызстан	Оффлайн
24	Чернявская М.В.	Кыргызстан	Оффлайн
25	Бекенова Ж.	Кыргызстан	Оффлайн

4. 2023-yilning 12-13-may kunlari Samarqand davlat universitetida “Zamonaviy geografik tadqiqotlar: nazariya, amaliyot, innovatsiya” mavzusida xalqaro ilmiy-amaliy konferensiya o’tkazildi. Xalqaro konferensiyada NamDU katta o’qituvchisi, g.f.f.d. Mirzahmedov Ismoiljon Karimjon *o’g’li "Farg’ona vodiysi landshaftlaridan foydalanish va ularni muhofaza qilishning boshqarish muammolari"* mavzusi bilan ishtirok etdi.
Link: https://www.samdu.uz/uz/news/43417

5. 2022 yilning 23-aprel – 3 may kunlari Farg’ona viloyati tabiatiga dala ekspeditsiyasi uyushtirildi, u erda Farg’ona viloyati Ekologiya va atrof-muhitni muxofaza qilish boshqarmasi boshlig’i B.Eshonov, NamDU tadqiqotchilari I.Soliyev, I.Mirzaxmedovlar Yozyavon cho’lining bioxilma-xilligi, So’x daryosining o’zgarishi, viloyatning tuproqlarini sho’rlanishi va unga ta’sir etuvchi omillarning o’rganish bo’yicha tahliliy va amaliy tadqiqotlar olib borildi.
Link: https://t.me/ecofarghana

Plant Diversity of Central Asia

PDCA ISSN 2181-240
PDCA ISSN 2181-239

What determines the distribution of *Tulipa* species in Uzbekistan?

Temur Asatulloev[1], Davron Dekhkonov[1,2], Komiljon Sh. Tojibaev[1*]

[1]*Institute of Botany of Academy of Sciences of Uzbekistan, 100125, Tashkent, Uzbekistan*
[2]*Namangan State University, 107161, Namangan, Uzbekistan*

✉ ktojibaev@mail.ru

ABSTRACT

Although the distribution of *Tulipa* species in Uzbekistan is well documented, there is no clear understanding of the importance of three classes of environmental variables, climate, soil type, and topography, as determinants of their distribution. We mapped the richness of *Tulipa* species in Uzbekistan, and conducted species distribution modeling to analyze the contribution of climate, soil type, and topography, to their predicted suitable ranges. The relationship between *Tulipa* species richness and altitude is best described by a hump-shaped curve, with a majority of the *Tulipa* species occurring at the altitude range of 700-2200 m. The climate was a major determinant of species distribution for the majority of the analyzed species, however, topography (slope angle and aspect) was equally or even more important for *T. tschimganica*, *T. borszczowii*, *T. butkovii*, *T. carinata*, *T. affinis*, *T. micheliana*, *T. sogdiana* and *T. korolkowii*. Soil was an important factor only for *T. uzbekistanica*, *T. butkovii* and *T. lanata*. The conservation implications of these results are discussed.

Key words: geospatial analysis, species richness, species range, species distribution modeling

Introduction

Tulips (*Tulipa* spp.) are among the most popular ornamental plants. Wild *Tulipa* species, due to the attractivity of their flowers and importance for breeding, have always been among the top priority conservation targets. Tulips appear in Red Lists of virtually all countries where they occur (Baitulin 2014; Khassanov 2019; Nowak et al. 2020; SAEPF et al. 2006).

Mountainous Central Asia is a recognized hotspot and center of diversity for the wild tulips (Botschantzeva 1962; Eker et al. 2014). To date, over 80 species are distributed in this region (Dekhkonov et al. 2022; WCVP 2022). Among the Central Asian countries, Uzbekistan is particularly rich in *Tulipa* species. Tojibaev & Beshko (2014) listed 34 *Tulipa* species as occurring in Uzbekistan, with six taxa being endemic to the country. The distribution of *Tulipa* species in Uzbekistan is well documented, however, there is no clear understanding of the importance of three classes of environmental variables, climate, soil type, and topography, in their distribution. Knowledge of the role of these factors as determinants of the *Tulipa* species range has very important practical implications. Tulips have always been high-priority species for conservation, and the conservation of *Tulipa* species both ex situ and in situ critically depends on this knowledge. For example, if topography (e.g. a particular slope angle and aspect) plays a critical role for a species, the necessary microenvironmental conditions for its living collection will hardly be possible to create in a botanical garden. On the contrary, if soil is the major determinant of a species range, creation of a particular soil microhabitat in a botanical garden will be a much easier task. For

http://doi.org/10.54981/PCDA/vol1_iss2/a5
Received: 20 August 2022; Accepted: 21 September 2022 Academic editor: Ismail Eker
Plant Diversity of Central Asia 2 (2022): 129–137

6. 2022-yilda Namangan davlat universiteti Biologiya kafedrasi yer ustki ekotizimlarini, xususan o‘rmonlar va quruq yerlarni saqlash, tiklash va ulardan barqaror foydalanish bo‘yicha Nizomi ishlab chiqilgan. Ushbu Nizom Namangan viloyati tabiiy landshaft maydonlarining yer ustki ekotizimlarini, xususan quruq yerlarni saqlash, tiklash va ulardan barqaror foydalanish, alohida ahamiyatga ega hududlarda tarqalgan bioxilma-xillik vakillarini tadqiq etish, flora va faunasining turlar ro‘yhatini shakllantirish va davlat tabiat yodgorliklari (keyingi o‘rinlarda - muhofaza etiladigan tabiiy hududlar)ning qo‘riqlanma zonalarini belgilash hamda rejimini o‘rnatish bilan bog‘liq munosabatlarni Namangan viloyati ekologiya va atorof-muhitni muhofaza hududiy boshqarmalari bilan birgalikda tartibga soladi. Asos: Vazirlar Mahkamasining 2021 yil 5 maydagi 282-son qarorini 5-Ilovasi.

Link: https://t.me/c/1337772859/9410

7. 2022 yilning 23-aprel – 3 may kunlari Farg’ona viloyati tabiatiga dala ekspeditsiyasi uyushtirildi, u yerda Farg’ona viloyati Ekologiya va atrof-muhitni muxofaza qilish boshqarmasi boshlig’i B.Eshonov, NamDU tadqiqotchilari I.Soliyev, I.Mirzaxmedovlar Yozyavon cho’lining bioxilma-xilligi, So’x daryosining o’zgarishi, viloyatning tuproqlarini sho’rlanishi va unga ta’sir etuvchi omillarning o’rganish bo’yicha tahliliy va amaliy tadqiqotlar olib borildi.

Link: https://t.me/ecofarghana

8. D.Dexqonov Markaziy Osiyoda taqalgan 64 ta tur, shu jumladan O‘zbekistonda tarqalgan 24 ta lola turlarini Xalqaro Tabiatni muhofaza qilish tashkilotining Yo‘qolib ketayotgan turlarining qizil ro‘yhatiga kiritishda ishtirok etgan.

Link: https://www.iucnredlist.org/search?query=Tulipa&searchType=species

9. Tuproqshunoslik va Agrokimyo ilmiy tadqiqot instituti bilan hamkorlikda yer ekotizimlarini saqlash jumladan, Namangan, Navoiy va Farg’ona viloyatlari tuproqlaridan samarali foydalanish va ularni muhofaza qilish masalalari, shu bilan birga voha tuproqlarini saqlashga qaratilgan ilmiy amaliy loyihasi bajarildi.

Link: https://www.agro.uz/tuproqshunoslik-va-agrokimyo-ilmiy-tadqiqot-instituti/

10. Namangan davlat universiteti Biologiya kafedrasida 2022 yil dekabr oylarida suv sifati standartlari va suvdan foydalanish bo'yicha ko'rsatmalarga egaligi (ekotizimlarni, yovvoyi tabiatni, inson salomatligi va farovonligini himoya qilish uchun suv sifatini ta'minlash bo`yicha o`z rejasini ishlab chiqdi, Bunga ko`ra, kafedrada mutaxassislar tomonidan suv havzalari ekotizmlari, suv hayvonlari, ularni tarkibiy qismlarini saqlab qolish va ularga alohida e`tibor berish bo`yicha o`z takliflarini kiritdi.

Link: https://t.me/c/1409170845/17436

in situ conservation, knowledge of what environmental factor(s) determine the species range is vital in planning translocations, and in nature reserve decision-making (Volis 2022; Volis & Blecher 2022). Despite the importance of analysis of *Tulipa* species distribution, there have been only very limited attempts to understand the environmental requirements of the *Tulipa* species and the causes of their rarity (Dekhkonov et al. 2021; Wilson et al. 2021). The goal of this paper was two-fold: (i) to map the *Tulipa* species richness in Uzbekistan, and (ii) to understand the factors determining the distribution of *Tulipa* species in Uzbekistan.

Materials and Methods

Study area

The study area is Uzbekistan located in Central Asia between latitudes 37° and 46° N and longitudes 56° and 74° E. Approximately 12% of the country's total area are mountains and foothills and the rest of the territory is plains (Kuchkarov et al. 2018). Main mountainous regions are situated in the north-eastern (Ugam, Chatkal, Kurama, Fergana ranges), south-eastern (Turkestan and Alay), and southern (Hissar, Zeravshan, Babatag ranges) parts of the country. The climate is continental. The average summer temperature is around +40°C, while the average winter temperature is around −23°C (Baratov et al. 2002).

Data acquisition

We collected the herbarium specimens of 33 *Tulipa* species (34 taxa) from 2014 to 2021 at altitudes ranging from 50 to 3650 m, from mid-March to the end of July. Some areas were examined several times to ensure proper coverage. We took GPS coordinates and recorded the plant habitat and blooming time for each collected specimen. The 1300 collected specimens were deposited in National Herbarium of Uzbekistan (TASH). The other sources of the data used in this study were the previously published data (Botschantzeva 1962; Khasanov 2019; Tojibaev & Kadirov 2010), herbarium sheets stored in TASH, LE and MW (Thiers 2019), and also information from Global Biodiversity Information Facility (GBIF 2022) and Plantarium (2022). The species were identified according to (Zonneveld 2009) and (Tojibaev & Beshko 2014), and cross-checked by the World Checklist of Selected Plant Families (WCSP 2022) and Plants of the World (POWO 2022). Overall, more than 3500 specimens were examined.

Geospatial analysis and species distribution modeling

The species occurrence data were uploaded into ArcGIS 10.8 and used to create the species richness map. For all species we calculated area of occupancy (AOO) and extent of occurrence (EOO) in GeoCAT according to the guidelines of IUCN (2012). The elevation ranges were assessed based on geographic coordinates by GPS visualizer (https://www.gpsvisualizer.com). The information on AOO, EOO, elevation range and number of known populations for each species was visualized by creating radar charts in the fmsb package (Nakazawa 2019) in R. The importance of climate, topography, and soil in the *Tulipa* species distribution (except for *T. bactriana* which has a single occurrence record) was analyzed using the rJava package (Urbanek & Urbanek 2017) in R. This package performs species distribution modeling and calculates, using the permutation, a percentage contribution of each of the environmental variables in the final model. For climate, we used the 19 'Bioclim' variables from WorldClim v.1.4 (Hijmans et al. 2005) with a resolution of 30″ latitude/longitude (~1 km^2 at the ground level). For soil, we downloaded from the FAO website (https://www.fao.org/soils-portal/data-hub/soil-maps-and-databases/faounesco-soil-map-of-the-world/en/) the Digital Soil Map of the World. After extraction, the Uzbekistan soil map had 15 soil type categories. The elevation map downloaded from WorldClim v.1.4 was used to

make slope and aspect maps. For the latter we utilized "slope" and "aspect" functions in ArcToolbox as implemented in ArcGIS v10.8 (Pawluszek et al. 2019). The slope map was produced using "percent_rise" classification. The resulting slope map had five categories (flat: 0-3%, very undulating: 3-10%, undulating: 10-20%, slightly steep: 20-32%, steep: >32%), and the aspect map had 9 categories (flat, north, northeast, east, southeast, south, southwest, west, northwest).

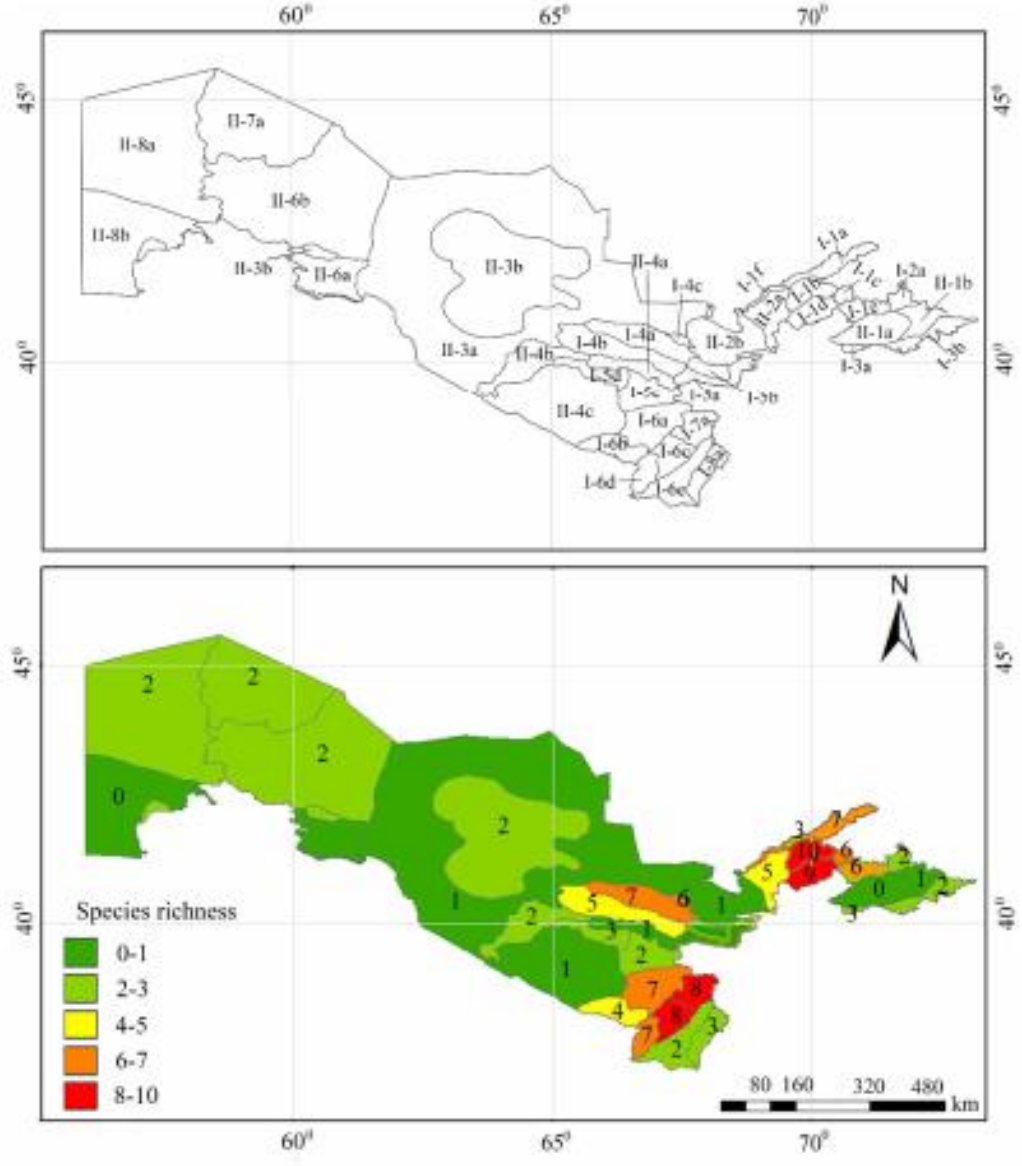


Fig. 1. Phytogeographical division of Uzbekistan according to Tojibaev et al. (2016) (top) and the *Tulipa* species richness map (below).

1. 2022 yil Namangan davlat universiteti etakchi tashkilot sifatida mahalliy va jamoalar uchun ekotizimlar bo‘yicha “Farg‘ona vodiysi shimoliy adirlari florasining muhofazasi” nomli dasturiy tavsiyanoma tayyorlangan va Namangan viloyati Ekologiya va atrof-muhit muhofaza qilish hududiy boshqarmasiga keng foydalanish uchun topshirilgan.
Link: https://uznature.uz/yz

2. Andijon davlat universiteti tabiiy fanlar fakulteti, Geografiya kafedrasida "Hududlarning landashft ekologik holatini baholash va optimallashtirish, demografik jarayonlar rivojlanishi va ijtimoiy infrastruktural tizimini takomillashtirish" mavzusidagi ilmiy-amaliy seminar bo’lib o’tdi.

Seminarda NamDU o’qituvchisi Alimdjanov Nozimjon Nimadjonovich "Yer resurslarining landshaft-ekologik holatini baholash va uni takomillashtirish yo’llari (Namangan viloyati misolida) mavzusi bilan ishtirok etdilar.
Link: https://adu.uz/uz/news/article/1637

3. Tuproqshunoslik va Agrokimyo ilmiy tadqiqot instituti bilan hamkorlikda er ekotizimlarini saqlash jumladan, Namangan, Navoiy va Farg’ona viloyatlari tuproqlaridan samarali foydalanish va ularni muhofaza qilish masalalari, shu bilan birga voha tuproqlarini saqlashga qaratilgan ilmiy amaliy loyihasi bajarildi.
Link: https://www.agro.uz/tuproqshunoslik-va-agrokimyo-ilmiy-tadqiqot-instituti/