

MONGOLIAN JERBIL /*MERIONES UNGUICULATUS*/' SPREAD DEPENDING ON ABIOTIC FACTORS

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ABSTRACT

Mongolian gerbil *Meriones unguiculatus* only exists in the central part of Asia, such as the steppes of our country, Russia's Natural Territory, Dauria steppe, north east desert regions of China, steppe, forest steppe, and dryland areas. The rodent is known for favoring to live in areas with sandy soils and has nutritious fruits and leguminous plants.

97.6% of the total territory of Mongolia or 117626.7 thousand hectares are used for grazing purposes and the spread of the Mongolian gerbil *Meriones unguiculatus* largely due to pasture degradation. The plants in the forest steppe area have high biomass and extensive damage to the crop area can indicate that it is capable of adapting to any ecosystem. In the event of an overwhelming increase in population, it affects people's interests and other living things and becomes "harmful". According to our study, the distribution of Mongolian gerbil *Meriones unguiculatus* is recorded to be active in 19 states of our country. The distribution of Mongolian gerbil *Meriones unguiculatus*, which can be harmful when over-populated in the pastures, hay and crop fields, is dependent on abiotic factors. An area map developed according to abiotic factors.

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INTRODUCTION

97.6% of the total territory of Mongolia which could also be said 117626.7 thousand hectares is used for grazing purposes and Mongolian gerbil *Meriones unguiculatus* prevalence is largely due to pasture degradation. Forest vegetation biomass is high, and can cause a lot of damage to the crop area, which can indicate that it is adaptable to any ecosystem condition. About 50 percent of Mongolia's mammals, 70 species of mammals in Mongolia are rodenticides, and are often associated with genetically modified herbivores. These animals are abundant for the nature but they are over-populated therefore they become the main competitor of other herbivores. Therefore, it becomes a "harmful" adverse impact on human activities and other animals in the event of an overwhelming increase in population. At present, Mongolian gerbil *Meriones unguiculatus* distribution has been recorded in 19 provinces of Mongolia. In recent years, increasing levels of harmonization is affecting the economy, so further research on the prevalence, harms and predictions of this species is needed. That is why we aimed to develop a biological mapping of distribution of Mongolian populations that are dependent on abiotic factors.

MATERIALS AND METHOD

In the spring and autumn season, we researched the distribution and morphology measurements and made GPS

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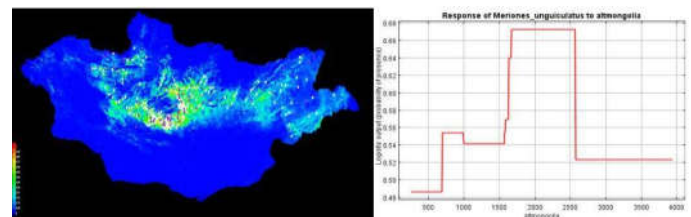
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coordinates of the observation points using Maxent and ARCGIS10.2.2. The research consisted of covering 19 provinces' pastureland and crop fields.

RESEARCH RESULT

Design and distribution of the proposed distribution model

The research consisted of covering 19 provinces' pastureland and crop fields.

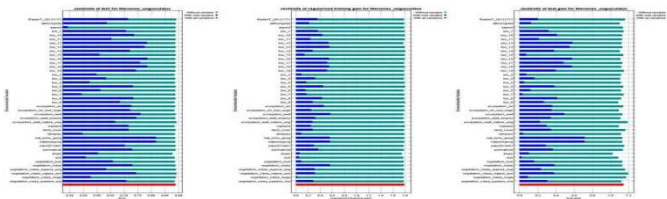


Picture 1

According to habitat modeling, Mongolian meriones unguiculatus is mostly populated at KhangaiKhentii Mountain Range, Great Lakes Valley, Eastern Mongolia at 750-2500 m above sea level. The population is way lower in areas with lower than 750 m above sea level and the height of the altitude exceeds 2500 meters (Picture1).

The boundary of this distribution is associated with weather factors and zones, and we have developed a list of meteorological stations near the site. The habitat Maxent modeling creates the most practical and practical habitat model for the species using the most basic and basic environmental layers of data for the species distribution.

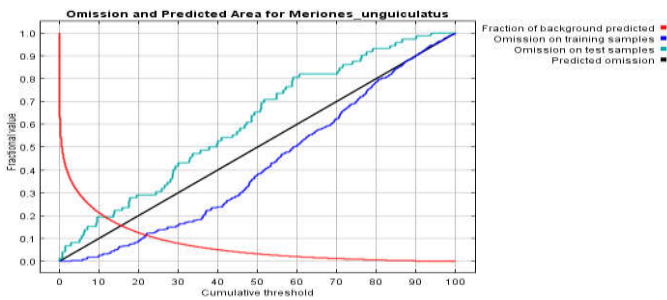
Test results for Jackknife hypothesis to examine the attributes of Maxent modeling layers



Picture 2

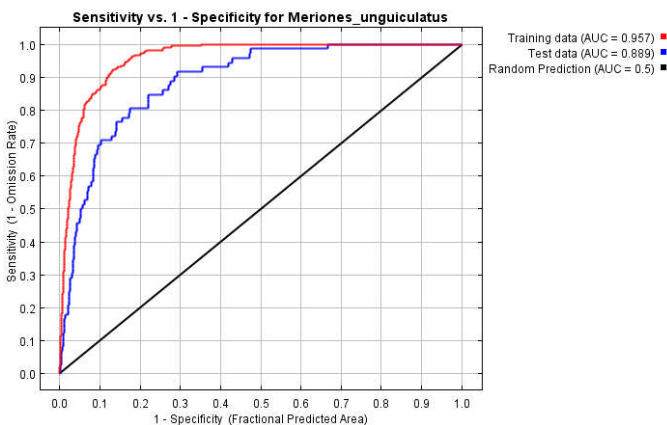
Description

The light blue color represents the bottom of a non-variable curve. (AUC value is not used for any indicator). The dark blue color values shown in the left are showing the meaning of used AUC method model. Red represents a complete model of the AUC, which includes all the indicators (Figure 2). The most influential factor in the development of pattern distribution of Mongolian gerbil *Meriones unguiculatus* are (NATIONAL ZONE GOE GRAPHY) Natural zones, (BIO-18 Heat seasonal precipitation), (BIO-12 Annual precipitation), (BIO-16 Wet seasonal precipitation), (BIO-13 Wet weather precipitation), (BIO-17 Dry Seasonal Precipitation), (BIO-19th Quarterly Precipitation), as shown above.



Picture 3

The following figure shows the extent of the area of 750-2500 meter above sea level area and Mongolian gerbil *Meriones unguiculatus* distribution in the field is represented by a threshold function. The samples used in the research, samples, and given data were used to make the graph. The area that is likely to be scattered is similar to the result of our research can be seen by the light and dark blue lines.



Picture 4

From the picture above, our data used in our study can be useful for processing, so that our modeling and research findings can be scientifically feasible. The data collected by

our survey data is $1 < 0.889$ and the probability of the MBR function is $1 < 0.957$. (Picture 4)

Further Opinion

The Mongolian *meriones unguiculatus* is mentioned in many books. In the book, <<The mammal species of the People's Republic of Mongolia>> written by S.Dulamtseren, D.Tsendjaw, and D.Abirmed, note that this species has its epidemic, breeding stage, arm, habitat and chromosome composition in Mongolia.

Some indicators of small rodent morphometries and scientists of the Russian Federation А.Г Банников, <<Млекопитающие монгольской народной республики>>. Москва 1954, И.М Громов, and <<Млекопитающие фауны СССР>>. Москва, Ленинград 1963. In these books, Meriones kind of rodents are recorded with great details.

Also, the Mongolian Red List of Mammals contains international assessments and regional assessments, threats, global and regional distributions and protected status.

D. Tsewgmid, and D. Tsendjaw's << Mammals of Mongolia>> describe some of the effects of this species on morphometric characteristics, how it spread in Mongolia, the activity of living, the dominant vegetation, and the grassland grazing. Mongolian *meriones unguiculatus* is common in all steppe and gobi desert zones. Orkhon, Selenge valley, and their tributaries penetrate the forest steppe into large rivers. It is abundant in Stipa-Wild leek grassland, gobi's plant, and so close in river valleys.

CONCLUSION

1. The distribution of Mongolian gerbil *Meriones unguiculatus* is likely to spread through steppe and forest steppe areas of Mongolia, ranging from 750-2,500 meters above sea level.
2. Distribution of Mongolian gerbil *Meriones unguiculatus* dependent to the nature area, annual precipitation, heat season precipitation, wet season precipitation, wet weather precipitation, dry season precipitation, and cold season precipitation.
3. The distribution of Mongolian gerbil *Meriones unguiculatus* inversely related to the slope and surface area of the surface.
4. The distribution and diffusion of Mongolian gerbil *Meriones unguiculatus* vary greatly depending on the abiotic factors, which vary in the western, central and eastern regions of Mongolia.

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References

1. А.Г. Банников., Млекопитающие монгольской народной республики., Москва 1954 он., 407-415.,
2. В.Е. Соколов., В.Н Орлов., Определитель млекопитающих Монгольской Народной Республики ., Москва 1980 он., 159-160.,
3. Buyandelger S., TsMunkhzul, R. P. Reading and J. D. Murdoch. 2009. Small animal body measurements and

- density in the semi-desert of IkhNart Nature Reserve, Dornogobi, Mongolia. 2004-2009 report to the Denver Zoo Wildlife of the Mongolian Steppe program of Denver Zoo.
4. Д. Цэвэгмид, Д. Цэнджав, Монгол орны хөхтөн амьтан, Улаанбаатар 1988 он
 5. Доржготов, Д. 2003. Монгол орны хөрс. ШУА-ийн Газарзүйн хүрээлэн. УБ.,
 6. И.М. Громов, А.А. Гуреев, Г.А.Новиков, И.И.Соколов, П.П.Стрелков, К.К.Чапский, Млекопитающие фауны СССР, Москва, Ленинград 1963 он.,
 7. Murdoch, J. D., Munkhzul, Ts, Amgalanbaatar, S, Reading, P. R. 2006. Checklist of Mammals in IkhNart Nature Reserve. *Mongolian Journal of Biological Sciences*. 4(2): 69-74x.
 8. Н.Батсайхан, Р.Самъяа, С.Шар, С.П.Б. Кинг, Монгол орны хөхтөн амьтад таних гарын авлага.,
 9. Рыдинг, Р., Кенни, Д., Вингард, Г., Мандах, Б., Штайнхйуэр-Буркат, Б. 2006. Их Нартын Байгалийн нөөц газар.
 10. С. Дуламцэрэн, Д. Цэнджав, Д. Авирмэд, БНМАУ-ын амьтаны аймаг хөхтөн амьтан, Улаанбаатар 1989 он.,
 11. С. Дуламцэрэн, Монгол орны хөхтөн амьтан тодорхойлох бичиг, Улаанбаатар 1970 он.,
 12. Цэнджав, Д., Сүхчулуун Г., Жамсран, Сүрэн Д., Төмөрбаатар И. 2004. Дорноговь аймгийн биологийн баялаг. ШУА Биологийн хүрээлэн, Дорноговь Аймгийн Байгаль Орчны Алба.
 13. Цэгмид, Ш. 1969. Монгол орны физик газарзүй. ШУА., Газарзүй-Цэвдэг Судлалын Хүрээлэн. УБ.,
 14. Emma L. Clark, Жавзансүрэнгийн Мөнхбат, Монгол орны хөхтөн амьтны Улаан данс.,
 15. www.Egerbil.com
 16. www.Jstor.org
 17. www.google.com
 18. http://www.science.smith.edu/departments/Biology/VH_AYSEN/msi/pdf/i0076-3519-503-01-0001.pdf.
 19. www.Amazon.com

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