Ecology and Population Status of Long Eared Hedgehog

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Abstract: In August 2019, we conducted a comprehensive scientific investigation of Long Eared Hedgehogs in an area near Hongyashan Reservoir in Minqin County, Gansu Province, China, using line transects, visiting survey and observation of feeding. At the same time, combined with relevant data, the living habits and protection status of Long Eared Hedgehog in this area were studied. Long Eared Hedgehogs are the only type of hedgehog found in desert and semi-desert areas. The species was included in the List of Land Wildlife under State Protection that is Beneficial or of Important Economic or Scientific Value released by the State Forestry Administration on August 1, 2000. It has now become a protected species. Protecting Long Eared Hedgehog, for maintaining the ecological balance of desert and semi-desert grasslands, promoting harmony between human and nature, maintaining biodiversity, promoting the comprehensive, sustainable and coordinated development of the economy and society, is of great significance.

1. Introduction

The Long Eared Hedgehog (Hemiechinus auratus Gmelin, 1770), also known as Ci Tuan, Ci Zhu, or Ci Shu in Chinese, is easily identified by having ears that protrude beyond its thorns. Hemiechinus is a relatively primitive mammal that belongs to the family Erinaceidae Fischer von Waldheim, 1817 within the order Insectivora Illiger, 1811[1]. Hemiechinus auratus was first discovered by Gmelin in Kazakhstan in 1970[2]. In 1951 Ellerman et al. divided Asia's Long Eared Hedgehog into 16 subspecies[2]. In 2003, Wang Yingxiang et al. proposed that China's domestic species should be further divided into two subspecies, namely H. auritus auritus distributed in Xinjiang and northwest Gansu, and H. auritus alaschenicus distributed in Inner Mongolia, northern Shanxi and Ningxia[2]. The study aims to gain an insight into the ecological habits and population characteristics of Syrtis major to enhance conservation management and proliferation research to enhance biodiversity conservation in the area.

2. Morphological Characteristics

Hemiechinus auratus weigh 280–500 g, have a body length of 170–220 mm, a tail length of 24–34 mm, and a cranial length of 50–56 mm in general. They are typical small hedgehogs[3]. But the ears of Hemiechinus auratu are very large, which length 37–56 mm, higher than the surrounding spines which are invariably white. The end of each ear is blunt and rounded somewhat exaggerating the proportion of the ears. Thus it is called the Long Eared Hedgehog. Fumining et al.[4] pointed out that in some reports Mesechinus dauricus is also called the “Long Eared Hedgehog” because the two species are very similar. In Mesechinus dauricuses, however, the ears are only slightly longer than the surrounding spines which are not white. Compared with other species, the Long Eared Hedgehogs’ limbs are longer and it moves more quickly. Their mouth is small, which in profile it looks like a mouse. The spines covering the dorsal part of the body from the back of the ear to the base of the tail are up to 35 mm long, and arranged in multiple rings. From the base to the cusp, the nodes are dark brown, white, or dark brown and white, and a few of the spines are all white. The spines on the top of the head do not divide to the left and right, instead of interconnecting. The sides

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of the body side and the abdomen are covered with short soft gray hairs. The head is orange, the ears are grayish yellow, the sides of the body are grayish yellow, the abdomen is grayish white. Long Eared Hedgehogs prefer a dark environments and are nocturnal. They do not have very strong vision or hearing, but their sense of smell is very sensitive. When playing or foraging for food they rely on their sense of smell to identify natural enemies and predators. They are also inherently timid and in the presence of natural enemies, the body, head, feet and small tail will be drawn into a ball with their spines erect in order to protect themselves. They can also use their spines to attack their enemy. The natural enemies of Long Eared Hedgehogs include harrier, owl, weasel, wild cat, and fox.

3. Distribution and Habits

The Long Eared Hedgehog is distributed in Afghanistan, China, Cyprus, Egypt, Iran, Iraq, Israel, Kyrgyzstan, Lebanon, Libya, Mongolia, Pakistan, Russia, Syria, Tajikistan, Turkey, Turkmenistan, Ukraine and Uzbekistan. Within China it is confined to the northwest region (Xinjiang, Inner Mongolia, Shaanxi, Gansu and Ningxia). Aksai County is mainly distributed in the desert region of the front mountains[5]. Its preferred habitats are lowland arid and semi-arid grasslands and deserts or semi-deserts where they live in thickets. Such habitats are characterized by water shortage, drought, desertification, salinization of vegetation. The vegetation types of habitats are all desert vegetation, with sparse vegetation, monotonous species and low coverage. Nevertheless, due to regional, geomorphic, soil, season, climate and other differences, plant species and richness are not uniform[6].

Long Eared Hedghogs feed on small animals such as lizards, toads, small rodents, mole crickets and various beetles as well as succulent plant foods such as cyclamate [7]. In order to find food, they can walk a distance of 9 km in one night. Based on laboratory experiments, we have shown that Long Eared Hedgehog will also feed on mealworms, animal viscera, lean animal meat, watermelon, tomatoes, bananas, corn, and bread but do not eat green pepper, sorghum, or beans. In feeding situations, when food is scarce, small weak Long Eared Hedgehogs are harassed by stronger ones.

Long Eared Hedgehogs reach sexual maturity at the age of about four months. They breed in the spring and summer, and have a gestation period of 29-36 days[8]. They typically breed 1-2 times a year in caves, and 3-6 young were born by a single female per year[4]. Pups are born with sparse soft spines, but the length of the spines triples in five hours, and after two weeks they have full body hard spines. In nature, when the average temperature is between 7.8 ℃ and 15 ℃, adult Long Eared Hedgehogs are either rarely active or enter the hibernation state[10]. During hibernation, the body temperature drops to 3-8 ℃[4].

4. Population and Protection Status

Our team captured the Long Eared Hedgehogs in an area near the Hongyashan reservoir, which is located in the northeast of the Hexi Corridor near the lower reaches of Shiyang River. This area is surrounded by the Tengger and the Badain Jaran deserts and a saline desert which is located in the Black mountain and the front valley of Hongyashanin, Minqin county, Gansu province. It is located about 30 km away from Minqin County. And it is a desert depression reservoir engineering and Asia's largest desert reservoir[11]. In the area where we made the survey, Long Eared Hedgehogs mainly inhabit sand dunes on which were growing Nitraria tangutorum and Achnatherum splendens.

Although widely distributed, Long Eared Hedgehogs are not well studied. Qin Weichun et al. has reported that the Long Eared Hedgehog is endangered[12]. Although it can be kept as a pet, there is a high risk of wild bacterial infection, and ticks are often parasitic on the body because they cannot be cleaned. Therefore Long Eared Hedgehogs should only be kept in captivity by licensed individuals for breeding purposes.

Long Eared Hedgehogs eat harmful insects and small rodents that might otherwise be a nuisance

to humans. As secondary consumers they plays an important role in maintaining the stability of its ecosystem function. In recent years, however, local people have killed large numbers of Long Eared Hedgehogs for food and to sell their skin, causing its population numbers to decrease[13]. It is suggested to control hunting and make rational use of this economic animal resource.

5. Conclusion

In China, the Long Eared Hedgehog has been included in the national protection of animals. As for the “China’s Three Protected Animals” law stipulates that it is illegal to capture one animal without authorization, while capturing more than 20 animals constitutes a crime, and capturing more than 50 animals is a major criminal case. The first requirement of life is survival. Every species has the right to guarantee its own survival. For every one of us, starting from ourselves, respecting life means respecting ourselves. Since novel Coronavirus broke out at the end of 2019, both China and the world have been faced with great trials and challenges. Most emerging infectious diseases or epidemics are caused by new or unknown pathogens of animal origin, especially in wild animals. In general, the interspecific transmission of new viruses from animal hosts makes the virus more capable of causing human infection, while the infection of a human easily leads to “human-to-human” transmission and disease outbreaks and pandemics[14]. Therefore, although the Chinese government's strong containment strategy has brought the epidemic under obvious control, the COVID-19 epidemic once again reminds us that it is imperative to strengthen the protection of the natural environment, maintain the ecological balance, and refrain from predatory exploitation of nature.

Therefore, while strengthening and improving the protection of animal diversity, the investigation of the status of wild animal resources and the sustainable use of wild animal resources, it can, to a certain extent, reduce the indiscriminate hunting and effectively reduce the occurrence of infectious diseases among wild animals.

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