



Coronaviruses Pandemic: Rescue and Release of the Confiscated Critically Endangered Chinese Pangolin (*Manis pentadactyla*) Continue in Nepal

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Abstract: Covid-19 pandemic lockdown started from 24 March 2020 in Nepal. The coronavirus found in pangolins and bats are said to be mostly resembling to Covid-19. However, conservation stakeholders and local community were involved in rescue and release of the confiscated Chinese pangolin during this pandemic. Information was collated through personal communication, self-involvement and media reports to assess the background of rescued and released pangolins, precautionary and impact of handling under this situation. Altogether, six Chinese pangolins were rescued from Province 1 (n=2), Province 3 (n=3) and Province 4 (n=1) in the month of May and June. Five individuals were confiscated from the area in the vicinity of homes whereas one was rescued from corn farm in Nepal-India border. Within 15-48 hours, the rescued pangolins were released back into the community forests. All rescued individuals were adult, male, estimated weighing of 3-5kg and 80-90cm in length. 84 persons including forest office staffs (15.5%), security personnel (22.6%), journalists (6.0%), members of community forest user groups (26.2%) and local community (29.8%) were involved in rescuing, transforming and releasing. However, 22 persons (26.2%) handled the pangolins properly and taking safety precautions such as wore masks, gloves and washed their hands before and after handling. Others 62 person (73.8%) who were involved in rescue and release without taking safety precautions also did not show any symptoms of Covid-19, in 14 days and more after their contact with pangolins. Most of the participants (95.2%) were still positive towards pangolins conservation in post-Covid and accepted that the precautionary measures were required to protect from zoonotic diseases. Therefore, it is necessary to increase the level of awareness amongst local community, CFUG members, security personnels and forest office staffs on zoonotic disease, their transmission and impact for the protection of animal and people.

Keywords: Covid-19, Chinese Pangolin, Conservation Stakeholders, Handling, Safety Precautions

1. Introduction

Nepal is part of the worldwide pandemic of covid-19 and the first case was reported on 23 January 2020. Government of Nepal ordered the lockdown from March 24 however the Covid cases was dramatically increased during May and June after people returned back from abroad. As of the date of

lockdown, 15 July 2020, there have been 17,061 confirmed cases of the coronavirus disease caused by the novel coronavirus (2019-nCov) with 38 deaths and 10,328 recovered [1]. It was found that SARS-CoV-2-related coronaviruses in Malayan pangolin (*Manis javanica*) seized in anti-smuggling operations in southern China and carry the strain of coronaviruses [2-3]. During the lockdown, traveling was restricted however, wildlife stakeholders continued the

rescuing wildlife including pangolins and seizing their body parts in different parts of the country. Division forest office is authority for legal procedure of wildlife rescue and release outside the protected areas. When the first responders (local people) confiscated the wild animals, they inform to either security agencies or Division/Sub-division forest offices (DFOs) nearer by them. There is no pangolin rescue and rehabilitation center in Nepal. Thus, DFOs decides for next step and they themselves collaborating with community forest user groups (CFUGs) release the rescued pangolins into safe natural habitat.

Chinese pangolin (*Manis pentadactyla*) is small-medium size mammal native to Asia [4] which is popularly known as *Salak* in Nepal [5]. This species is assessed globally as Critically Endangered [6] and nationally in Endangered [7]. It is also listed in the CITES Appendix I [8] and protected by the National Parks and Wildlife Conservation Act, 1973 [9]. Beside Nepal, the species occurs in Bangladesh, Bhutan, China, India, Myanmar, Taiwan, Thailand, and Vietnam. In Nepal, it is widely distributed, 24 districts mostly in the central and eastern parts [10].

Pangolins are the most heavily trafficked mammals in the world [11]. They are globally threatened due to illegal poaching and trade for their meat, scales and skin [12-13]. Many of the encounter pangolins certainly do not get noticed to the large community in world including Nepal. Since 2001, many incidents of pangolin confiscated have been occurring throughout the country. However, no study has been conducted on diseases, transmission and impact of improper handling. There also has not been assessed the precautionary measures during rescue, transfer and release of wildlife in the country. The covid-19 pandemic has threatened whole world and it has been reported that this virus might be originated from wildlife including pangolin. Therefore, this study assessed the background of confiscated pangolins, handling, transformation, safety measures and impact on those people who were involved in this activities during Covid-19 Pandemic.

2. Materials and Methods

Nepal is located between two large Asian Countries; China to the north and India to the south, east and west. The Great Himalayan ranges run along the entire northern region, providing a geographical barrier to China. The southern belt consists of plain lands known as the Tarai region and is a part of the Indo-Gangetic plains. The middle region consists of mountain ranges known as Mahabharat range and Siwalik range. Due to this elevation gradient from south to north, the country has diverse climatic conditions, ranging from tropical in the south to alpine in the north that supports diverse flora and fauna along with human socio-demographic where 126 ethnic groups speaking 125 languages [14]. The seven provinces of Nepal's structure, geographical location, area, population size, ethnic and linguistic are very diverse.

Nepal's climate is influenced by maritime and continental

factors, and has four distinct seasons. Spring (March to May), and is warm with rain showers, and temperatures around 22°C. Summer (June to August), is the monsoon season when the hills turn lush and green. Temperatures can get quite warm, up to 30°C. Autumn (September to November), is cool with clear skies. Temperatures are not too warm, with daily about 25°C and cool nights with minimum of 10°C. In winter (December to February), it is cold at night with temperatures sometimes below zero.

Data were collected through direct interview, phone and web communication with the people who were involved and stayed closed to pangolins during rescue, transfer and release under covid-19 lockdown. The participants were forest staffs, CFUGs members, journalists, security personnel and locals. A set of semi-structured simple and short questionnaire was prepared which last about 5-10 minutes. The questions included; location and time of rescue and release, pangolin background (species, gender, weight and length), handling, mode of transformation, safety measurements and health status of people. Media reports of May and June 2020 [15-16] were also reviewed for more information.

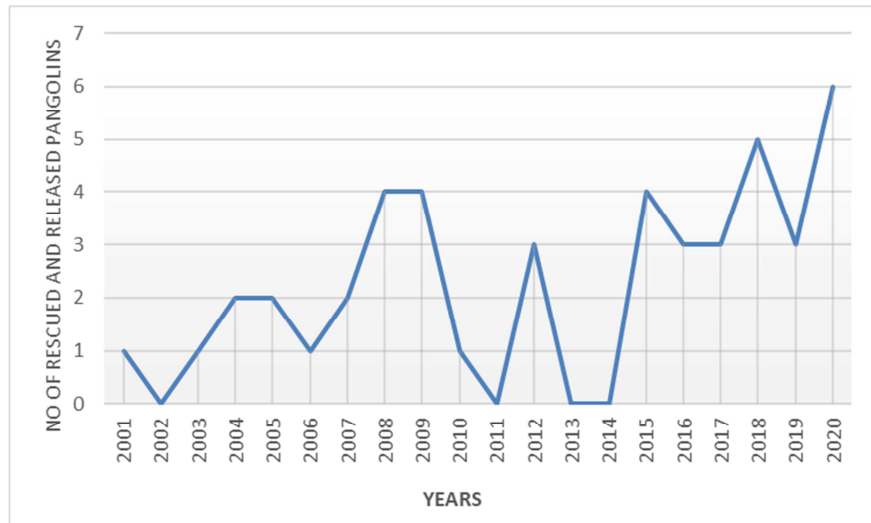
The first author got involved in one of the rescue and release of a Chinese pangolin in Bhaktapur District during lockdown of covid-19. She is involving in this activities and closely working with DFOs and community forest user groups, since 2008 till date.

All relevant information was also collected from record of DFOs, Police, CFUGs, Zoo and media reports. Two-decades data (from 2001 to June 2020) were accounted to show the status of rescue and released of Chinese pangolin in Nepal.

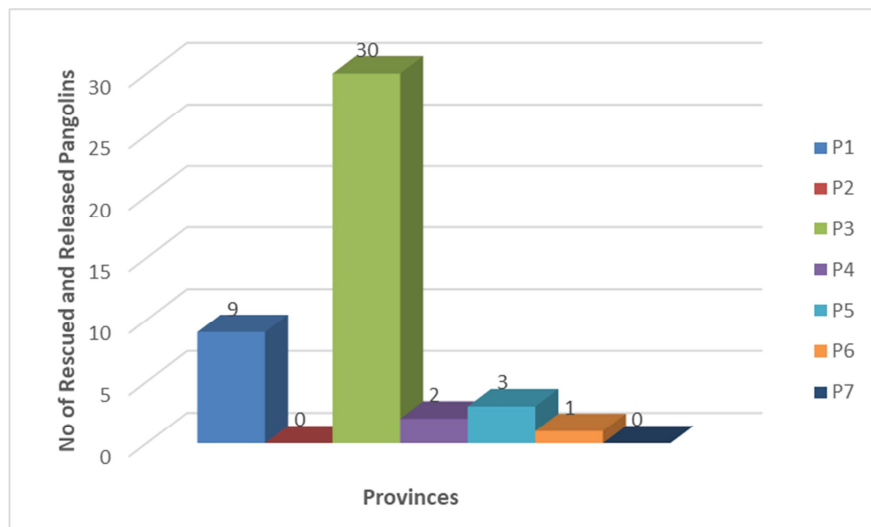
3. Results

Six individuals of Chinese pangolins were confiscated in the month of May and June under lockdown of coronavirus pandemic. They were rescued from Jhapa and Udhayapur Districts (Province 1), Dhading, Makwanpur, and Bhaktapur Districts (Province 3) and Gorkha District (Province 4) in Eastern, Central and Western parts of country respectively. Five of them were confiscated from the area in the vicinity of homes while one was rescued from corn farm in Nepal-India border. Also, 6.65 kg pangolin scales were also seized during this period.

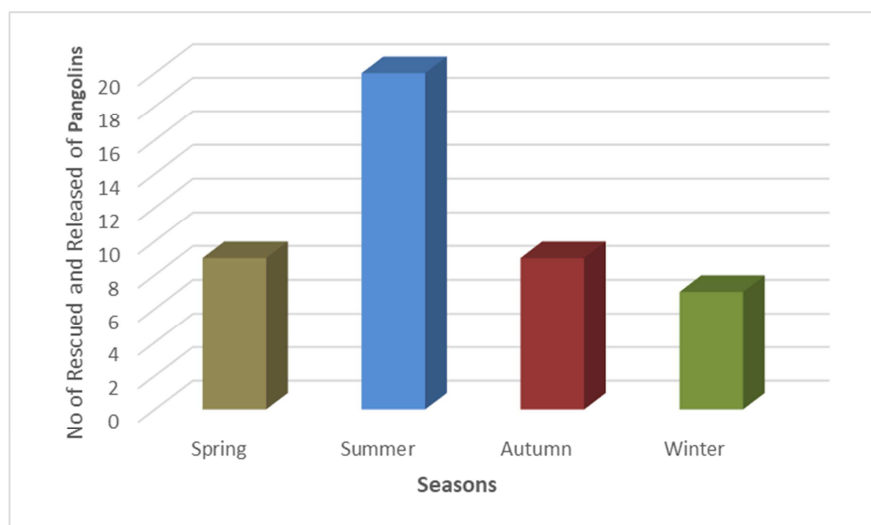
Total 84 persons including forest staffs (n=13, 15.5%), security personnel (n=19, 22.6%), journalists (n=5, 6.0%), members of community forest user groups (n=22, 26.2%) and local people (n=25, 29.8%) involved in rescuing, transforming and releasing of these pangolins. Some people (n=22, 26.2%) wore mask and gloves and also washed hands before and after handling whereas 62 persons (73.8%) were involved without precautionary measures. However, no one has found with symptoms of Covid-19 in 14days and more. All rescued pangolins were transferred from one place to another in rice bags by four wheels vehicle. Almost all involved people 95.2% (n=80) said that "yes" they should use precautionary measures for the protection from zoonotic diseases.



a)



b)



c)

Figure 1. Rescued and released Chinese pangolins in different a) years, b) provinces and c) seasons.

So far 45 Chinese pangolins have been rescued between 2001 to 30 June 2020 from different parts of country. There was increasing trend of rescued individuals, high in the years of 2018 and 2020 (Figure 1a). Most of pangolins (n=30, 68.2%) were rescued from province 3 in Central region (Figure 1b) and in summer seasons (n=19, 43.2%) (Figure 1c).

4. Discussion

The confiscated pangolins were used to transfer in Central Zoo before 2007 [17]. It has been reported that pangolins were not able to adapt and live in captive due to their specific unique dietary, burrowing habit and lack of resources to provide the basic environment. Therefore, frontline wildlife conservationists including first author initiated to release the rescued pangolins back into safe natural habitat for last 12 years. In Nepal, there was no practices of wearing personal protective equipment for wildlife handling even not wearing mask and gloves during rescue and release of pangolins. However, people who involved in rescue and release were not found with symptoms of covid-19 during this study. Possibilities that covid-19 can be transmitted to pangolins from the infected persons even they have cured as it repeats. So, the people involvement in rescue and release should be minimized and must be handle properly and other people should keep distance. Similarly, the pangolin trade was also continued during this situation. This pangolin trafficking increased the chances of zoonotic diseases transmission and spread of epizootic pathogens [18] because the viruses such as sendai virus and coronavirus has been found in trafficked Sunda pangolin in China [19-20] and a pestivirus and a coltivirus also reported in two dead Sunda and Chinese pangolins [18]. Therefore, extensive awareness programs should be conducted on these issues for long term conservation of pangolins.

For last few years back, people were more aware about the ecological important of pangolins and they became positive towards the species conservation in certain areas of Nepal. This positive attitude drives the local community to support in rescuing of pangolins and releasing them back into wild, safely. There is a hope of long term conservation of this globally threatened species in Nepal. In addition, most Chinese pangolins were confiscated, rescued and released in Province 3 because of previous pangolin conservation activities and capacity building programs conducted by conservation organizations which increased the awareness level of local communities. Similarly, this Province was found the most suitable habitat for this species as result of previous study [10]. Moreover, Summer is the monsoon season in Nepal and pangolins easily find food on the forest floor, especially ants. Therefore, more dispersing pangolins were confiscated in summer season as in Taiwan [21]. Although the risk of suffering infectious disease caused by Covid-19 is high only in cold season [22]. However, higher incidence of improper handling the rescued pangolins in summer might still need to take precautionary measurements

because there are other zoonotic diseases more prevalence in summer time, such as bacterial diseases, campylobacteriosis, salmonellosis and VTEC [23].

5. Conclusions

The study on diseases transmission through handling of pangolins is very crucial in the era of this Covid-19 pandemic. Although, we did not find any corona symptom in those people who were involved in rescuing, transforming and releasing of Chinese pangolins during this study. However, increasing awareness on these issues and safety measure should be initiated for pangolin and other wildlife conservation along with the protection of people.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no competing interests.

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