

PROMOTING SPECIES KNOWLEDGE: MAMMAL DIVERSITY AT RAGUNAN ZOO - A YOUTUBE VLOG EDUCATIONAL VIDEO

Fajar Adinugraha^{a*}, Dian Pirma Natasari Purba^a, Rinanda Priska Dalle^a, Jefrino Reis Pereira^a, Jhony Yakobus Lomo^a, Diana Insoraky Felasia Kmur^a, Rivaldi Sitinjak^a

^a Program Studi Pendidikan Biologi, FKIP-Universitas Kristen Indonesia, Kota Jakarta Timur, DKI Jakarta, Indonesia

*Corresponding author: Jl. Mayjen Sutoyo No. 2, Cawang, Jakarta Timur. E-mail: fadinugraha0608@gmail.com

Abstract

The lack of knowledge among students regarding animal species, particularly mammals, is a contributing factor to the loss of biodiversity. Therefore, it is essential to educate students about mammalia species through educational video. The aim of this research is to identify mammals in Ragunan Zoo for use as educational video content. The research methodology involved field exploration, followed by the creation of educational videos in the form of vlogs. Fifteen species were used as the subject of the learning videos about mammals. The species are classified into five orders: Artiodactyla (4 species), Carnivora (2 species), Primates (7 species), Proboscidea (1 species), and Rodentia (1 species). The learning videos are divided into two sections: non-primate group mammals <https://youtu.be/jonAd08pNQ4> and primate group mammals <https://youtu.be/iYNB9OpME4g?s>. The first video is 8 minutes and 20 seconds long and the second video is 9 minutes and 53 seconds long. These video can be use in the first step to introduce species diversity, especially mammals.

Keywords : Biodiversity, educational video, mammalia, Ragunan, vlog, YouTube

Introduction

Biodiversity on Earth is declining, as evidenced by the extinction of some species. The term 'biodiversity' most commonly refers to the number of species (Swingland, 2013). Biodiversity encompasses the diversity of life at the genetic, species, and ecosystem levels (FAO, 2019). Species extinction can be caused by inadequate knowledge and awareness of species, particularly among younger generations. Research by Fitri et al. (2021) shows the condition of students' low concept understanding of the characteristics of Kingdom Animalia. Generally, students lack understanding of vertebrate concepts (Agustin et al., 2020).

Knowledge of vertebrates, particularly mammals, is intricate and challenging. Mammalian diversity is still vast, both regionally and taxonomically (Schipper J et al., 2008). Misconceptions regarding animalia material can arise during learning (Jayanti & Susantini, 2021). Misconceptions may occur because students find it difficult to compare the characteristics, differences, similarities, and shapes of animals (Gultom, 2019). Yusriya et al. (2014), argue that using numerous scientific names in animal classification can hinder comprehension, which is particularly problematic for students in Indonesia, a country known

for its mega-biodiversity. According to Maryanto et al. (2019), there are approximately 773 species of mammals in Indonesia.

The low level of knowledge about mammalian species can be overcome by using educational videos as an alternative teaching tool. Educational videos use visualisation to explain material and be effective in teaching about mammalian species (Putri & Fadly, 2021; Setiawan et al., 2022). Yusriya et al. (2014) conducted research on animal classification, while Hidayah & Subarkah (2019) focused on 3-dimensional animation-based animal classification, both to teach students about species. However, the educational video developed did not specialize in mammals and did not incorporate real objects. Nadlah (2012) suggests that using media that integrates real objects (organisms) can improve learning outcomes.

Efforts have been made to explore zoos as a source of learning about animals. The results of this exploration have been developed into an educational video. Zoos can be used as a source of learning about animals (Hendriyani & Aurora, 2023; Nugraha & Amelia, 2022). The mammalian group of animals can be found at both Ragunan Zoo and Margawasatwa Park. Ragunan Zoo, which is a 147-hectare park, is home to over 2,000 specimens and more than 50,000 trees (Ragunan Zoo, 2024). The educational video takes the form of a vlog. A vlog, short for video blog, is a type of blog that uses video as its primary medium. Vloggers record events and moments from their personal or daily lives, typically lasting between 5 to 15 minutes (Liu, 2021).

This study aimed to identify the mammal species used in educational videos. These videos were then uploaded to YouTube to increase public awareness of mammal diversity. YouTube was selected due to its popularity among younger generations as a platform for self-expression and communication (Norðdahl et al., 2019). The importance of this research lies in promoting mammal diversity awareness among young people. Not all students have seen animals in person. Video can be a powerful teaching and learning tool, providing benefits through visual and auditory channels (Wu, 2016). Understanding mammal species is crucial in preventing the loss of biodiversity.

Methods

The research method employed is field exploration, or field work. Field exploration is used to observe behavior in natural conditions (Garcia & Sunderlin, 2011) by conducting research or data collection outdoors, outside of laboratories, libraries, and offices (Vero, 2021). Field exploration is labeled as qualitative (van de Ven & Poole, 2017). The field exploration of mammals was conducted at the Ragunan Zoo in Jakarta, located at Jl. Harsono RM. The location address is No. 1, Ragunan, Pasar Minggu, South Jakarta, 12550, Indonesia. The mammal observation team was divided into two groups: exploring mammals outside the Schmutzer Primate Center and inside.

The Schmutzer Primate Center focuses on primate mammals, while explorations outside the center are dedicated to non-primate mammals. This particular exploration was conducted on October 28, 2023, from 09:00 to 13:00 WIB, using observation of species along the visitors' path in the zoo and matching them with literature sources from journals or books using keywords of animal species. The data that matched were tabulated and analyzed qualitatively. Figure 1 presents the observation points for mammal exploration.

The data analysis was used to produce an educational video. The steps for creating such a video are: 1) establishing the objectives or desired outcomes; 2) gathering relevant materials or content; and 3) creating a storyboard to outline the visual and narrative structure of the video (Buchner, 2018). The videos were then presented for peer feedback. Additionally, the revised

videos were uploaded to YouTube. The description data for the instructional videos was qualitatively analyzed descriptively. Two videos were produced: one exploring non-primate mammals and another focusing on *Primates*.

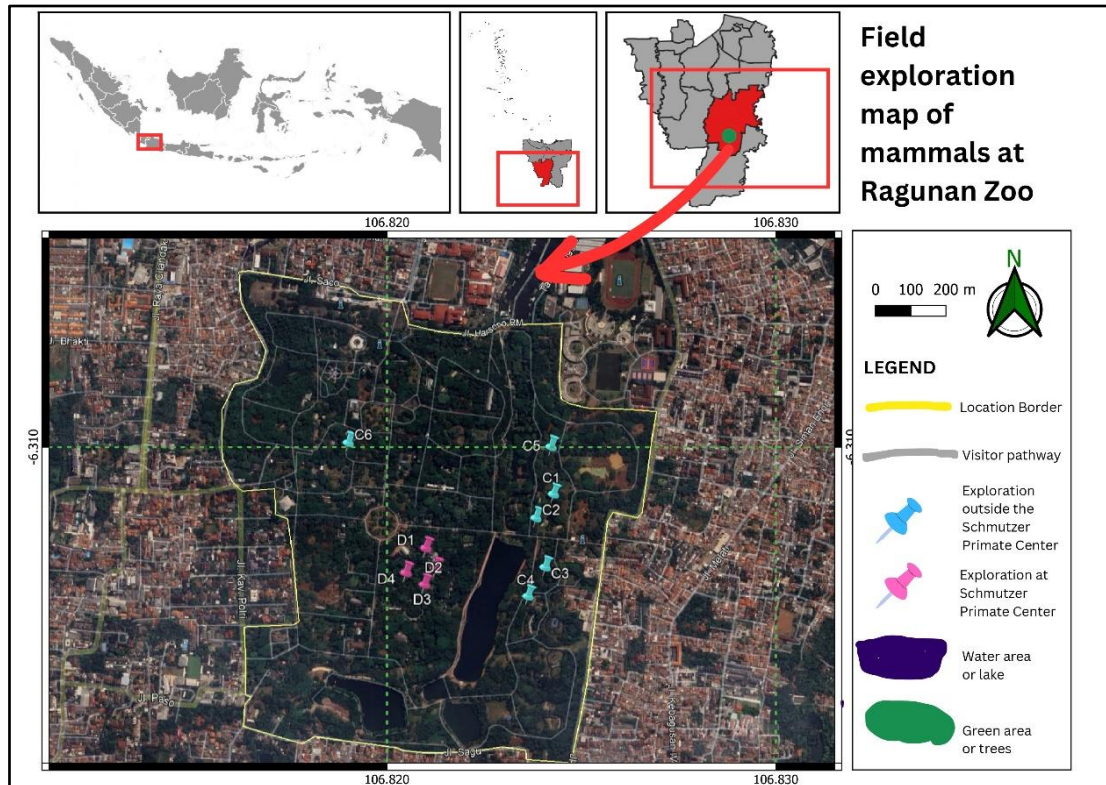


Figure 1. Map of mammal exploration locations at Ragunan Zoo

Results and discussion

The promotion of animals, especially mammals, must continue to support students' knowledge of biodiversity. Knowledge about mammals can be gained from zoos. The zoo is a complete place because it presents a variety of animals from different places. Zoos involve ex situ conservation. Wildlife species that are maintained and the purity of their species outside their natural habitat (Ministry of Environment and Forestry Indonesia, 2019). Ragunan Zoo, now called Ragunan Margasatwa Park, maintains various collections of live animals from different parts of Indonesia and other countries (Ragunan Zoo, 2024). Mammals are one of the groups of animals kept at Ragunan Zoo.

Mammals are part of the vertebrate phylum Chordata. Vertebrates are chordates, members of the Phylum Chordata (named after the notochord: Greek notos, "back"; chorde, "string") (Pough & Janis, 2019). Vertebrates are characterized by small to very large forms with pronounced cephalization, the brain enclosed in a skull, and the notochord partially or completely replaced by the spine (Lal, 2018). Most vertebrates have an endoskeleton made of cartilage or bone (Hickman et al., 2024). Vertebrates include fish (lamprey, fish), amphibians, reptiles, birds, and mammals (Rao, 2020; Slobodian et al., 2021). They can swim, crawl, walk, run, climb, glide, and fly (Linzey, 2016). This article is limited to the mammal group at Ragunan Zoo.

Most mammals can be recognized by the hair that covers part of their body, although some species have very few hair structures or cilia. Mammals originated in the Jurassic period, about 170 million years ago (Slobodian et al., 2021). Descended from synapsid reptiles, mammals are vertebrates with hair and mammary glands (Linzey, 2016). Mammals are monophyletic, as all mammalian lineages are derived from a reptilian ancestral taxon (Mayr, 1969). Mammals (ma-mā'lē-ə; L. mamma, breast) are one of the most biologically differentiated groups in the animal kingdom (Hickman et al., 2024).

Based on the survey, 15 species from the group Mammalia were observed. Mammals have a long list of characteristics not found in other organisms, such as the presence of mammary glands, a single bone in the lower jaw and a neocortex in the forebrain (Kemp, 2005). The 15 species belong to five orders: *Artiodactyla* (4 species), *Carnivora* (2 species), *Primates* (7 species), *Proboscidea* (1 species) and *Rodentia* (1 species). Data on mammalian species are presented in Table 2.

Table 2. Species of mammals used in the making of the video

No	Local name (in Indonesian Language)	Species	Genus	Family	Order
1	<i>Rusa Tutul</i>	<i>Axis axis</i> (Erxleben, 1777)	<i>Axis</i>	<i>Cervidae</i>	<i>Artiodactyla</i>
2	<i>Gajah Sumatra</i>	<i>Elephas maximus sumatranus</i> Temminck, 1847	<i>Elephas</i>	<i>Elephantidae</i>	<i>Proboscidea</i>
3	<i>Kapibara</i>	<i>Hydrochoerus hydrochaeris</i> (Linnaeus, 1766)	<i>Hydrochoerus</i>	<i>Caviidae</i>	<i>Rodentia</i>
4	<i>Beruang Hitam Amerika</i>	<i>Ursus americanus</i> (Pallas, 1780)	<i>Ursus</i>	<i>Ursidae</i>	<i>Carnivora</i>
5	<i>Unta Punuk Satu</i> (Arabian Camel)	<i>Camelus dromedarius</i>	<i>Camelus</i>	<i>Camelidae</i>	<i>Artiodactyla</i>
6	<i>Banteng</i>	<i>Bos javanicus</i> d'Alton, 1823	<i>Bos</i>	<i>Bovidae</i>	<i>Artiodactyla</i>
7	<i>Harimau Sumatra</i>	<i>Panthera tigris sondaica</i> Temminck, 1844	<i>Panthera</i>	<i>Felidae</i>	<i>Carnivora</i>
8	<i>Jerapah</i>	<i>Giraffa camelopardalis</i>	<i>Giraffa</i> Brisson, 1762	<i>Giraffidae</i>	<i>Artiodactyla</i>
9	<i>Simpai</i>	<i>Presbytis melalophos</i> (Raffles, 1821)	<i>Presbytis</i>	<i>Cercopithecidae</i>	<i>Primates</i>
10	<i>Owa Agilis</i>	<i>Hylobates agilis</i> F. Cuvier, 1821	<i>Hylobates</i>	<i>Hylobatidae</i>	<i>Primates</i>
11	<i>Monyet Dige</i>	<i>Macaca hecki</i> (Matschie, 1901)	<i>Macaca</i>	<i>Cercopithecidae</i>	<i>Primates</i>
12	<i>Owa Jawa</i>	<i>Hylobates moloch</i> (Audebert, 1798)	<i>Hylobates</i>	<i>Hylobatidae</i>	<i>Primates</i>
13	<i>Owa Bilau</i>	<i>Hylobates klossii</i> (Miller, 1903)	<i>Hylobates</i>	<i>Hylobatidae</i>	<i>Primates</i>
14	<i>Monyet Wulang</i>	<i>Macaca fascicularis</i> Raffles, 1821	<i>Macaca</i>	<i>Cercopithecidae</i>	<i>Primates</i>
15	<i>Lutung Jawa</i>	<i>Trachypithecus auratus</i> É. Geoffroy, 1812	<i>Trachypithecus</i>	<i>Cercopithecidae</i>	<i>Primates</i>

Table 2 shows that there are four species in the order *Artiodactyla*. The term *Artiodactyla* originated with Owen (1848), but the concept was first expressed informally by de Blainville (Jackson & Groves, 2015). Order *Artiodactyla* (är'tē-ō-dak'til-ə) (Gr. artios, even, + daktylos, toe): Even-toed hoofed mammals include pigs, camels, deer, giraffes, hippopotamuses, antelopes, cattle, sheep, and goats (Hickman et al., 2024). This order is often referred to as ungulates (Hickman et al., 2024) which are even-toed (either bipedal or quadrupedal) (Linzey, 2016; Pough & Janis, 2019). This group is found worldwide as primarily herbivores weighing 2-1400 kg (Hickman et al., 2024; Pough & Janis, 2019). Antlers or horns on the head; stomach with "4 compartments" (Lal, 2018). These ruminants quickly swallow large amounts of food before moving to a sheltered area, better protected from predators, to continue chewing (Francis, 2019).

Data in Table 2 show that there are two types of order *Carnivora*. Order *Carnivora* (car-niv'or-ə) (L. caro, flesh, + vorare, to devour): carnivorous mammals: dogs, wolves, cats, bears, weasels, seals, sea lions, and walruses (Hickman et al., 2024). Carnivores that have five toes with claws and canines as fangs (Lal, 2018). Animals that eat animal tissue (Linzey, 2016). Carnivores are divided into Caniformia (dog-like) and Feliformia (cat-like) (Pough & Janis, 2019). The order *Carnivora* consists of many omnivores, and some, such as the giant panda, are strict vegetarians (Hickman et al., 2024). Carnivores are a diverse group of mammals that, as the name suggests, have largely evolved with adaptations to hunt and kill vertebrate prey (Francis, 2019).

Based on observation in the Zoo, there are seven species in the order *Primates*. Order *Primates* (prī-ā'tēz or prī'māts) (L. prima, first): *Primates* (Hickman et al., 2024). All *Primates* have hands and feet that can grasp, toes that are generally hoofed rather than clawed, and eyes that are located at the front of the face (Francis, 2019). The first *Primates* were arboreal, living in forests in the early Cenozoic (Pough & Janis, 2019). The head rotates easily on the neck; the innermost toe and thumb are usually opposite (Lal, 2018). Examples are monkeys, apes, and humans (Hickman et al., 2024; Lal, 2018). First among animals in brain development, with a very large cerebral cortex (Hickman et al., 2024). Most species are arboreal, with large eyes, binocular vision, grasping hands, and five toes (usually with flattened nails) on the fore and hind limbs (Hickman et al., 2024). The majority of *Primates* live in the trees of tropical rainforests (Rosenberger, 2024).

Table 2 shows that there is one species in the order *Proboscidea*. Order *Proboscidea* (prō'bo-sid'ē-ə) (Gr. proboscis, elephant trunk, from pro, before, + boskein, to feed): elephants (Hickman et al., 2024). It is large in size, with a large head, wide and flat ears, a short neck and large body, columnar legs, and a long, flexible, muscular trunk with nostrils at the tip (Lal, 2018). One example is the elephant (Francis, 2019; Lal, 2018; Pough & Janis, 2019). Elephants have long been domesticated in Asia and used primarily for moving heavy loads, including timber in forestry, as well as for transport and even warfare (Francis, 2019). The largest living land animal, with two elongated tusk-like upper incisors and well-developed molars (Hickman et al., 2024). There are three extant species: Indian elephants, with relatively small ears, and two species of African elephants, with larger ears (Hickman et al., 2024).

Table 2 shows that there is one species from the order *Rodentia*. Order *Rodentia* (rō-den'tē-ə) (L. rodere, to gnaw): gnawing mammals: squirrels, rats, mice, marmots (Hickman et al., 2024). This order is a gnawing mammal; the incisors are chisel-like; there are no canines; and there is a gap between the incisors and the molars (Lal, 2018). Rodents can be recognized by their teeth, with large, curved, sharp incisors in the upper and lower jaws, no canines, and a wide diastema (toothless gap) in front of the cheek teeth (Francis, 2019). It can be characterized

by two pairs of chisel-like incisors that grow throughout life and are adapted for gnawing (Hickman et al., 2024). The number of mammal species per order is shown in Figure 2.

The observation data in Table 2 were used to create the educational video. It is divided into two sections: non-primate mammals and primate mammals. The video about non-primate mammals can be found at <https://youtu.be/jonAd08pNQ4> and it has 8 minutes and 20 seconds long. The video on primate mammals can be found at <https://youtu.be/iYNB9OpME4g?s>. The video is 9 minutes and 53 seconds long. It starts with an objective explanation of mammals, followed by a clear description of the classification and characteristics of the observed species. Figure 3 presents a screenshot from the video.

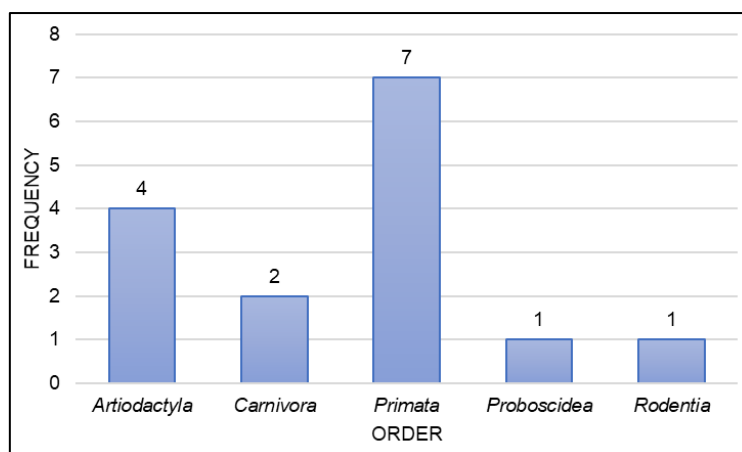


Figure 2. Number of mammal species used in the educational video

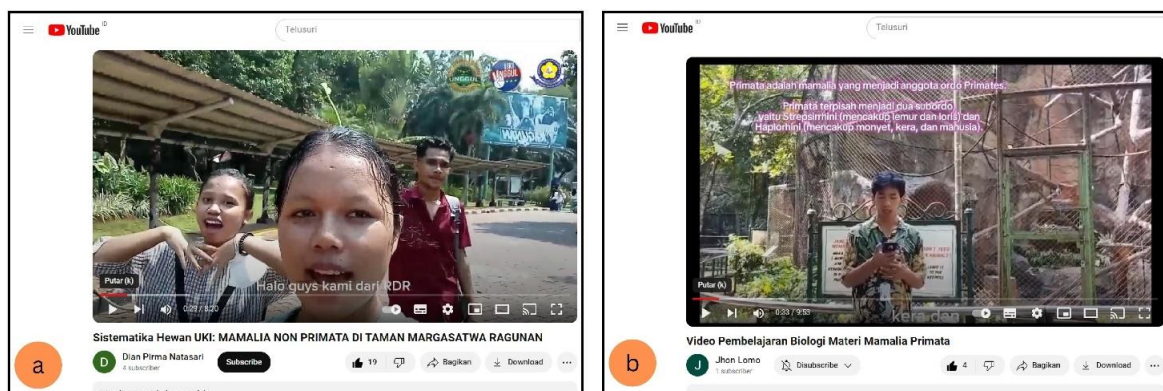


Figure 3. Screenshots of Mammalia group animal educational videos. (A) Non-primate group mammal video; (B) Primate group mammal video

Videos about mammals are presented in a vlog style combined with video, audio, images, and text to deliver informative content engagingly and emotionally. Vlogs are shared on YouTube and often include specialized visual elements such as editing, scoring, and subtitles. They can also serve as a promotional medium (Liu, 2021; Mandasari & Aminatun, 2020; Zhang, 2020). Vlog video is created to record and share human lives with others. The content of vlogs can range from daily life, travel, beauty, and more (Zhang, 2020). Vlogging has been incorporated into teaching to increase student engagement (Bueno et al., 2022).

Educational videos linked to YouTube media can improve vocabulary, including species names. Failure to understand vocabulary can create communication barriers, making it difficult for students to retain information (Dávila et al., 2021). Viewing images from dynamically generated videos and verbally explaining what was learned is highly beneficial for students (Fiorella et al., 2020). Vlog video is type of informational media that can serve as a valuable learning resource for students. They offer real-life experiences that can be accessed anytime through platforms such as YouTube (Theresia & Ratih Ayu, 2023). This video serves as an alternative for on-site learning (Adinugraha, 2022b). Figure 4 presents the mammal species featured in the vlog.

One limitation of this study is that the effectiveness of the educational video in increasing students' understanding of mammals is unknown since it has not been applied in learning. According to Wu (2016) article, although students enjoy the learning experience through watching videos, it is not always the most effective didactic format. When creating educational videos, it is important to incorporate 21st-century skills to encourage students to develop their abilities and share their experiences with others (Budiarti & Harlis, 2020). The study of animals can also be done with ethnozoology in the form of booklets (Andriliyani et al., 2021). Additionally, integrating different learning approaches can enhance the uniqueness of the video.

The learning approach needs to contain the principles of scientific process and student-centered learning to accommodate 21st-century education, namely the scientific approach (Adinugraha *et al.*, 2021), exploring the natural surroundings (Adinugraha, 2018), and incorporating local wisdom and culture (Adinugraha, 2022a; Adinugraha et al., 2021). Integrating indigenous knowledge with biology subjects through ethnobiological studies, such as ethnobotany, ethnozoology, and ethnoecology, has the potential to explore the local wisdom and culture approach (Adinugraha, 2022a). Further research can be suggested by studying animal utilization with culture and indigenous knowledge to help students understand the value of biodiversity. Understanding the value of biodiversity can foster awareness and prevent biodiversity loss.

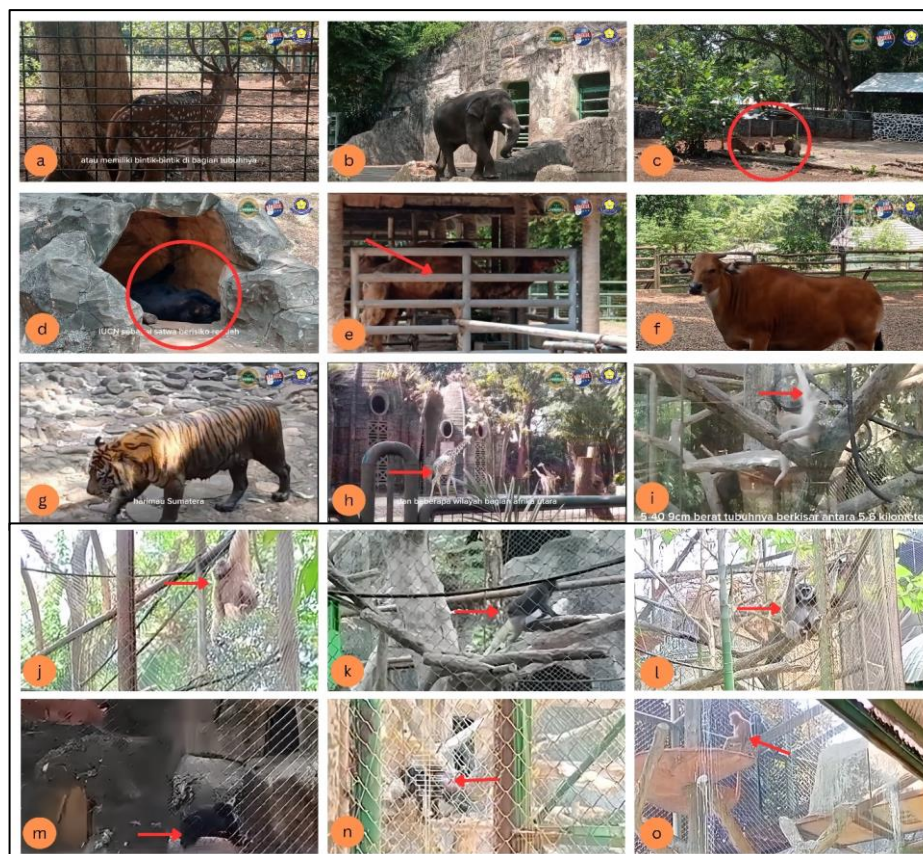


Figure 4. Screenshots of the Mammalia group animals used in the video. (A) *Rusa Tutul*; (B) *Gajah Sumatra*; (C) *Kapibara*; (D) *Beruang Hitam Amerika*; (E) *Unta Punuk Satu* (Arabian Camel); (F) *Banteng*; (G) *Harimau Sumatra*; (H) *Jerapah*; (I) *Simpai*; (J) *Owa Agilis*; (K) *Monyet Dige*; (L) *Owa Jawa*; (M) *Owa Bilau*; (N) *Monyet Wulang*; dan (O) *Lutung Jawa*

Conclusion

Exploration at Ragunan Zoo resulted in the identification of 15 mammal species, which were used to create educational videos. The species are classified into five orders: *Artiodactyla* (4 species), *Carnivora* (2 species), *Primates* (7 species), *Proboscidea* (1 species), and *Rodentia* (1 species). The educational videos are divided into two sections: non-primate group mammals and primate group mammals. The video on non-primate mammals can be found at <https://youtu.be/jonAd08pNQ4> with 8 minutes and 20 seconds long. The video on primate mammals can be found at <https://youtu.be/iYNB9OpME4g?s> with 9 minutes and 53 seconds long. The video starts by explaining what mammals are, followed by a discussion of the classification and characteristics of the species observed. Promoting knowledge of mammal species can help prevent biodiversity loss.

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