

A Survey and Taxonomic Study of Hemorrhois nummifer in Northwestern Syria: A Case Study from Idlib Governorate

Hanan Alkhalil 

Lecturer, Latakia University, Syria

Corresponding Author: e-mail: hanankk1988@gmail.com

Available online at: <https://doi.org/10.66422/RJMU.ID.81>

Received: 2 May 2026

Revised: 15 June 2026

Accepted: 19 July 2026

Abstract— In this study, we conducted a survey of Hemorrhois nummifer in various areas of Idlib Governorate, and its presence was documented during 2025-02026. Sites with diverse environmental conditions were selected such as forested areas. Agricultural land and mountainous areas with sparse vegetations and field surveys were conducted at a rate of two per month, with traps set in the evening and checked during the day. Information was provided on the environmental characteristics of the local sites where this species was documented, morphometric measurements and scale counts were taken, and the relationship between the distribution of this species and the species and the prevailing environmental factors in the study areas was examined. It was found to be abundant in forested areas with shrubby vegetation and rocky geology (Al-Laj- Jabal Al- Muzra, a) and was found in abundance in residential areas abandoned due to the war in several villages of Jabal al- Zawiya (Kafer Uwayed, Al-Bara). It was also frequently observed and documented in agricultural land in the Al- Habeet area and in the agricultural land of Saraqib, characterised by annual crops and red clay soil, as well as in the Jisr al- Shughur area with its humid climate (Al- Sukariya). This study indicates the expansion of the geographical range of this species across the entire province.

Keywords— Idlib Governorate, Hemorrhois nummifer, Taxonomy, Species.

Introduction

In our study, we dealt with the Hemorrhois nummifer, a non-venomous snake from the Colubridae family (Jablonski and Ahmad, 2023) which is the largest, most widespread and diverse, and is a species rich family that occupies all continents of the world except Antarctica (Baran and Atatur, 1998; Hongan 2012; Leviton 1992). This species is known as the nut snake, or Asian racer or the coin snake, tiger snake, or mountain racer (Kazemi et al, 2023), which was known in the past by its scientific name Coluber nummifer (Schatti B et al 2009). It has a relatively long and slender body and the maximum body length reaches a meter (Disi et al, 2001), and its color is grayish brown with dark brown spots tending to black and eyes are large and round. Which helps it see well while hunting, and it is active during the day (Disi et al, 2001). Individuals of this species live on rocky slopes with sparse plant cover, hide under stones (Ananjeva et al, 2006) where they often and feed mainly on reptiles and Arthropoda

(insects and spiders) and earthworms, which eliminate their toxic counterparts and they also feed on small mammals, birds, lizards and rodents.

Previous Studies in Syria

Several surveys have investigated the amphibians and reptiles of Syria, although a substantial proportion of this work has been conducted by researchers from outside the country. Early investigations of the Syrian herpetofauna date back to Böttger (1878), whose work contributed to the documentation of amphibians and reptiles occurring in Syria, Palestine, and Cyprus. Subsequent studies expanded knowledge of the diversity and distribution of amphibians and reptiles throughout Syria.

According to Al-Masry et al. (2002), approximately 116 species of amphibians and reptiles have been recorded in Syria, including 30 species belonging to the family Colubridae. Among these species is

Hemorrhois nummifer. The species has subsequently been documented in several biodiversity and protected-area surveys. It has been recorded in Al-Fernalq Reserve, Jabal Abd Al-Aziz Reserve, and Abu Qubais Reserve as part of the reptile fauna occurring within these ecosystems (Al-Masry et al., 2009).

Amr et al. (2007) also documented **H. nummifer** in agricultural environments located close to human settlements in the rural areas of Hama and Latakia. Sindaco et al. (2006) recorded the species in two environmentally contrasting regions of Syria: the Palmyra region and the Shuh and Al-Laza Reserve in Al-Salanfa within the Latakia mountain range. A specimen was also reported near a cave in the village of Al-Hamamah overlooking the Orontes River.

Further records were incorporated into studies mapping the geographical distribution of reptiles and amphibians throughout Syrian territory. Research on the reptiles of the Levant has additionally highlighted the ecological continuity and geographical distribution of **H. nummifer** between Jordan and southern Syria, particularly in the Daraa and Suwayda regions (Disi, 2002).

Historical taxonomic investigations are also important for understanding the species in Syria. Angel (1936) examined specimens collected from Syria and described a subspecies referred to as **Hemorrhois nummifer pallary**, based on material originating from the Hama region along the Orontes River (Schätti, 2010). Amr et al. (2007) further discussed the conservation status of the species and included it among reptiles of conservation concern.

Geographical Distribution

Hemorrhois nummifer has a relatively broad geographical distribution extending across parts of southeastern Europe, western Asia, and the Middle East. Its recorded range includes southwestern Türkiye, some Greek islands, Cyprus, southern Russia, Syria, northern Iraq, Lebanon, Egypt, Jordan, and northeastern Iran (Alizadegan et al., 2025; Ananjeva et al., 2006; Sindaco et al., 2013; Göçmen et al., 1996, 2008; Moravec & Modrý, 1994).

The occurrence of the species across regions characterized by different climatic and topographical conditions indicates a considerable degree of ecological adaptability. Within Syria, previous records demonstrate its occurrence in mountainous, forested, agricultural, semi-arid, and human-modified environments.

Taxonomic Classification of Hemorrhois nummifer (Reuss, 1834).

- Kingdom: Animalia

- Phylum: Chordata
- Class: Reptilia
- Order: Squamata
- Family: Colubridae
- Genus: Hemorrhois
- Species: Hemorrhois nummifer

Significance of the Research

Hemorrhois nummifer plays an important ecological role within the habitats in which it occurs. As a predator, the species contributes to the regulation of populations of rodents, arthropods, and other small animals and therefore participates in maintaining ecological balance and the stability of local food webs. Its predation on rodents and agricultural pests may also provide indirect benefits to agricultural ecosystems.

Snakes constitute important components of terrestrial ecosystems and can contribute to the regulation of prey populations. Their occurrence and distribution may also provide useful information regarding habitat conditions and ecological change. Consequently, understanding the distribution, habitat preferences, and biological characteristics of **H. nummifer** is important from both ecological and conservation perspectives.

The need for the present study is particularly evident because relatively few detailed local investigations have focused on **H. nummifer** in northwestern Syria. In addition, the species may be subjected to unnecessary killing and hunting because of public fear and limited awareness of its ecological importance. These pressures may become particularly relevant in areas where residents have returned to settlements that were previously abandoned during the war and where encounters between humans and wildlife have consequently increased.

Accordingly, documenting the species and its habitats can contribute to improving scientific knowledge of the local herpetofauna while also supporting environmental awareness and conservation efforts.

Objectives of the Research

The present study aims to:

- characterize **H. nummifer** taxonomically using morphometric measurements and scale counts;
- investigate its geographical distribution in northwestern Syria, particularly within Idlib Governorate;
- examine the relationship between its distribution and the environmental and topographical characteristics of the study sites; and
- contribute to environmental awareness regarding the ecological importance of this

non-venomous species, particularly its role as a natural predator of agricultural pests.

Study Population and Sample

The study population consisted of **H. nummifer** individuals occurring at selected sampling stations representing the environmental diversity of northwestern Syria. A total of **83 specimens** were collected from the selected study sites during 2025–2026 and across different periods of the year.

The sampling stations represented several major habitat types, including forested areas, mountainous environments, agricultural lands, and residential areas. The inclusion of environmentally diverse sites enabled comparison of the occurrence of the species under different ecological and topographical conditions.

Study Area

Idlib Governorate is located in northwestern Syria and is generally characterized by a Mediterranean climate, with mild, rainy winters and hot, dry summers. The governorate displays considerable topographical and ecological diversity, ranging from mountainous areas and rocky slopes to agricultural plains, forested habitats, and human settlements.

This environmental heterogeneity provides a variety of potential habitats for reptiles, including **H. nummifer**, and makes the region particularly suitable for investigating relationships between species distribution and environmental characteristics.

Laboratory examinations and measurements associated with the study were conducted at the laboratories of the Faculty of Science, Lattakia University.

Research Materials and Methods

Research Materials

The field and laboratory investigations employed the following materials and equipment:

- traps for capturing snakes;
- GPS equipment for recording geographical coordinates;
- portable night lamps for field surveys;
- bait used in traps, including boiled eggs, lizards, and insects;
- glass containers with capacities of approximately 250–500 g;
- biometric and morphometric measurement tools; and
- Google Earth for mapping sampling locations and visualizing the geographical distribution of the species.

Morphometric and Squamous Measurements

We took basic measurements such as the total length of the body (ToL) /Total length/, and the length of the tail (TL) / Tail length/. We measured the ratio of tail length to total length TL/TOL, and measured the ratio of head length HL /Head length/ to total length HL/TOL, and measured the width of the front of the head /Snout width /SW, for the width of the head /Head width /HW SW/HW, and measured the width of the head to the width of the front of the head from the ventral side HW/SVL. We also took the number of rows. The number of dorsal scales)MDS(/Midbody Dorsal Scales/, the number of ventral scales)VS(Ventral Scale, the number of subcaudal scales SCS/Sub Caudal Scales/, the number of preoculars /Pro/, the number of anterior temporal scales (Ant /Anterior temporals), the number of posterior temporal scales /posterior /Pot, and the supralabial scales (Sul/ /Sub Labiale, and under the lip)Ila(Infra labial/, for /83/ specimens. Tables)1(and)2(show the morphometric measurements and the number of scales for the studied species

Characterization of the Species Hemorrhoids nummifer

The dorsal surface of Hemorrhoids nummifer is predominantly grayish-brown and marked by a series of dark brown to nearly black spots extending along the body toward the tail. In juvenile individuals, these markings tend to be irregular in shape and distribution, whereas in older individuals they become more distinctly arranged along the dorsal midline, producing the characteristic pattern associated with the species. The head is rounded anteriorly and slightly flattened. Adult individuals examined in the study had a total body length ranging from approximately 750 to 1,000 mm. The ventral surface is generally yellowish with a gray tinge, as illustrated in Figure 1. The dorsal scales are arranged in 23 longitudinal rows. The anterior head shields are relatively larger than the posterior shields, as illustrated in Figures 2 and 3. Both the anal plate and the subcaudal scales are divided. These morphological characteristics, particularly body coloration, scale arrangement, head morphology, and ventral features, provide important diagnostic criteria for the identification and taxonomic characterization of the species. Detailed scale counts and morphometric measurements of the examined specimens are presented in Tables 1 and 2, respectively.



Figure 1. General shape of the body.



Figure 2. A: Dorsal face of the body; B: Ventral face of the body.



Figure 3. A+C: Ventral face of the head; B: Dorsal face of the head; C: Ventral scales

Distribution, Geographical Range, and Environmental Characteristics of the Study Sites

Individuals of *Hemorrhois nummifer* were collected from several sampling stations representing diverse climatic, topographical, and ecological conditions across northwestern Syria, between approximately 35.4° and 35.9° N latitude. In Saraqib, situated at an elevation of approximately 363 m above sea level, specimens were mainly recorded in open inland plains and plateau environments characterized by a semi-arid climate. Most individuals from this locality were collected from agricultural fields cultivated with annual crops, particularly cumin. Two additional sampling stations were located in Jabal Al-Zawiya, specifically Kafr Aweid and Al-Bara. These mountainous areas, situated at approximately 900 m above sea level, are characterized by cold winters and relatively mild summers. A considerable proportion of the specimens collected from these sites were found in residential areas that had been abandoned during the war, suggesting that reduced human disturbance may provide suitable refuges for the species. Specimens were also recorded in the Al-Laj area, which is

characterized by a heterogeneous landscape combining rocky slopes, shrubby vegetation, and lower plains with fertile agricultural soils used for growing autumn and summer vegetables. This locality lies at an elevation of approximately 234 m above sea level. In the Al-Habit area, situated on a plateau at approximately 600 m above sea level, individuals were collected from a relatively warm agricultural environment known particularly for potato cultivation. The species was additionally documented in the Jisr Al-Shughour region, specifically at Al-Sukkariyya, where the climate is comparatively warm and humid and the elevation is approximately 170 m above sea level. The occurrence of *H. nummifer* across these ecologically diverse localities indicates its ability to occupy a broad range of habitats, including agricultural fields, rocky and shrubby landscapes, mountainous environments, and abandoned residential areas. The geographical distribution of the sampling stations is presented in Figure 4.

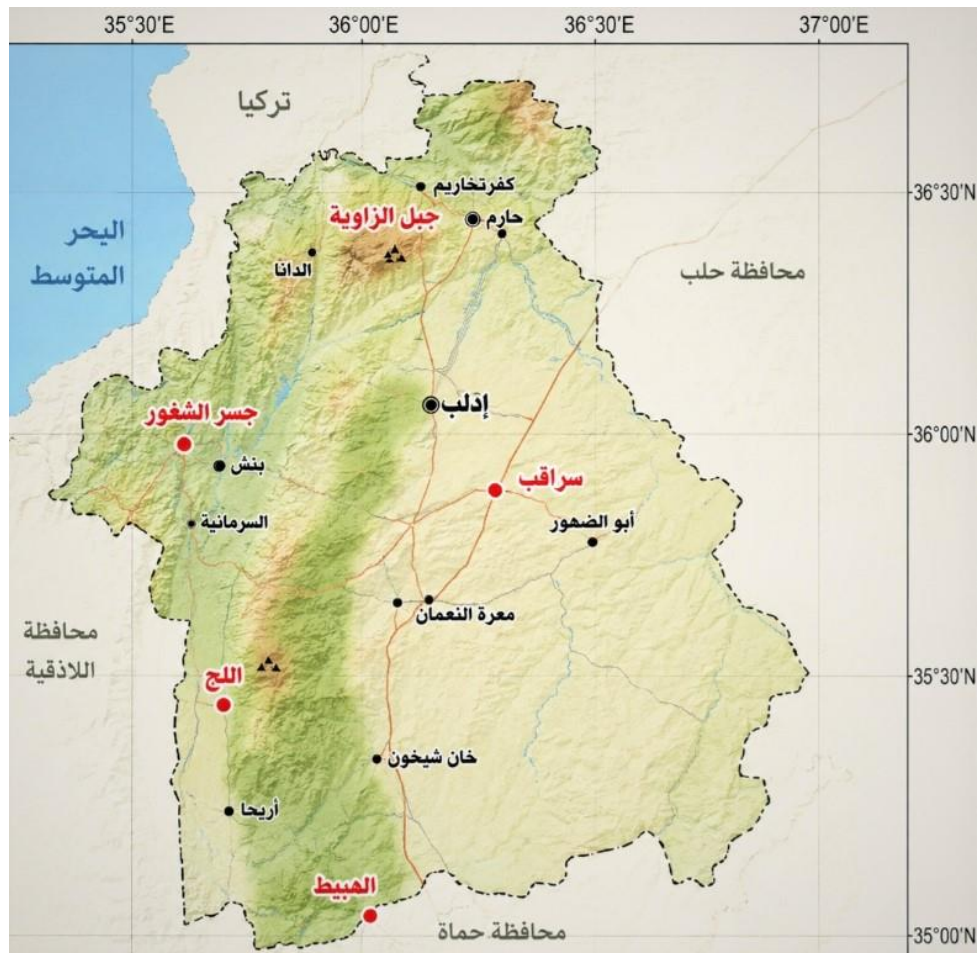


Figure 4. Collection stations in Idlib Governorate.

Environmental Distribution and Habitat Preferences

From an ecological perspective, **Hemorrhoids nummifer** was recorded across a large proportion of northwestern Syria, particularly within Idlib Governorate. The species was observed most frequently in forested environments, agricultural lands, rocky habitats, and areas characterized by moderate to warm climatic conditions.

Its occurrence appeared to be comparatively limited in densely inhabited residential areas. In contrast, the species was frequently encountered in abandoned residential settlements. This pattern may be related to reduced human disturbance and the availability of suitable shelter, prey, and undisturbed microhabitats in abandoned buildings and surrounding areas.

Discussion

The morphometric measurements and morphological characteristics recorded in the present study, including scale counts, coloration patterns, body proportions, and other diagnostic features, were generally consistent with those reported in previous studies of **H. nummifer** (Jablonski & Ahmad, 2023; Schätti et al., 2001; Sindaco et al., 2013; Fathinia et al., 2010). This agreement supports the taxonomic identification of the examined specimens and indicates that the

morphological characteristics of the population studied in northwestern Syria are broadly comparable with those reported from other parts of the species' geographical range.

Regarding geographical and ecological distribution, **H. nummifer** was recorded at all selected sampling stations. The species was particularly common in rocky habitats, where rocks provide suitable shelters and hiding places. Specimens were also collected from agricultural lands, grassy areas, cultivated fields, and forested habitats. These observations are generally consistent with previous reports from Syria and neighboring regions (Al-Masry et al., 2002, 2009; Disi et al., 1996; Sindaco et al., 2006; Göçmen et al., 2008). The occurrence of the species in agricultural environments also appeared to be associated with the availability of potential prey, particularly rodents and insects. This observation emphasizes the ecological importance of **H. nummifer** as a natural predator within agricultural ecosystems. By feeding on organisms that may act as agricultural pests, the species may contribute to the biological regulation of populations that can damage economically important crops, including cereals, potatoes, and vegetables. Its presence therefore represents an important component of ecological balance within both natural and agricultural habitats.

The study further indicated that **H. nummifer** tends to avoid areas characterized by intensive human activity. Its relatively frequent occurrence in villages and residential areas that had been abandoned during the war may consequently be associated with reduced human disturbance and increased availability of undisturbed shelters and prey.

Comparison with Neighboring Countries

The occurrence of **H. nummifer** in northwestern Syria is consistent with its broader geographical distribution across neighboring countries. Previous studies have documented the species in Türkiye, Iraq, Jordan, and other parts of the Middle East (Alizadegan et al., 2025; Ananjeva et al., 2006; Sindaco et al., 2013).

The findings of the present study therefore contribute additional locality records from northwestern Syria and provide further evidence of the species' ability to occupy a variety of environmental conditions across its regional distribution. Its presence in mountainous, rocky, forested, agricultural, and human-modified habitats also suggests considerable ecological adaptability.

Recommendations

Based on the findings of the present study, the following recommendations are proposed:

- **Develop a genetic profile of *H. nummifer*** using appropriate molecular techniques and establish a genetic database that can serve as a reference for future taxonomic, ecological, and conservation studies.
- **Increase public environmental awareness** regarding the ecological importance of **H. nummifer**, particularly emphasizing that it is a non-venomous snake that may benefit agricultural environments through its role as a natural predator of rodents and other potential pests.
- **Reduce unnecessary killing and hunting** of the species by improving public understanding and addressing misconceptions and fear associated with snakes.
- **Protect natural and semi-natural habitats** that provide suitable shelter, feeding areas, and breeding environments for **H. nummifer** and other reptile species.
- **Conduct additional local surveys and ecological studies** of snake diversity in northwestern Syria to improve understanding of species distribution, habitat preferences, population status, and conservation requirements.
- **Expand future research to include molecular and genetic analyses**, which could provide further information on population structure, geographical variation, and relationships between Syrian populations and those occurring in neighboring countries.

REFERENCES

1. Alizadegan, A., Mozaffari, N., Nowruzi M and Rahimi S.(2025). First observation of predation on an amphibian by a coin- marked snake *Hemorrhois numifer* in Iran. *Reptiles and Amphibians*.32(1)Pp:23-31.
2. Al-Masry, A)2002(. The condition of reptiles and amphibians in Syria. United Nations Development Program Global Environment Facility UNDP /GEF National Biodiversity Strategy and Action Plan SYR/97/G31.
3. Al-Masry, A., Humaidan. H., Saleh M, and Al-Halabi W)2009(. Rapid assessment by field survey of amphibians and reptiles in the Jabal Abdul Aziz Reserve. *Biodiversity conservation and reserve management project SYR1051010*.
4. Amr, A ., Shehab, A and Abu Baker(2007).Recent observations on the herpetofauna of Syria with notes on trade in reptiles.20(1/2). Pp:21-26.
5. Amr Z.S; Al-Oran R and Disi A. M (1994). Reptiles of southern Jordan. *The Snake*.26(1).Pp: 41-49.
6. Ananjeva,N.B.,Orlov,N.L.,Khalikov,R.G.,Darevs ky,I.S;Rybov,I.S and Barabanov,A.V(2006).AnAtlas of the Reptiles of north Eurasia.Taxonomic,Diversity, Distribution,Conservation status.Pensoft Series Faunistica 47,Sofia,Bulgaria
7. Baran, I and Atatur, M.K(1998).Turkish Herpetofauna(Amphibians and Reptiles).T.C.Cevre Bakanligi,Ankara.
8. Disi A. M. and Boehme, W (1996). Zoogeography of the amphibians and reptiles of Syria, with additional new records. *Herpetozoa* V (9) PP.: 63-70.
9. Disi A; Amr Z; Defosse D(1988). Contribution to herpetofauna of Jordan, Snakes of Jordan. *The Snake*. V (20) PP.: 40-51.
10. Disi A. M.; Modry D.; Necas P. and Rifai L., (2001). Amphibians and reptiles of the Hashemite Kingdom of Jordan. Frankfurt a. m 408pp.
11. Fathinia, B., Rastegar- Pouyani, N.,Darvishnia, H and Rajabizadeh, M (2010).The snake founa of Ilam province ,southwestern Iran. *Iranian of animal biosystematic* V6(1).Pp:9-23.
12. Göçmen,B.,Werner,YL and Elbeyli,B(2008).Cannibalism in *Dolichophis jugularis*(Serpents:Colubridae):more thanrandom?Current Herpetology.V(27).Pp:1-7.
13. Göçmen. B., Rastgeldi, S and Özbel, Y (1996).Sürüngeplerde(Reptilia) *Cryptosporidium* Tyzzer, 1907(Protista: Apicomplexa: Coccidia ve *Cryptosporidium* Türkiye Parazitoloji Dergisi.25(4).Pp: 335-338.
14. Hongan, C. M., (2012). World wildlife funa Registan, North Pakistan sandy desert .National council for science and environment. V: (24) PP.:156-180.
15. Jablonski, D and Ahmad, S(2023). Re- evaluation first impressions melanism in *Hemorrhois nummifer* (Reuss,1834) from Kurdistan Region,Iraq.Zoology in the Middle East 69 (3).243-247.
16. Kazemi, S., Jahan, M., Kalat, M(2023).Local

envenoming by the coin snake or Asian racer, Hemorrhoids numifer and mountain racer or leopard snake, Hemorrhoids ravergeri (Serpentes: Colubridae Colubrinae) in Iran. Elsevier-Toxicon 226.Pp: 70-76.

17. Leviton, A., Anderson, S., Alder, K and Minton, S(1992). Handbook to Middle East Amphibians and Reptiles- society for the study of Amphibians and Reptiles publication. Oxford, Ohio-USA.
18. Moravec, J and Modaró, D(1994). New herpetological record for Syria. Acta Univ. Carol. Biol. V(38). Pp: 59-64.
19. Schatti, B and Utiger, U(2001). Hemerophis, a new genus for Zamenis scotiae Gunther, and a contribution to the phylogeny of old world racers, whip snakes, and related genera (Reptilia: Squamata: Colubridae). Revue Suisse de Zoologie. 108(4). Pp: 919-984.
20. Schatti, B (2010). Coluber nummifer Reuss, 1834 (currently Hemorrhoids nummifer; Reptilia, Serpentes): proposed conservation of the specific name. Bulletin of Zoological Nomenclature 67(1). Pp: 44-52.
21. Sindaco, R., Serra, G and Mengon, M(2006). New data on the Syrian herpetofauna, with a newly – recorded species of snake – Zoology in the Middle East, Heidelberg. V (37) .Pp: 29-38.
22. Sindaco, R., Venchini, A and Grieco, C(2013). The reptiles of the western Palearctic, volume 2: Annotated checklist and distributional Atlas of the snakes of Europe, North Africa, Middle East and central Asia, with an update to volume 1. Monografie della Societas Herpetologica Italica. Edizioni Belvedere, Latine Snake. 26(1). P

About the Author

Dr. Hanan Bakour Al-Khalil holds a PhD in Animal Life Sciences, with a specialization in Wildlife Ecology. She is currently a faculty member in the Department of Zoology, Faculty of Science, Lattakia University, where she teaches both theoretical and practical components of courses in Fundamentals of Animal Ecology and Animal Taxonomy. Her research interests include molecular biology and genetic analysis, particularly DNA extraction and polymerase chain reaction (PCR) techniques. She is also experienced in the use of bioinformatics tools for DNA and RNA analysis, including sequence searching, alignment, comparison, and submission to international databases such as NCBI and BLAST. In addition, her academic skills include reference management, literature searching, scientific writing, and the preparation of research articles. Her work combines expertise in wildlife ecology, animal taxonomy, molecular techniques, and bioinformatics.



This is an open access article distributed under the terms of the [Creative Commons Attribution-NonCommercial 4.0 International](https://creativecommons.org/licenses/by-nc/4.0/) (CC BY-NC 4.0) which allows reusers to distribute, remix, adapt, and build upon the material in any medium or format for noncommercial purposes only, and only so long as attribution is given to the creator.