Russian J. Theriol. 23 (1): 52–56

On the occurrence of the Indomalayan long-tailed climbing mouse *Vandeleuria oleraceus* (Rodentia: Muridae) in eastern Indochina

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ABSTRACT. The distribution of *Vandeleuria oleraceus* in eastern Indochina was analysed based on the available information and museum specimens. There are a few records from Laos, the only confirmed locality in Cambodia and records from north-western and southern Vietnam. The population from southern Vietnam (Dalat Plateau) is likely to be a geographic isolate that could represent a distinct taxon.

How to cite this article: Abramov A.V., Kruskop S.V., Nguyen T.S. 2024. On the occurrence of the Indomalayan long-tailed climbing mouse *Vandeleuria oleraceus* (Rodentia: Muridae) in eastern Indochina // Russian J. Theriol. Vol.23. No.1. P.52–56. doi: 10.15298/rusjtheriol.23.1.06

KEY WORDS: Cambodia, Laos, Vietnam, distribution, habitats, *Vandeleuria*.

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Распространение пальмовой мыши *Vandeleuria oleraceus* (Rodentia: Muridae) в Восточном Индокитае

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РЕЗЮМЕ. На основе опубликованной информации и музейных экземпляров проанализировано распространение *Vandeleuria oleraceus* в Восточном Индокитае. Известны несколько находок с территории Лаоса, одно подтвержденное местонахождение в Камбодже и экземпляры из северо-западного и южного Вьетнама. Популяция южного Вьетнама (плато Далат) с высокой вероятностью представляет собой географический изолят и, возможно, может быть самостоятельным таксоном.

КЛЮЧЕВЫЕ СЛОВА*:* Камбоджа, Лаос, Вьетнам, распространение, местообитания, *Vandeleuria*.

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Introduction

The Asian long-tailed climbing mice of the genus *Vandeleuria* Gray, 1842 are widespread across South and Southeast Asia. These small-sized mice have a long tail, with the first and fifth digits of both hands and feet being partially opposable and having nails instead of claws (Fig. 1). According to the recent taxonomy (Musser & Carleton, 2005; Fabre, 2017), the genus consists of three species: viz., the Nilgiri vandeleuria, *V. nilagirica* (Jerdon, 1867), endemic to tropical rainforests along the Western Ghats, India; the Sri Lankan vandeleuria, *V. nolthenii* Phillips, 1929 known from Sri Lanka, and the Indomalayan vandeleuria, or the Indomalayan long-tailed climbing mouse, *V. oleraceus* (Bennett, 1832) that is widespread across the continental South Asia, southern China and the mainland of Southeast Asia. Fabre (2017) demonstrated that the generic name *Vandeleuria* is masculine in gender, so that the widely used species name *oleracea* should have been changed for gender agreement to *oleraceus*.

Fig. 1. Indomalayan long-tailed climbing mouse *Vandeleuria oleraceus*. Southern Vietnam, Lam Dong Province. Scale is 5 cm.

In South Asia, *V. oleraceus* has been recorded from Bangladesh, Bhutan, throughout India, and Nepal, occurring at the elevations from 200 to 1500 m asl (Aplin & Molur, 2017). In China, it is limited to western and southern Yunnan (Smith & Lunde, 2008). The species distribution in Southeast Asia is inadequately known. The majority of museum specimens are known to have originated from India, with only a few records from the eastern part of the species' range. Musser & Carleton (2005) described the range in Southeast Asia as being spread from Myanmar in the west to Thailand (north of the Isthmus of Kra), southwestern Cambodia (Cardamom Mtns) and southern Vietnam, and also reported as probably occurring in southern Laos. The species listed as Least Concern in the IUCN Red List in view of its wide distribution and presumed large population (Aplin & Molur, 2017), however its occurrence and status in the eastern part of the species' range is poorly understood.

The aim of this study to clarify the occurrence of *V. oleraceus* in Eastern Indochina based on available information and museum specimens.

Materials and methods

The collections from Vietnamese (the Institute of Ecology and Biological Resources, VAST, Hanoi; Zoological Museum, Hanoi University of Science, Hanoi) and Russian (Zoological Institute, Russian Academy of Sciences, Saint Petersburg; Zoological Museum, Moscow State University, Moscow) depositaries have been checked. We have also analysed both the literature-derived data and the information from museum collections available from the Consortium of Small Vertebrate Collections (www.csvcoll.org) and the Global Biodiversity Information Facility (www.gbif.org).

Results

Distribution in Laos. Some range maps suggest that the species occurs throughout Laos (Marshall, 1977; Corbet & Hill, 1992), whereas others are of the opinion that it occurs only in northern and central Laos (Francis, 2008; Aplin & Molur, 2017; Fabre, 2017). In fact, there are just a few museum specimens collected from the northern, central and southern parts of the country (Table, Fig. 2).

Distribution in Cambodia. Most recent distribution maps for *V. oleraceus* in Cambodia (Francis, 2008; Aplin & Molur, 2017; Fabre, 2017) are based on the information from Musser & Carleton (2005: 1518): "SW Cambodia (Cardamom Mtns; A. Smith, in litt., 2002)". Yet, actually no specimens have been known from southwestern Cambodia to date. The only confirmed records of the species are those from central Cambodia (Fig. 2). Fillieux *et al*. (2017) listed three specimens collected during the 2016 field surveys in Kampong Thom Province (Table).

Distribution in Vietnam. Some authors show the species distribution map covering entire northwestern, central and southern Vietnam (Lunde & Nguyen, 2001; Kuznetsov, 2006; Fabre, 2017). In fact, there are just two localities from where *V. oleraceus* was recorded: Hoang Lien Son Mts in the northwestern part of the country and Dalat Plateau in the southern part (Fig. 2). We have not found any data on the species' occurrence in central Vietnam.

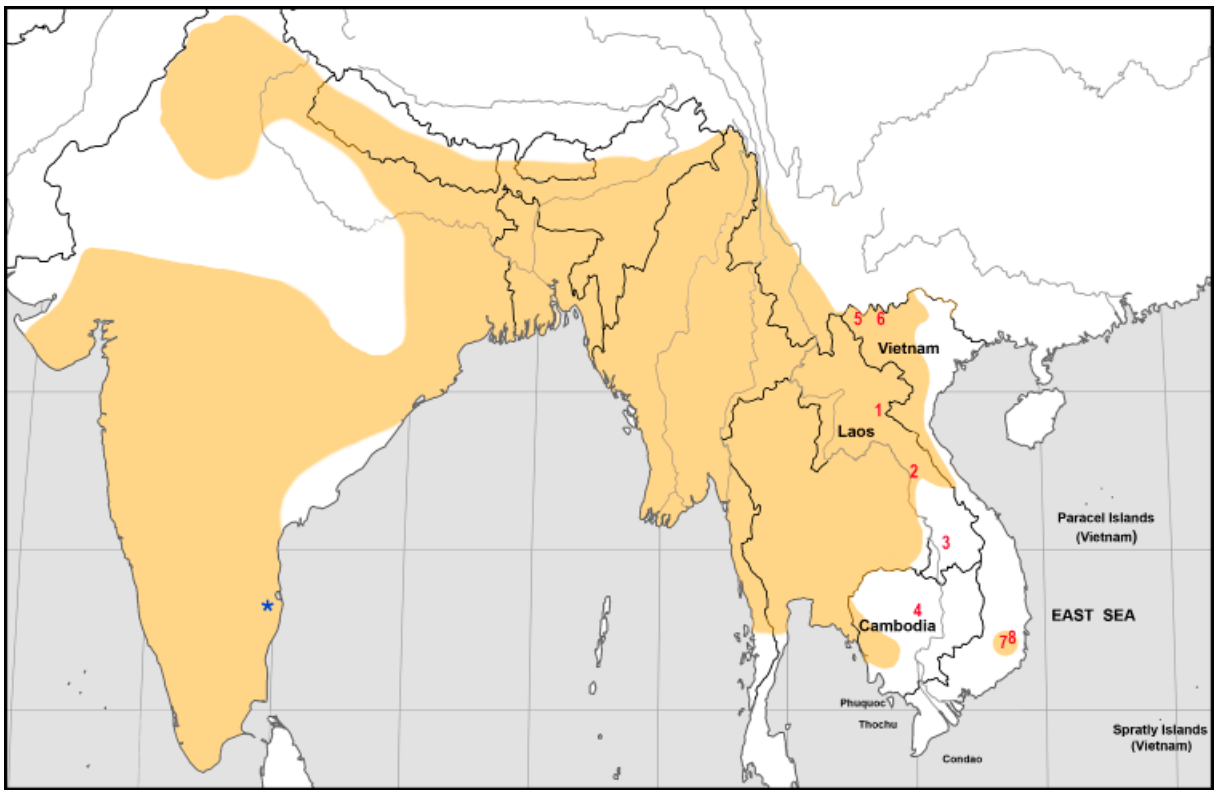

Fig. 2. Distribution of *V. oleraceus* (from Aplin & Molur, 2017). The records from eastern Indochina are mapped as red numbers (see Table). The type locality of *V. oleraceus* (India, Madras, Deccan region; following Musser & Carleton, 2005) is marked by an asterisk.

Habitats of *V. oleraceus* in Eastern Indochina. In South Asia, it occurs in dry deciduous forests with bamboo brakes, moist deciduous forest, temperate forest, open forests interspersed with grasslands and scrub, montane wet zone (Molur *et al*., 2005; Fabre, 2017). It is an arboreal species that prefers thick vegetation and lives on understory trees, shrubs, at forest edges with dense tangles of vines and vegetation and dense grassy vegetation, and even in piles of brush (Smith & Lunde, 2008; Aplin & Molur, 2017). It has been recorded in tall cane in Thailand (Marshall, 1977) and in the harvested remains of peanut fields in Myanmar (Aplin & Molur, 2017).

In Cambodia, the species was collected from both disturbed (on-going clearing), and cleared (recently converted to agriculture) areas (Pruvot *et al*., 2024). A disturbed zone was clearly identified but had not been fully converted, and was therefore «older» than the cleared zone. However, this was still within a maximum of two years past initial disturbance.

In northwestern Vietnam, the species was collected from the vicinity of Muong Boum Village. The habitats around the village included rice fields along the valley of Nam Boum River and forested lower slopes of the mountains. On higher slopes of the mountains surrounding the village, there is a considerable bamboo jungle and tall grass burned frequently by local people (Bangs & van Tyne, 1931). We have not found any information about the habitats in Thai-Nien locality. The elevations of north Vietnamese records are rather low — from 90 m asl (300 f, Thai-Nien) to near 300 m (Muong Boum). In southern Vietnam, the species was collected from tall reeds thickets near a small spring (Cong Troi, V. Suntsov, in litt., 2024). The specimen from Giang Ly was collected from dense grassy vegetation at a pine forest edge. All the records from southern Vietnam came from high elevations above 1400 m asl (Table).

Conclusion

The distribution of *V. oleraceus* in eastern Indochina is yet poorly understood. It seems that the species range in Vietnam consists of two separate and not-connected sites lying in the northwestern and southern parts of the country. The northwestern part is undoubtedly connected to western populations in Laos and, probably, in Yunnan. However, the southern site (Dalat Plateau) might represent an isolated mountain population of the species. The mammal fauna of Dalat Plateau is characterised by a high level of endemism (Abramov & Tran, 2017). This Plateau seems to have acted as a “closed pocket”, reflecting colonisation history events for small mammals (Meschersky

Table. List of the recorded specimens of *Vandeleuria oleraceus* from eastern Indochina.
The following museum acronyms preceding specimen numbers are used: NHM, the Natural History Museum, London, UK; FMNH, the Field Museum of Natural History, Chicago, USA; ZIN, Zoological Institute, Russian Academy of Sciences, Saint Petersburg, Russia; ZMMU, Zoological Museum, Moscow State University, Moscow, Russia; MNHN, Museum national d'Histoire naturelle, Paris, France; USNM, Smithsonian Institution, National Museum of Natural History, Washington, USA; AMNH, American Museum of Natural History, New York, USA; ZMUH, Zoological Museum, VNU University of Science, Hanoi, Vietnam.

No. on Fig. 2	Localities, coordinates	Altitude (meters above sea level)	Museum ID number or citation
Laos			
1	Ban Theuong, 18 Km NW Xieng Khouang, ~19.4167° N, 103.5° E	1052	USNM 355554
1	Xien-Kuang-Koo (= currently Xieng Khouang, ~19.4167° N, 103.5° E)	ca.1000	NHM 1926.10.4.171
2	Montagnes de Lakhon (= Khammuane Province, Thakhek, ~17.4° N, 104.8° E)	ca.150	MNHN MO-1996-2076
3	Plateau des Bolovens (~15° N, 106° E)	762	AMNH M-87557
3	Plateau des Bolovens (~15° N, 106° E)	762	AMNH M-87560
3	Plateau des Bolovens (~15° N, 106° E)	762	AMNH M-87558
3	Plateau des Bolovens (~15° N, 106° E)	762	AMNH M-87559
Cambodia			
4	Kampong Thom Province, Sro Lov Sroung, 12.8539° N, 105.373° E	ca.90	Fillieux *et al*., 2017
4	Kampong Thom Province, Sro Lov Sroung, 12.8539° N, 105.3726° E	ca.90	Fillieux *et al*., 2017
4	Kampong Thom Province, Sro Lov Sroung, 12.8519° N, 105.376° E	ca.90	Fillieux *et al*., 2017
Vietnam			
5	Tonkin, Cac ba I, Muong Boum (= Lai Chau Province, 22.3833° N, 102.8167° E)	ca.300	FMNH 32452 (holotype *Vandeleuria oleracea scandens* Osgood, 1932)
6	Tonkin, Thai-Nien (= Lao Cai Province, 22.4075° N, 104.1067° E)	ca.90	NHM 1921.1.1.107
6	Tonkin, Thai-Nien (= Lao Cai Province, 22.4075° N, 104.1067° E)	ca.90	NHM 1921.1.1.106
7	Langbian Peak (=Lam Dong Province, 12.0833° N, 108.5° E)	ca.2100	FMNH 46733
7	Lam Dong Province, Cong Troi (12.0833° N, 108.3781° E)	1600	ZMMU S-167104
7	Lam Dong Province, Cong Troi (12.0833° N, 108.3781° E)	1600	ZMMU S-167102
7	Lam Dong Province, Cong Troi (12.0833° N, 108.3781° E)	1600	ZMMU S-167103
7	Lam Dong Province, Cong Troi (12.0833° N, 108.3781° E)	1600	ZMMU S-178392
8	Lam Dong Province, Lạc Duong District, Giang Ly (12.1789° N, 108.6789° E)	1400	ZIN 107739
	Vietnam (no exact data)		ZMUH Mn.2401

et al., 2016). Only here are found such narrow-ranged, endemic species as the white-toothed shrew *Crocidura indochinensis* (Bannikova *et al*., 2011), the mole *Euroscaptor parvidens* (Zemlemerova *et al*., 2016; Bui *et al*., 2020), the rats *Rattus osgoodi* (Lunde & Nguyen, 2001) and *Leopoldamys milleti* (Balakirev *et al*., 2013), and the bats *Murina harpioloides* (Nguyen *et al*., 2015) and *Myotis phanluongi* (Kruskop, 2013). It is also where distinct genetic lineages of the Indomalayan pencil-tailed tree mouse *Chiropodomys gliroides* (Meschersky *et al*., 2016) and the Langbian tree rat *Chiromyscus langbianis* (Balakirev *et al*., 2021) have been found. In view of the above, it is highly likely that the population of *V. oleraceus* from southern Vietnam could also represent a distinct genetic lineage or a new undescribed taxon (of a subspecies or even species rank).

ACKNOWLEDGEMENTS. Our studies in Vietnam were possible due to the logistic and financial support of the Joint Vietnam-Russian Tropical Research and Technological Centre (project Ecolan E-1.2). We would like to express our sincere thanks to A.N. Kuznetsov, P.V. Yushchenko, N.A. Poyarkov and all expedition members for their great help and scientific expertise during the fieldworks. We also wish to thank Dr. Viktor Suntsov for additional information on Vietnamese specimens, and Drs. Nguyen Thanh Nam and Hoang Trung Thanh supported to visit the Zoological Museum, VNU University of Science. We are obliged to Dr. Dmitry Logunov for improving the English of the final draft. We are grateful to anonymous reviewers for their valuable comments on the earlier version of the manuscript. This study was supported in part by the project "Research on the diversity of small mammals in the high mountain, cave and limestone eco-

systems of Northern and Central Vietnam" to NTS (ĐL0000.04/24-26) and the joint grant of the Russian Science Foundation and VAST No. 24-44-04004.

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