Building evidence for conservation globally

Journal of Threatened Taxa

Open Access

10.11609/jott.2024.16.11.26063-26186
www.threatenedtaxa.org

26 November 2024 (Online & Print)
16(11): 26063–26186
ISSN 0974-7907 (Online)
ISSN 0974-7893 (Print)

ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

Publisher
Wildlife Information Liaison Development Society
www.wild.zooreach.org

Host
Zoo Outreach Organization
www.zooreach.org

Srivari Illam, No. 61, Karthik Nagar, 10th Street, Saravanampatty, Coimbatore, Tamil Nadu 641006, India
Registered Office: 3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore, Tamil Nadu 641006, India
Ph: +91 9385339863 | www.threatenedtaxa.org
Email: sanjay@threatenedtaxa.org

For Focus, Scope, Aims, and Policies, visit https://threatenedtaxa.org/index.php/JoTT/aims_scope
For Article Submission Guidelines, visit https://threatenedtaxa.org/index.php/JoTT/about/submissions
For Policies against Scientific Misconduct, visit https://threatenedtaxa.org/index.php/JoTT/policies_various

continued on the back inside cover

Cover: Mixed media with fine liners, colour pencils, and watercolour background of an Indian funnel web spider. © Elakshi Mahika Molur.

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 November 2024 | 16(11): 26172–26175
ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)
https://doi.org/10.11609/jott.8727.16.11.26172-26175
#8727 | Received 07 September 2023 | Final received 26 August 2024 | Finally accepted 03 October 2024
OPEN ACCESS
NOTE

Phenotypic variations in Mindoro Warty Pig *Sus oliveri* (Cetartiodactyla: Suidae)

John Carlo Redeña-Santos [1], Anna Pauline O. de Guia [2], Nikki Heherson A. Dagamac [3] & Fernando García Gil [4]

[1,3] Research Center for the Natural and Applied Sciences, University of Santo Tomas, 1008 España, Manila, Philippines.
[1,2] Graduate School, University of the Philippines Los Baños, 4031 Laguna, Philippines.
[3] Department of Biological Sciences, College of Science, University of Santo Tomas, 1008 España, Manila, Philippines.
[1,2] Animal Biology Division, Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Baños, Los Baños, 4031, Laguna, Philippines.
[1,3,4] D'ABOVILLE Foundation and Demo Farm Inc., 1200, Makati City, Philippines.
[1,3] Initiatives for Conservation, Landscape Ecology, Bioprospecting and Biomodeling (iCOLABB), Research Center for the Natural and Applied Sciences, University of Santo Tomas, España Blvd, Sampaloc, Manila, 1008, Philippines.
[3] The Graduate School, University of Santo Tomas, España Blvd, Sampaloc, Manila, 1008, Philippines.
[1] WildlifeLink Research Consultancy Services, 4020, Laguna, Philippines.
[1] santosjcarlo@gmail.com (corresponding author), [2] aodeguia@up.edu.ph, [3] nhadagamac@gmail.com, [4] fgarciagil@gmail.com

Four native wild pig species of the *Sus* genus have been identified in the Philippines. Very little information is available on the Mindoro Warty Pig *Sus oliveri*. Formerly, this species was treated as a subspecies of *S. philippensis* until it was recognized as distinct by Groves (1997) based on four skulls and one known skin collected from Mayapang, Rizal, Occidental Mindoro (Groves 2001). There are no recognized subspecies of *S. oliveri,* but it is closely related to two subspecies of *S. philippensis* (Groves 1997). Currently, *S. oliveri* is recognized as Vulnerable and Endangered by the IUCN Red List (Schütz 2016) and the Philippine Red List Committee through Department Administrative Order 2019-09, respectively.

According to Meijaard et al. (2011), the head skin

Editor: Anoymity requested.

Date of publication: 26 November 2024 (online & print)

Citation: Redeña-Santos, J.C., A.P.O. de Guia, N.H.A.Dagamac & F.G. Gil (2024). Phenotypic variations in Mindoro Warty Pig *Sus oliveri* (Cetartiodactyla: Suidae). *Journal of Threatened Taxa* 16(11): 26172–26175. https://doi.org/10.11609/jott.8727.16.11.26172-26175

Funding: This study is funded by the Department of Science and Technology (DOST)-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) through its Grants-In-Aid (GIA) program. JCRS received funding from IDEAWILD Foundation and DOST- Accelerated Science and Technology Human Resource Development Program (ASTHRDP) for the conduct of this survey. NHAD received support from RCNAS and DOST-Balik Scientist Program. FGG and D'ABOVILLE Foundation received funding from Zoologische Gesellschaft für Arten- und Populationsschutz (ZGAP), Association française des parcs zoologiques (AFdPZ), Tierpark Berlin, and Mandai Nature for their survey in Aruyan-Malati.

Competing interests: The authors declare no competing interests.

Acknowledgements: JCRS would like to thank the IDEAWILD Foundation for the equipment grant, and the DOST-ASTHRDP for the scholarship granted during the conduct of this research. NHAD would like to acknowledge the DOST-PCAARRD for the support as a Balik Scientist and funding of Project MATAPAT. We like to thank WWF for sharing their camera trap photos. We are also grateful for the Mt. Calavite Wildlife Sanctuary Protected Area Management Office (MCWS-PAMO) and the Iraya and Taobuid indigenous communities for their continued support.

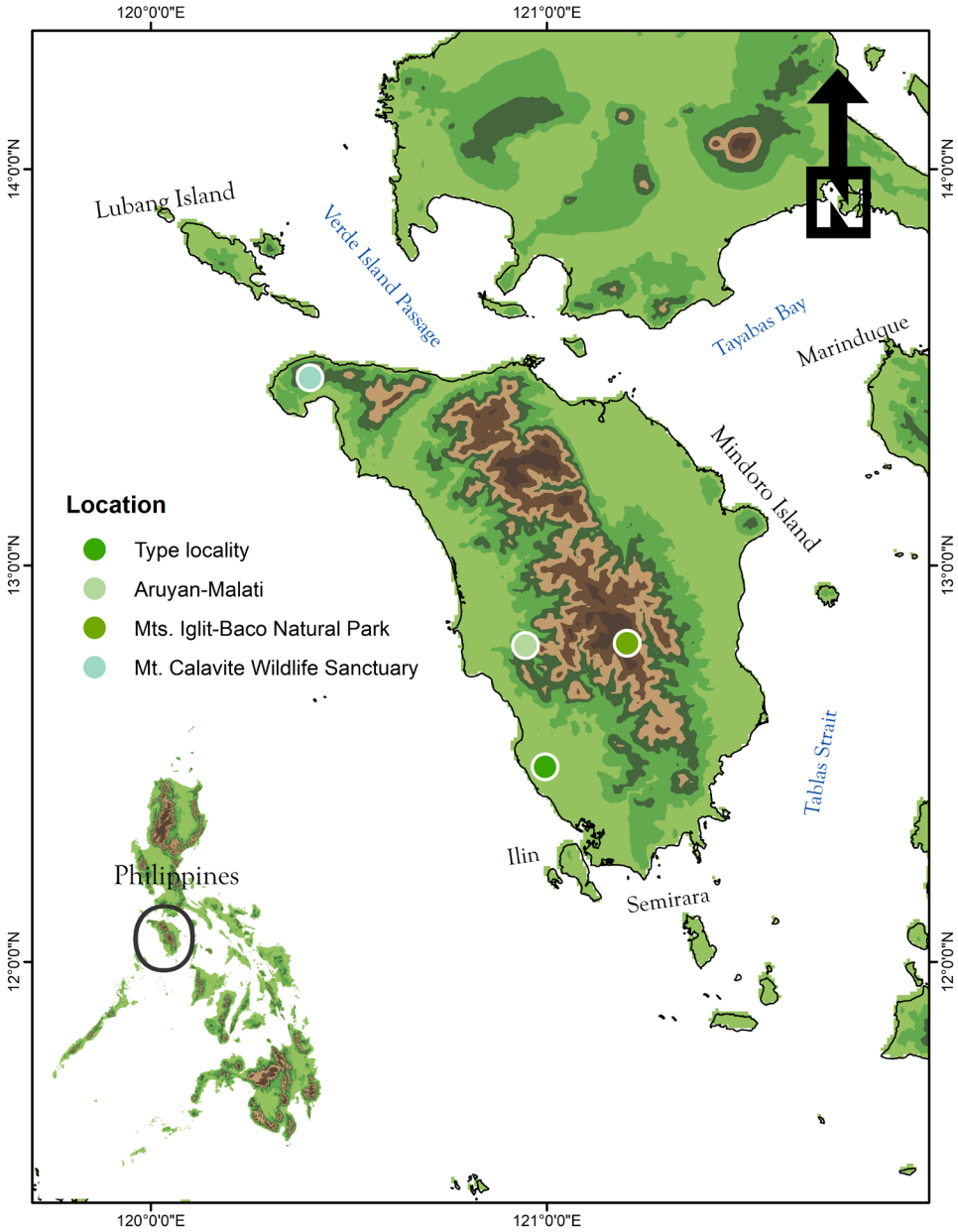

Figure 1. Map of Mindoro showing the area where the type locality and the camera trap photos of *Sus oliveri* were taken from.

of the holotype has sparse, dark brown or bristly black hair, usually longest along the spine and over the neck and back of the head, while the tusks and warts are conspicuous. Moreover, Groves (1997) described the species' head skin as having a black crown tuft mixed with straw-colored hairs, and no forward-directed components. The pre-ocular warts are well-developed with straw-colored gonial tufts. Recently, observations on camera trap photos of the Mindoro Warty Pig revealed a new phenotypic character between subpopulations of the species.

For this study, photos of *S. oliveri* were compiled from all camera trap surveys conducted in Occidental Mindoro, particularly in Mts. Iglit-Baco Natural Park (MIBNP), Mt. Calavite Wildlife Sanctuary (MCWS), and Aruyan-Malati (Figure 1). MIBNP and MCWS are both declared protected areas in Mindoro while Aruyan-Malati was proposed as a critical habitat under the Philippine laws. Warty pig photos in MCWS and Aruyan-Malati has been gathered from camera trap surveys conducted by the authors from 2020 to 2022. Notably, a total of 53 camera traps were installed in a ~650 ha plot in MCWS from December 2021 to May 2022 totaling 2,095 camera days, with cameras positioned at altitudes ranging 648–1,477 m. A maximum

Image 1. A—Camera trap photos of male *Sus oliveri* in MCWS with clear snout band (© MATAPAT Project) | B—two females in MCWS with clear snout band (© MATAPAT Project) | C—male in Aruyan-Malati without snout band (© DAF) | D—female in Aruyan-Malati with faint snout band (© DAF) | E—group of *S. oliveri* in MIBNP with clear snout band (© WWF Philippines).

of 20 and a minimum of 15 camera traps were deployed in Aruyan-Malati, covering a total of 894.4 ha with 140 camera placements from November 2020 to May 2022, with cameras positioned at altitudes ranging 149–590 m . The warty pig photos from MIBNP were provided by the World Wild Fund for Nature Philippines (WWF) from their camera trapping survey from 2013 to 2018. Originally, these camera trap surveys were intended to assess the distribution of medium- to large-sized mammals in all sites, particularly the 'Critically Endangered' Tamaraw *Bubalus mindorensis.*

Forty-six warty pig photos were collected with the animal presence in MIBNP, while our camera trap surveys in MCWS and Aruyan-Malati recorded 15 independent events (30 min intervals) in each site. For this study, only independent events where the facial appearance of the warty pig is observable were included. Five adult males, four adult females, two adult individuals of unknown sexes, and six juveniles were identified in MCWS. Two adult males and one adult female were identified in Aruyan-Malati. Meanwhile, eleven adults, two subadults, and four juveniles, all of the undetermined sexes, were identified in MIBNP. Based on photos, it has been observed that in both sexes, the faces of adult *S. oliveri* in MCWS and MIBNP (Image 1) are marked with a prominent whitish band in the snout. The white facial band is more conspicuous on adult individuals compared to subadults and juveniles. In contrast, this

white band is absent in the adult males (Image 1) and faint in the females of Aruyan-Malati (Image 1), which was also absent in the holotype description by Groves (1997). According to personal communications with the "amayan" (elders) and "punong balayan" (tribe leaders) of Iraya-Mangyan tribes in MCWS, there are two types of warty pigs in the protected area. As such, they call the warty pig without the white band "baboy-laon" or forest warty pig. These wild pigs are commonly found in the lower elevations of the protected area and are seldom caught in traps they put in their croplands and swidden agriculture areas. In addition, these warty pigs are very common in forested habitats with huge and longstanding trees. On the other hand, they call the warty pig with the white band "baboy-isiw" or Bamboo Warty Pig. This pig is found mostly in the higher elevations. They are less common and more elusive than "baboy-laon" as they inhabit the thick bamboo forests or forested areas in proximity to bamboo habitats.

Very little information is available on the true appearance of the Mindoro Warty Pig since only one head skin was used in describing the species. Compared to all the native *Sus* species in the Philippines, the warty pig in Visayas *S. cebifrons* is the only wild pig with a well-marked whitish band in the snout. Wherein, this white band covers the bridge on the nose and continues to follow the jawline until the angle of the jaw. Although this band is generally less pronounced in females than males, their white stripe is one of the primary distinguishing characteristic that separates this species from other wild pigs in the Philippines (Species Husbandry Guidelines 2003, unpublished) . Thus, it is interesting to note that our observations on some *S. oliveri* individuals from camera trap photos found that this species also has a well-marked facial band. Unlike the white stripe in *S. cebifrons*, the white band of *S. oliveri* extends only from the bridge of the snout up to the end of the mouth and does not continue to cover the angle of the jaw. Moreover, it is also important to note that the holotype descriptions by Groves (1997) appear to be similar to the warty pig of Aruyan-Malati (low elevation) but the warty pigs photographed in MIBNP and MCWS (medium to high elevation) resemble more that of *S. cebifrons*.

The study has observed two distinct forms of *S. oliveri*, one variation matches the original holotypic descriptions while the other shows a prominent white snout-band. This difference can occur between the lowland and highland populations of the animals within Occidental Mindoro, as qualitative information through occasional interviews with local communities indicates, but further research is needed to verify this aspect. These different highland and lowland forms have been verified by the local communities but further research is needed to determine their degree of distinctiveness. In the case of MCWS, this difference likely indicates some kind of isolation between the two morphologies, either physical, behavioral, or reproductive. Although insights from indigenous people affirm that the two forms of *S. oliveri* are morphologically and ecologically distinct from each other, it is difficult to conclude the origin of these differences. Whether they are separate species, they have different adaptations to their environment, or some of their subpopulations are experiencing intense hybridization is currently unknown. The possibility of hybridization between *S. oliveri* and *S. scrofa* may also be considered, particularly in the lowlands and community forests where interbreeding between the two species is likely to occur (Oliver et al. 1995), and such may be the case in the warty pigs of Aruyan-Malati as they are both from lowland areas. Therefore, investigation of genotypes between the two distinct forms should be done to identify the origin of such phenotypic differences. Such efforts should also investigate the rate of introgression with *S. scrofa* to determine the genetic integrity of the species. This also calls for genetic studies to investigate the relationship of *S. oliveri* with other Philippine *Sus* species in order to construct a comprehensive evolutionary history. Overall, the above-mentioned recommendations will aid decision-makers in appropriately assessing the status of *S. oliveri* and formulating appropriate conservation strategies for the species.

References

Heaney, L.R., D.S. Balete, M.L. Dolar & P.S. Ong (1998). A synopsis of the mammalian fauna of the Philippine Islands. *Fieldiana Zoology* 88: 1–61.

Groves, C.P. (1997). Taxonomy of wild pigs (*Sus*) of the Philippines. *Zoological Journal of the Linnean Society* 120: 163–191. https://doi.org/10.1111/j.1096-3642.1997.tb01277.x

Groves, C.P. (2001). Taxonomy of wild pigs of southeast Asia. *IUCN/SSC Pigs, Peccaries, and Hippos Specialist Group (PPHSG) Newsletter* 1(1): 3–4.

Schütz, E. (2016). *Sus oliveri*. The IUCN Red List of Threatened Species : e.T136340A44142784. https://doi.org/10.2305/IUCN.UK.2016-2.RLTS.T136340A44142784.en. Accessed on 06 September 2023.

Meijaard, E., J.P. D'huart & W.L.R. Oliver (2011). *Family Suidae* (pigs), pp 248–291. In: Wilson, D. E. & R.A. Mittermeier (eds.). *Handbook of the Mammals of the World, Volume 2, Hoofed Mammals*. Lynx Edicions, Barcelona.

Species Husbandry Guidelines (2003). Visayan Warty Pig (*Sus cebifrons*). Philippines Biodiversity Conservation Programmes. Unpublished.

Oliver, W.L.R. (1995). The taxonomy, distribution and status of Philippine wild pigs. *Ibex, Journal of Mountain Ecology* 3: 26–32.

Journal of Threatened Taxa is indexed/abstracted in Bibliography of Systematic Mycology, Biological Abstracts, BIOSIS Previews, CAB Abstracts, EBSCO, Google Scholar, Index Copernicus, Index Fungorum, JournalSeek, National Academy of Agricultural Sciences, NewJour, OCLC WorldCat, SCOPUS, Stanford University Libraries, Virtual Library of Biology, Zoological Records.

NAAS rating (India) 5.64

Print copies of the Journal are available at cost. Write to:
The Managing Editor, JoTT,
c/o Wildlife Information Liaison Development Society,
3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore,
Tamil Nadu 641006, India
ravi@threatenedtaxa.org & ravi@zooreach.org

Journal of Threatened Taxa

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

November 2024 | Vol. 16 | No. 11 | Pages: 26063–26186
Date of Publication: 26 November 2024 (Online & Print)
DOI: 10.11609/jott.2024.16.11.26063-26186

Publisher & Host

WILD zoOreach
Zoo Outreach Organisation

Threatened Taxa