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Zoologia Caboverdiana é uma revista científica com arbitragem científica (*peer-review*) e de acesso livre. Nela são publicados artigos de investigação original, artigos de síntese e notas breves sobre Zoologia, Paleontologia, Biogeografia, Etnozoologia e Conservação nas ilhas de Cabo Verde. Também publicamos artigos originais ou de revisão de uma área geográfica mais ampla desde que debruçados sobre espécies que ocorrem no arquipélago de Cabo Verde.

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Nota editorial

A passos largos

A produção do conhecimento científico a partir de parcerias entre autores nacionais e estrangeiros têm vindo a ser evidenciado como a chave para o crescimento científico dos investigadores cabo-verdianos. Estes têm vindo a dar passos largos na liderança de estudos ligados a diversas áreas das ciências biológicas, muitos deles conduzidos por mulheres, resultando em publicações de altíssima qualidade. É neste contexto que apresentamos o presente número da *Zoologia Caboverdiana*, que incluí três artigos frutos de parcerias multinacionais, todos encabeçados por autores nacionais, sendo dois deles mulheres.

A primeira publicação intitula-se "*Padrões de emergência e sucesso de sobrevivência de neonatos de tartarugas marinhas na praia*". Os autores deste artigo analisaram a emergência e sobrevivência de neonatos de tartarugas marinhas *Caretta caretta* na praia por meio de censos matinais de rastros de neonatos, tendo como modelo a praia de João Barrosa da ilha da Boavista. Os resultados demostraram que mais de metade dos neonatos de tartarugas, que emergiam diariamente, morreram após eclodirem do ninho. O estudo conclui que as variáveis associadas a esse fenômeno incluem a predação pelos caranguejos fantasmas *Ocypode cursor*, a distância em relação à linha da maré, o local onde a tartaruga faz o ninho, bem como a fase da lua no dia em que os neonatos eclodem.

A segunda publicação é uma breve nota intitulado "*Dentes de* Otodus megalodon *(Lamniformes: Otodontidae) de Cabo Verde, Atlântico oriental*". Neste trabalho, os autores documentam pela primeira vez a presença de *Otodus megalodon* nas águas territoriais de Cabo Verde, com base em dentes encontrados em rochas de duas localidades e épocas diferentes: na Baía dos Barreiros, São Nicolau, em Abril de 2013 e outro na Fazenda, Santiago, em Janeiro de 2023. Apesar de já ter sido sugerida a possibilidade do *O. megalodon* ter passado em Cabo Verde, as espécies de dentes apresentados neste estudo confirmam esse feito.

A terceira publicação é uma nota breve que reporta, pela primeira vez, a presença da espécie *Hemidactylus mabouia* na ilha do Sal. As autoras da nota " *Primeiro registo da osga doméstica* H. mabouia *para a ilha do Sal, Cabo Verde*", destacam que a espécie que foi introduzida em Santo Antão, Brava e São Vicente está alargando a área de distribuição devido à mediação humana. A metodologia adotada baseou-se em transectos nocturnos e diurnos, com a confirmação da taxonomia dos espécimes por meio de análise de ADN. Os resultados demostraram que a introdução do *H. mabouia* na ilha do Sal é recente, o que reforça a necessidade de implementar medidas para evitar a expansão dessa espécie entre as ilhas, assegurando assim a protecção das espécies endémicas que possam ser impactadas por esse invasor.

Assim sendo, em nome do Comité Editorial desejo a todos uma agradável leitura e que apreciem este número.

Evandro Lopes
Editor-chefe interino da *Zoologia Caboverdiana*

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Editorial Note

In great strides

The production of scientific knowledge through partnerships between national and foreign authors has been highlighted as the key to the scientific growth of Cabo-verdean researchers. They have been taking great strides in leading studies in various areas of biological sciences, many of which are led by women, resulting in publications of very high quality. It is in this context that we present the current issue of Zoologia Caboverdiana, which includes three articles resulting from multinational partnerships, all headed by national authors, two of whom are women.

The first publication is entitled "Emergency Patterns and Survival Success of Neonate Sea Turtles on the Beach." The authors of this article analyzed the emergence and survival of neonate loggerhead sea turtles (*Caretta caretta*) on the beach through morning censuses of hatchling tracks, using João Barrosa beach on Boavista Island as a model. The results showed that more than half of the turtle hatchlings that emerged daily died after hatching from the nest. The study concludes that variables associated with this phenomenon include predation by ghost crabs (*Ocypode cursor*), the distance from the tide line, the nesting location of the turtle, as well as the moon phase on the day the neonates hatch.

The second publication is a short note entitled "*Teeth of* Otodus megalodon *(Lamniformes: Otodontidae) from Cabo Verde, eastern Atlantic*". In this work, the authors document for the first time the presence of *Otodus megalodon* in the territorial waters of Cabo Verde, based on the teeth found in rocks from two different locations and times: in Baía dos Barreiros, São Nicolau, in April 2013, and another in Fazenda, Santiago, in January 2023. Although the possibility of *O. megalodon* having passed through Cabo Verde had been suggested before, the species of teeth presented in this study confirm this occurrence.

The third publication is a short note that reports, for the first time, the presence of the species *Hemidactylus mabouia* on the island of Sal. The authors of the note "*First record of the house gecko* H. mabouia *for the island of Sal, Cabo Verde*" highlight that the species, which was introduced in Santo Antão, Brava, and São Vicente, is expanding its distribution area due to human mediation. The adopted methodology was based on nocturnal and diurnal transects, with the confirmation of specimen taxonomy through DNA analysis. The results demonstrated that the introduction of *H. mabouia* on the island of Sal is recent, reinforcing the need to implement measures to prevent the spread of this species among the islands, thus ensuring the protection of endemic species that may be impacted by this invader.

Therefore, on behalf of the Editorial Committee, I wish everyone an enjoyable reading and hope you appreciate this issue.

Evandro Lopes
Interim Editor-in-chief of *Zoologia Caboverdiana*

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Artigo original | Original article

Emergence patterns and survival success of sea turtle hatchlings on the beach

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RESUMO

Conhecimentos sobre a sobrevivência de neonatos de tartarugas são essenciais para o desenvolvimento de medidas que aumentam a sobrevivência das mesmas nas praias. O presente estudo foi desenvolvido com o propósito de analisar a emergência e sobrevivência de neonatos de tartarugas marinhas, tendo a praia de João Barrosa da ilha de Boavista como modelo. Para o estudo foram efectuados censos matinais de rastros de neonatos de tartarugas, neonatos de tartarugas mortas e ninhos eclodidos usando dois transectos lineares na linha da maré alta. Os dados demostraram que mais de metade dos neonatos de tartarugas emergidos diariamente morreram. Foi observado que o local dos transectos exercem influência na sobrevivência de neonatos de tartarugas. A fase lunar também exerce influência na sobrevivência de neonatos de tartarugas na zona supralitoral, sendo maior nas noites de lua nova. Por último, os resultados demostraram que a sobrevivência de neonatos de tartarugas diminui com o aumento da distância do ninho à linha de maré alta. São propostas medidas de conservação e recomendações para aumentar a sobrevivência de neonatos de tartarugas nas praias.

Palavras-chave: Caranguejo fantasma, *Caretta caretta*, conservação, predação, tartarugas recém-nascidas

ABSTRACT

Knowledge about the survival of turtle neonates is essential for developing measures to increase turtle survival on breeding beaches. The present study was developed to analyse the emergence and survival of marine turtle neonates, using João Barrosa beach on Boavista Island as a model. For this study, morning censuses of neonate tracks, dead neonates and emerged nests were performed using two linear transects at the high tide line. The data showed that more than half of the daily emerged neonates died. It was determined that the location of the nests influences the neonate's survival. The lunar phase also influences the survival of the neonate turtles in the supralittoral zone, being greater on new moon nights. Finally, the results showed that neonate survival decreases with increasing distance from the nest to the high tide line. Conservation measures and recommendations to increase the survival of neonates on nesting beaches are proposed.

Keywords: ghost crabs, *Caretta caretta*, conservation, predation, turtle hatchlings

INTRODUCTION

Sea turtles are critical to the balance of marine ecosystems (Reis & Goldberg 2017), but they are threatened with extinction due to human and natural threats (Mrosovsky 1983), such as predation of eggs and hatchlings (Correia *et al*. 2016).

Ghost crabs are among the most important predators of turtle hatchlings (Erb & Wyneken 2019; Marco *et al*. 2015). Since the activity of ghost crabs coincides with the emergence period of turtles (Lucrezi & Schlacher 2014), they significantly affect their survival during the incubation and emergence process (Martins *et al*. 2021). Because potential prey will be more exposed to predators, lunar luminosity on the beach is related to the degree of hatchling predation (Silva *et al*. 2017). According to some studies, this factor influences the activity of ghost crabs, causing them to be more active on lighter nights/ full moon and less active on darker nights/ new moon (Fortaleza *et al*. 2020).

After 50–60 days of incubation (Demmer 1981), turtle neonates emerge from the nest at night (Glenn 1996) and crawl towards the sea. Their survival depends on several factors (Triessnig *et al*. 2012), such as the distance of nest emergence from the seashore, thus influencing hatchling survival (Erb & Wyneken 2019). The further away from the seashore emergence occurs, the more time a hatchling spends on the beach exposed to predators (Marschhauser 2010), while the risk of disorientation also increases. In addition, the presence of obstacles (marine debris, rocks, vegetation) on beaches, can make the crawl towards the sea more difficult and thus decrease the chance of survival (Aguilera *et al*. 2018a).

A better understanding of the factors influencing the survival of hatchlings would be useful for developing strategies that increase the survival success of neonates on beaches and support the conservation of sea turtles that are threatened with extinction.

This study was developed to analyse the emergence of hatchlings and the factors influencing their survival and to obtain useful information to assist in conservation programs of sea turtles.

MATERIAL AND METHODS

The study was carried out at João Barrosa beach (16°01'N, 22°45'W) within the Turtle Nature Reserve on the southeast coast of Boavista Island, Cabo Verde (Fig. 1). Cabo Verde is considered one of the most important nesting locations for the loggerhead turtle *Caretta caretta* (Marco *et al.* 2011). Boavista hosts more than 65% of the nesting sites in the archipelago (Ferreira-Veiga 2018), while João Barrosa beach hosts 20% of sea turtles nesting on the island (Marco *et al.* 2012). The field study took place between September 18 and October 11, 2021, which is an important period for the emergence of neonates in the archipelago (Marco *et al*. 2011).

Two linear transects at high-tide lines were defined using a *Garmin Etrex 10 GPS* device: transect T1 (16º00´53´´N, 22º44´32´´W), with white sand without stones and 180 m in length, and transect T2 (16º00´58´´N, 22º44´24´´W), with white sand and abundant stones, 280 m in length (Fig. 1).

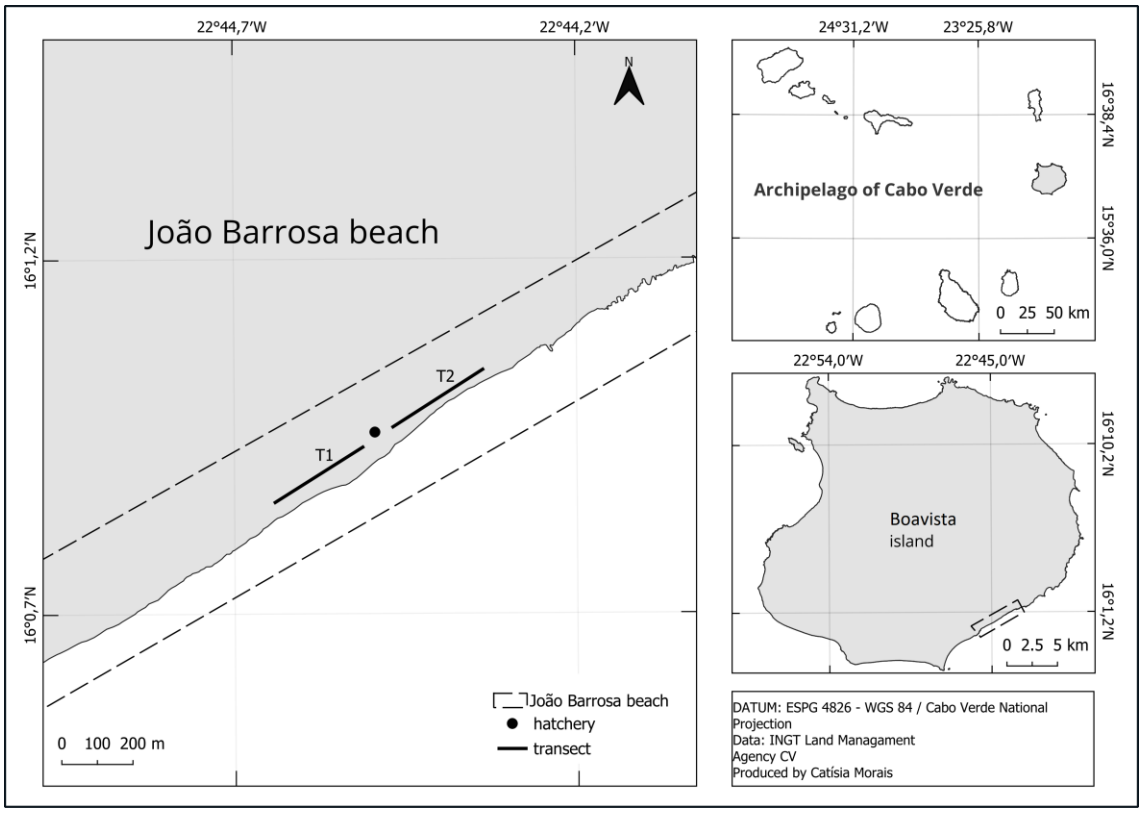

Fig. 1. Study area and study site. Map of Cabo Verde, highlighting Boavista Island and the selected beach of João Barrosa on the southeast coast of the island and the two transects (T1 and T2).

Morning censuses were conducted on each transect recording the following information: number of emerged nests, emergence tracks, tracks of neonates that entered the intertidal zone and dead neonates that were up to 2 m from the linear transect. Each track of neonates found in the transect was followed to find the nest location which was marked by a heap of stones and a number. For each detected emerged nest, the distance of the nest from the high tide line was measured and the emergence tracks were counted. All dead hatchlings found were counted, evaluated to see if it was preyed upon or not and then buried. Hatchling survival success only refers to the supralittoral zone. It was not possible to estimate survival in the intertidal zone. The density (D) of each variable was calculated, because the transect hasn't the same length, and the unit of measurement was "per meter of the beach":

D= Q/C (Q= daily quantity; C= length of the corresponding transect) and emergence success= daily emergence/ daily nest.

Parametric tests were performed, using the densities of variables that followed a normal distribution and that were homogeneous, while nonparametric tests were done for those that did not follow a normal distribution or were not homogeneous. Spearman correlation tests were performed to compare quantitative variables. These parametric tests served to compare the means between the locations of the transects and between the lunar phases (new moon, full moon and waning moon) (cf. https://www.vercalendario.info/pt/lua/cabo-verde).

RESULTS

The observed emergence success was 13.05 neonates per nest (Table 1). On two transects, the mean of neonates that survived in the supralittoral zone each night was 80.9±59.8, but more than half of the emerged neonates (82.0±58.8) died on the beach (56.3±29.3).

Transect T1 had the highest density of dead neonates per meter of beach (0.359±0.12), while transect T2 had the lowest density (0.158±0.11; Table 2). In transect T1 there were more emergences per meter of beach than in transect T2 (0.379 ± 0.26; 0.328 ± 0.22). The location of the transects significantly influenced the density of dead neonates (Student's t-test= 4.122, p< 0.05).

Table 1. Daily mean, standard deviation (SD) and the total number of neonates counted (N) of each variable in two transects (T1 and T2). Sample size (n= 21 days)

Study variables	Mean ± SD	N
Emergency tracks	82.00 ± 58.8	1720
Emerged nests	6.28 ± 4.0	132
Surviving neonates in the supralittoral zone	80.90 ± 59.8	1699
Dead neonates	56.38 ± 29.3	1184

Table 2. Daily density and standard deviation (SD) per meter of beach and SD of each variable in each transect (T1 and T2). Sample size (n= 21 days)

Study variables	Density ± SD (180m)	Density ± SD (280m)
Emergency tracks	0.379 ± 0.26	0.328 ± 0.22
Emerged nests	0.029 ± 0.02	0.025 ± 0.01
Surviving neonates in the supralittoral zone	0.351 ± 0.24	0.336 ± 0.22
Dead neonates	0.359 ± 0.12	0.158 ± 0.11

Regarding the influence of lunar phases, it was found that the differences in the mean density of dead hatchlings are statistically significant (ANOVA: F= 5.245, p= 0,016) for the different lunar phases, as well as for the variable's densities of surviving neonate tracks and density of hatched nests (Kruskal-Wallis: $p< 0.05$). The highest densities of dead neonates (mean± SD = 0.375± 0.11), tracks of surviving neonates in the supralittoral zone (mean± SD= 0.557± 0.28), emergence tracks (mean± SD= 0.558± 0.27) and emerged nests (mean± SD= 0.039± 0.01) were found during the new moon, while full moon had the lowest densities of dead neonates (mean± SD= 0.174± 0.14), surviving hatchling tracks (mean± SD=

0.232± 0.13), emergence tracks (mean± SD= 0.201± 0.12) and emerged nests (mean± SD= 0.017± 0.00) (Fig. 2). The differences in the variable density of tracks of non-surviving neonates were not statistically significant (Kruskal-Wallis: $p< 0.05$), meaning that the lunar phases only influence the variable densities of dead hatchlings, tracks of surviving neonates, emergency tracks and hatched nests.

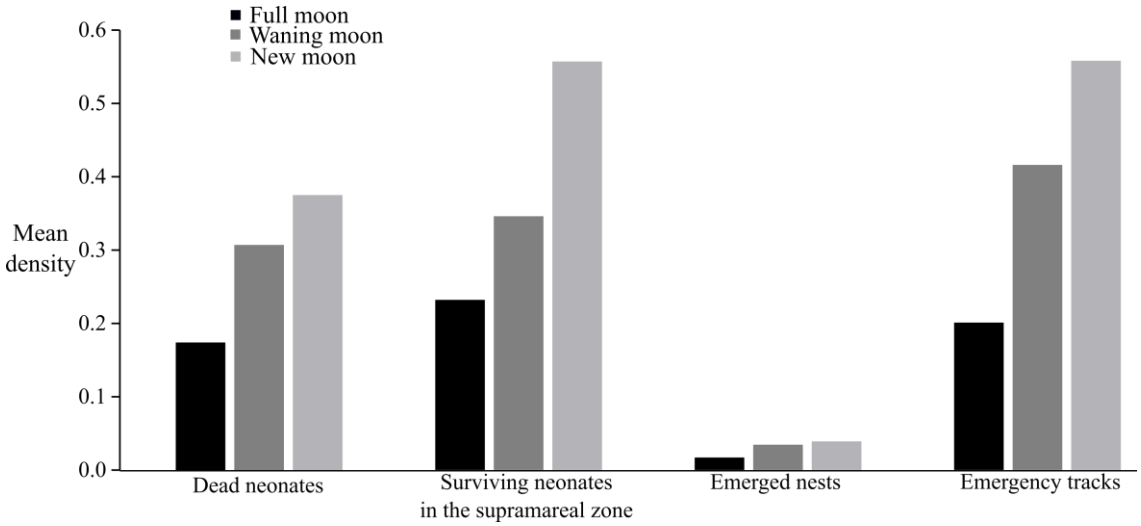

Fig. 2. Average densities of dead neonates, tracks of surviving neonates in the supralittoral zone, emergency tracks and emerged nests per meter from the beach in the three lunar phases.

The distance from the nest to the high-tide line was negatively correlated with the density of surviving neonate tracks (Spearman correlation: r= -0.238, p< 0.05), which means that when the distance from the nest to the high-tide line increases, the density of surviving hatchling tracks decreases.

DISCUSSION

In this study, it was not possible to discern the survival of neonates on the entire João Barrosa beach. This parameter was only evaluated for the supralittoral zone, as it was hard – indeed well-nigh impossible – to count tracks in the intertidal zone. Also, it was not possible to know the total number of dead neonates, because these were only counted along the transects. But as 68.6% of emerged neonates were found dead, 31.3 % may have survived or were washed away by the waves, displaced by ghost crabs or lost in another way. However, the results clearly show that the survival of turtles on the beach is low because most of the emerged hatchlings apparently perish before reaching the sea.

All dead neonates found showed signs of predation, e.g., a missing head or viscera could indicate ghost crabs being the predator as only ghost crab tracks were found in the study area. However, other predators recorded at João Barrosa beach include corvids and rats (Marco *et al*. 2011). The location of the nests influenced the density of dead neonates, this being higher in the T1 transect. This may be due to the characteristics of the nest location (Bourgeois *et al*. 2009), as T1 site had many stones. It also had a higher density of nests and consequently a higher number of emerged neonates and a higher rate of mortality. However, analyzing the different values, it appears that the daily density of emerged

neonates in the two transects is the same, but the daily density of dead neonates is very different, showing that in transect T1 almost all the emerged neonates died (94.7 %) and in transect T2 only half died (48.1 %), so in this case the location of the nests clearly influenced the survival rate of neonates.

Hatchling survival in the supralittoral zone was lower during the full moon/ light night and higher during the new moon/ dark night. The fact that ghost crabs are restricted to the intertidal zone during the night (Fortaleza *et al*. 2020) and less active during low light nights (Silva *et al.* 2017), increased neonate survival in the supralittoral zone during the new moon/ low light. During the full moon, however, ghost crabs are more active and more neonates die because upon arrival in the intertidal zone, most were preyed upon due to the high density of ghost crabs in the area (Rodrigues *et al*. 2016). So, even if the density of dead neonates during the new moon is higher than during the full moon, 86% of emerged neonates died on full moon, while with new moon 67.2% died. In other words, during new moon, there are more surviving neonates in the supralittoral zone, but more dead neonates during full moon.

As the distance from the nest to the high-tide line increases, the survival of neonates decreases. However, a previous study conducted in Boavista concluded that the distance from the nest was not correlated with the predation rate of neonates (Martins *et al*. 2021) and predation was higher in the intertidal zone as this was where the highest density of ghost crabs is found (Strachan *et al*. 1999). However, the survival of neonates in the present study represents those that arrived in the intertidal zone, while Aguilera *et al*. (2018b) found that staying on the beach increased the chances of predation.

CONCLUDING REMARKS

The data obtained in this study will hopefully serve to improve the quality of information about sea turtles in Cabo Verde and help in the development of strategies to increase the survival of neonates on spawning beaches. One possibility would be to perform night patrols, looking for hatchling emergences and taking them closer to the water. These patrols could be concentrated on the darkest and lightest nights because this study demonstrated that these factors influence the survival of neonates during their stride towards the sea.

We recommend carrying out further studies during the hatching season in Cabo Verde, especially those focusing on the danger zones, i.e., the intertidal zone where predation is higher. Additionally, studies on ghost crab behavior are desirable, to better understand the relationship with neonate turtles. Continued implementation of the sea turtle conservation program, the registration and morning monitoring of emergence tracks on the important spawning beaches are recommended. Since Cabo Verde has a high density of nests, it would be an ideal study location to closely follow emergences of nests

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Nota breve | Short note

On teeth of *Otodus megalodon* (Lamniformes: Otodontidae) from Cabo Verde, eastern Atlantic

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Keywords: Cabo Verde, megatooth shark, new records

The megatooth shark *Otodus megalodon* is one of the most emblematic fossil vertebrates. Its massive teeth, several times larger than those of the largest living sharks, have been recovered from middle Miocene (~13 Ma) to Pliocene formations worldwide (Cappetta 2012, Pimiento *et al.* 2016). The youngest reliable records of *O. megalodon* are early Pliocene (Zanclean), suggesting an extinction at the early/late Pliocene boundary (~3.6 Ma) (Boessenecker *et al.* 2019). With adults reaching over 15 m (possibly up to 20 m, cf. Perez *et al.* 2021) in length and weighting more than 50 tons, *O. megalodon* is thought to have been an apex predator of marine mammals and one of the largest carnivorous animals in the history of Earth (Pimiento & Balk 2015, Shimada 2019, Cooper *et al.* 2020).

Within the eastern Atlantic islands, *O. megalodon* teeth have been reported from the Azores (Avíla *et al.* 2012), the Canary Islands (Betancort *et al.* 2016) and Cabo Verde (Serralheiro 1970, 1976). However, whereas specimens from the Azores and Canary Islands were fully documented, those from Cabo Verde were merely mentioned in passing within the context of geological studies.

During a field trip to Baía dos Barreiros, in the eastern part of the island of São Nicolau, Cabo Verde, in April 2013, Pedro A. Bicudo and JJC found a large shark tooth, apparently eroded from the adjacent limestone beds. Although abraded, it clearly represented a tooth of *O. megalodon* (Fig. 1A). These carbonate deposits crop out near the base of sea cliffs for 2.5 km from Baía dos Barreiros eastwards, constituting a four to five meter evenly thick band (Fig. 1B & C). Based on scant fossil content, Johnson *et al.* (2014) dated these beds as Messinian (late Miocene; 7.2-5.3 Ma). The tooth was deposited at the Museu da Pesca at Tarrafal, São Nicolau, Cabo Verde, where it is registered under collection number DOA/003/1023. In January 2023, another megalodon tooth was found at Fazenda, north of Tarrafal, on the island of Santiago (Fig. 1D).

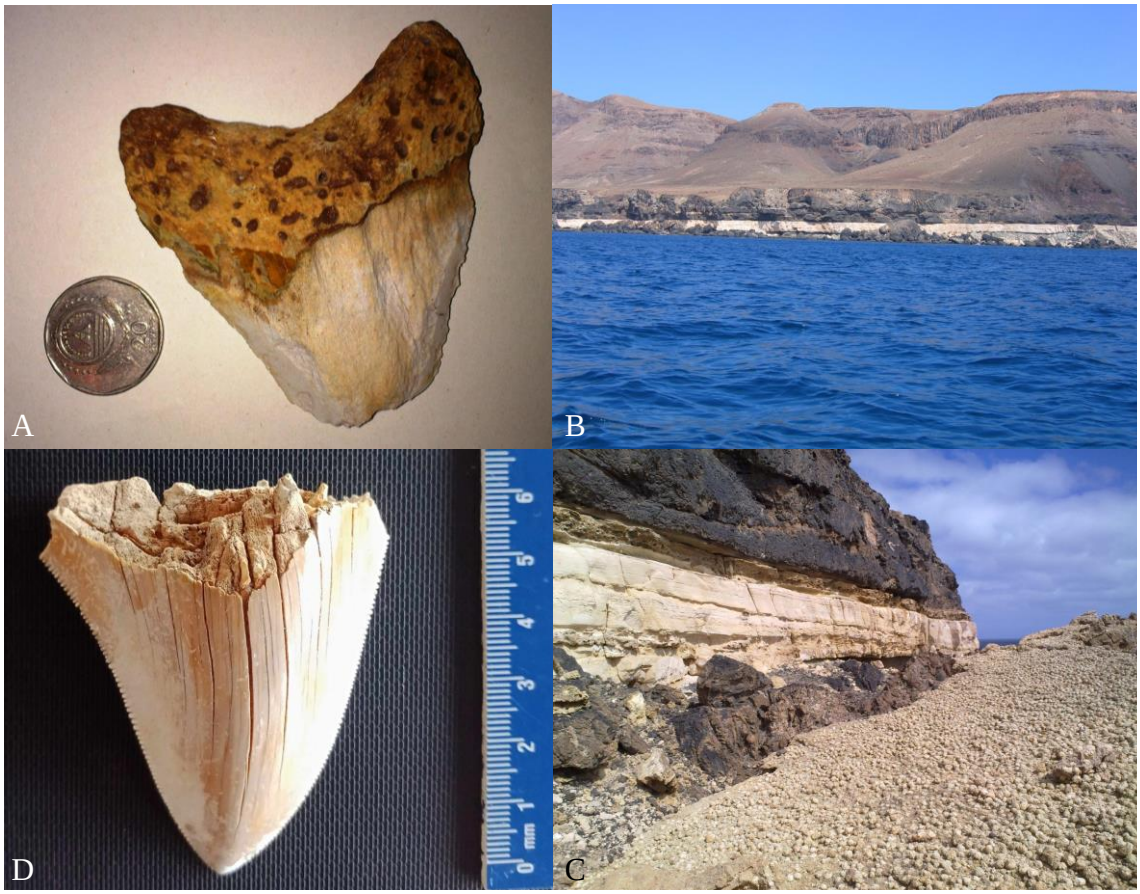

Fig. 1. A) Lingual view of Otodus megalodon tooth collected at Baía dos Barreiros, São Nicolau, Cabo Verde; Ø coin = 2.5 cm. (photo by Pedro A. Bicudo); **B)** The limestone bed (whitish band) at Baía dos Barreiros, São Nicolau, as seen from the sea (photo by José J. Cabral); **C)** A closer view of the limestone bed at Baía dos Barreiros, São Nicolau, from which the megalodon tooth eroded, with accumulation of rhodoliths in front (photo by José J. Cabral); **D)** Lingual view of *Otodus megalodon* tooth collected at Fazenda, Santiago, Cabo Verde (photo by Osvaldo Semedo).

Serralheiro (1970, 1976) mentioned two *O. megalodon* teeth from deposits just south of Porto Inglês on the island of Maio and another one from deposits near Ponta Preta, in the north of the island of Santiago, without, however, providing further details. Although Serralheiro (1970, 1976) stated that specimens had been collected, we have been unable to trace these teeth in any of the institutional geological or paleontological repositories in Lisbon. The specimens reported herein constitute the first fully documented *O. megalodon* teeth from Cabo Verde.

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Nota breve | Short note

First record of the house gecko *Hemidactylus mabouia* for the island of Sal, Cabo Verde

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Keywords: conservation, distribution, genetic, invasive species, reptile

Invasive species have been found to disrupt relationships between endemic species by, for instance, competition for resources, predation, and transmission of diseases, and reptiles are among the most affected groups (Ruiz *et al.* 2003). Island endemics, due to their restricted distributions and naive behavior, usually have increased risks of extinction due to invasives (Gaiotto *et al.* 2020). In Cabo Verde Islands, two reptile species have already gone extinct partly due to invasives (Pinho *et al.* 2022). The house gecko *Hemidactylus mabouia* is introduced to Cabo Verde which has greatly increased its range during the last century due to human mediation (Carranza & Arnaldo 2006). It is one of the most effective invaders of its genus and should be closely monitored to ensure that it does not expand its range or displace native species as *Hemidactylus angulatus*, also introduced to Cabo Verde, is doing with the native *Hemidactylus boavistensis* (Vasconcelos *et al*. 2013).

To sample reptiles, during day and night, two 300 m-transects were carried out by two observers during the dry season, from 19 to 20 April 2023, in the central-eastern part of Sal (16.70209º N, 22.90129º W). Animals were searched for under rocks by day and on the ground using head lamps when active by night. For each individual found, a code was assigned, the location and time of capture were GPS-recorded, a tail tissue was collected, and digital photographs were taken. DNA was extracted from the tail tissue using the saline method and amplified using the universal 12S primers. Amplification (PCR) included an initial activation step (95º for 15 min), followed by 35 cycles of denaturation (30 s at 95ºC), annealing (30 s at 55ºC), extension (45 s at 72ºC) and final extension (10 min at 60ºC). The amplified

products were sequenced in an automatic sequencer (AB3500XL, Applied Biosystems) and made available in GenBank (OR838827).

Three adults (males and females; Fig. 1), one juvenile, and several putative *H. mabouia* eggs were found. Pictures of the diagnostic morphological characters and the genetic sequence (identical to OQ267597 GenBank sequence) confirmed they belong to that species.

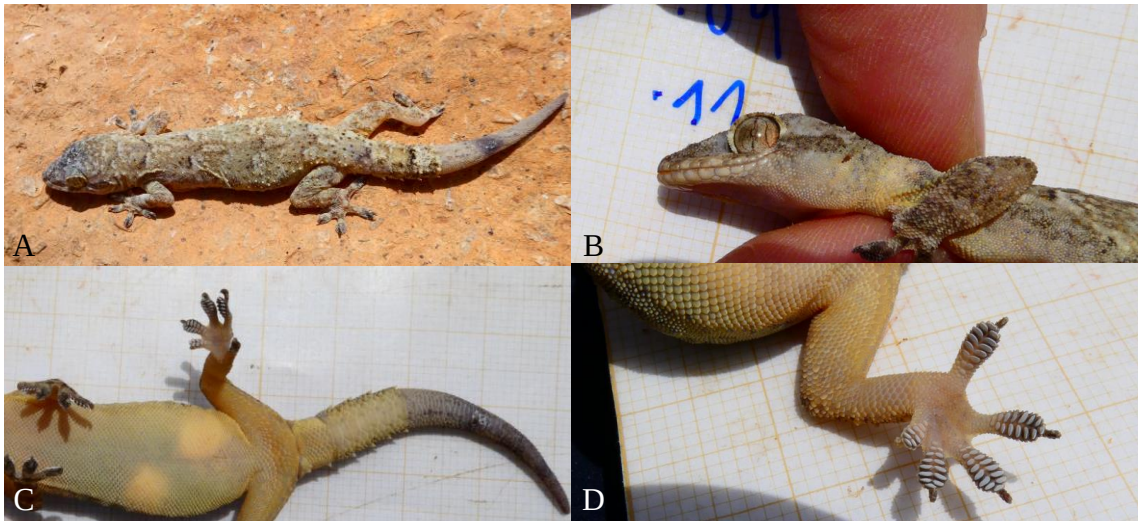

Fig. 1. *Hemidactylus mabouia* recorded on the island of Sal in April 2023 (photos by R. Vasconcelos). **A)** Dorsal view with the typical spiny tubercles and wavy crossbars from neck to tail. **B)** Lateral view. **C)** Ventral view of ovate female confirming reproduction of the species. **D)** Detail of the fingers with divided lamellae and long five claws, a diagnostic character of this genus.

Before this work, the distribution of *H. mabouia* in Cabo Verde was confirmed only on three islands: Santo Antão, Brava, and São Vicente (Vasconcelos *et al*. 2013). This herpetofauna monitoring confirmed its presence on Sal for the first time, showing that the species is still expanding its range in the archipelago. These specimens showed to have the same haplotype as those found on other islands, indicating a recent introduction (Pinho *et al*. 2023).

More studies on the effects of the presence of this species on the archipelago are needed, and measures to prevent the expansion of *Hemidactylus* among the islands should be implemented (e.g., control of boats and plain cargo), to ensure the protection of endemic species (Vasconcelos *et al*. 2020).

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Capa | Front cover

Caranguejo fantasma (*Ocypode cursor*) com cria de tartaruga *Caretta caretta* na Praia de João Barrosa, Ilha da Boavista, 12 de setembro de 2014| The tufted ghost crab (*Ocypode cursor*) with juvenile turtle *Caretta caretta* on João Barrosa Beach, Boavista Island, 12 September 2014 (fotografia de | photo by Joan Costa).

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