https://doi.org/10.5852/ejt.2025.997.2927
www.europeanjournaloftaxonomy.eu
2025 · Cazanove G. *et al.*

Research article

urn:lsid:zoobank.org:pub:382A6244-6542-4D44-969A-F073A2BC3A58

Testing species boundaries of an unknown *Dolomedes* (Araneae, Dolomedidae) morphospecies from isolated islands

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Abstract. Raft spiders, family Dolomedidae, represent a group of spiders with 7 genera distributed near globally well known for a semi-aquatic lifestyle. One of the iconic genera representing such a unique lifestyle is the largest and diverse dolomedid genus *Dolomedes*. Although *Dolomedes* is well surveyed in parts of its distribution, its diversity in the tropics remains largely unknown, such as the western Indian Ocean region with most of the islands unsurveyed. Recent expeditions to Madagascar and La Réunion Island discovered a series of specimens that appear to belong to an unknown morphospecies of *Dolomedes*, exhibiting varying degrees of differences in the diagnostic characteristics. To further test and define their species boundaries, we include molecular evidence followed by species delimitation analyses. Our findings indicate that specimens from both islands are conspecific. Consequently, we introduce a new species to science, *Dolomedes reuniascar* sp. nov., providing detailed illustrations, descriptions of its variations and ecological characteristics. Based on our observations and existing literature, we speculate that the presence of this species on the two isolated islands could be attributed to either highly efficient dispersal abilities, such as ballooning of spiderlings, or human-mediated introduction events.

Keywords. Fishing spider, Madagascar, phylogeny, Réunion, taxonomy.

Cazanove G., Yu K.-P., Derepas B. & Henrard A. 2025. Testing species boundaries of an unknow *Dolomedes* (Araneae, Dolomedidae) morphospecies from isolated islands. *European journal of taxonomy* 997: 99–130.
https://doi.org/10.5852/ejt.2025.997.2927

Introduction

The spider family Dolomedidae Simon, 1876 includes 127 species in 7 genera distributed near globally (WSC 2025). Commonly known as raft or fishing spiders, most dolomedids inhabit near water and are well known for their semi-aquatic lifestyles. An iconic representative of the family is the fishing spider genus *Dolomedes*, a group of mid to large-sized wandering spiders inhabiting all kinds of freshwater-associated habitats (Sierwald 1997; Zhang *et al.* 2004). *Dolomedes* species are well known for their aquatic locomotion (Vink & Duperré 2010) as well as their ability to prey on fish and amphibians in addition to invertebrates (Carico 1973; Nyffeler & Pusey 2014; Raven & Hebron 2018). *Dolomedes* is the largest dolomedid genus with 105 known species distributed globally (WSC 2025). The genus contains prevalent species but also endemic species found only on isolated land masses, such as Okinawa islands (Tanikawa 2003), New Zealand (Vink & Dupérré 2010), New Caledonia (Raven & Hebron 2018), and Sumatra (Hasselt 1882; Strand 1906). Despite being well surveyed in parts of its distribution, our knowledge of *Dolomedes* diversity in the tropics, such as western Indian Ocean islands, is still limited.

To date, Madagascar is the only western Indian Ocean island with formal records of *Dolomedes*. Discovery of *Dolomedes* on Madagascar can be traced back to when Strand (1907) first described *D. saccalavus* Strand, 1907 from Nosy Be (Nossibé). However, the species is treated as nomen dubium since the holotype, a juvenile specimen, is considered lost (Silva & Griswold 2013). In the same study, Silva and Griswold (2013) described two males of *D. kalanoro* Silva & Griswold, 2013, collected from the south and the west of the island. A recent study by Yu & Kuntner (2024) reports four new species from the humid forests in the north and the east of the island, raising the list of known *Dolomedes* species on Madagascar from one to five.

Aside from Madagascar, Casquet (2011) and Cazanove (2022) recorded an unknown *Dolomedes* species in their checklist of spiders of La Réunion. However, the species has not been formally described. Unlike Madagascar, which was part of the historical Gondwana landmass and has undergone isolation for more than 80 million years (see Sanmartín & Ronquist 2004; Ali & Aitchison 2008), La Réunion is the youngest island of the Mascarene Islands: it is 2–3 million years old and has never been connected to any major continents. Despite being young, the extreme isolation of around 700 km of ocean from Madagascar has created high rates of endemicity on La Réunion Island with an estimated 14–25% of the total spider species found nowhere else in the world (Ledoux 2004, 2007, pers. comm. 2013; Cazanove 2022).

Contrary to our knowledge of spider endemism between Madagascar and La Réunion, Yu and colleagues collected from Madagascar, in 2022, a morphospecies of *Dolomedes* that shared striking similarities with that found in La Réunion, from a morphological point of view. However, like many other cases in *Dolomedes* (Tanikawa & Miyashita 2008; Vink & Duperré 2010; Yu & Kuntner 2024), defining the species boundaries among the specimens from the two islands has proven difficult. We observed certain degrees of variation in the commonly used diagnostic characteristics, especially in the male retrolateral tibial apophysis. Therefore, we aim to apply an integrative approach including molecular evidence to strengthen the species boundaries and to determine whether the specimens from Madagascar and La Réunion Island are conspecific.

Material and methods

Our integrative approach was based on the unified species concept (De Queiroz 2005, 2007). The collected specimens were first classified using morphological characteristics. We then tested the hypothesized classification using the molecular data (morphology-first, see Hedin & Milne 2023; Yu & Kuntner 2024).

Morphological examination

Spiders were collected by hand both during day and night collecting sessions. Specimens were preserved in 75% EtOH for further morphological examination. Two to four legs were removed from the specimens and preserved in 96% EtOH for molecular studies. Specimens from La Réunion Island are deposited at the Museum of Natural History of La Réunion Island (Voucher code: MHNRé). Specimens from Madagascar are deposited at the National Institute of Biology (NIB), Ljubljana, Slovenia (Voucher code: KPARA; non-type specimens) and the National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (voucher code: USNMENT; paratype specimens). Collecting localities were pinpointed on maps using QGIS ver. 3.22.10 (QGIS.org 2023).

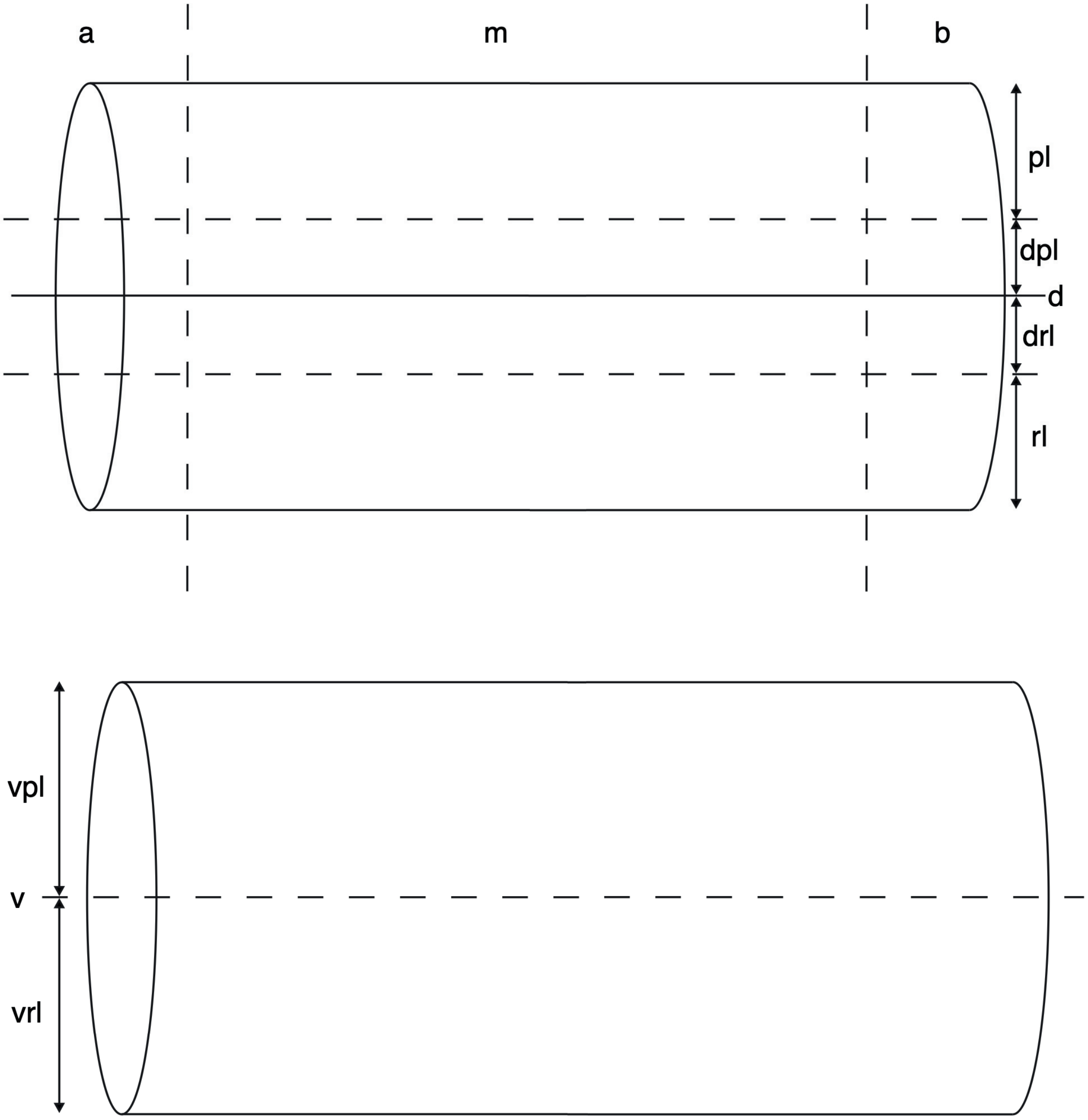

Fig. 1. General diagram showing the definition and abbreviations of the areas where the spines are located on each segment of the left legs in dorsal view (above) and ventral view (below). Abbreviations: d = dorsal; drl = dorso retrolateral; dpl = dorso prolateral; pl = prolateral; rl = retrolateral; v = ventral; vpl = ventro prolateral; vrl = ventro retrolateral; a = apical; m = median; b = basal.

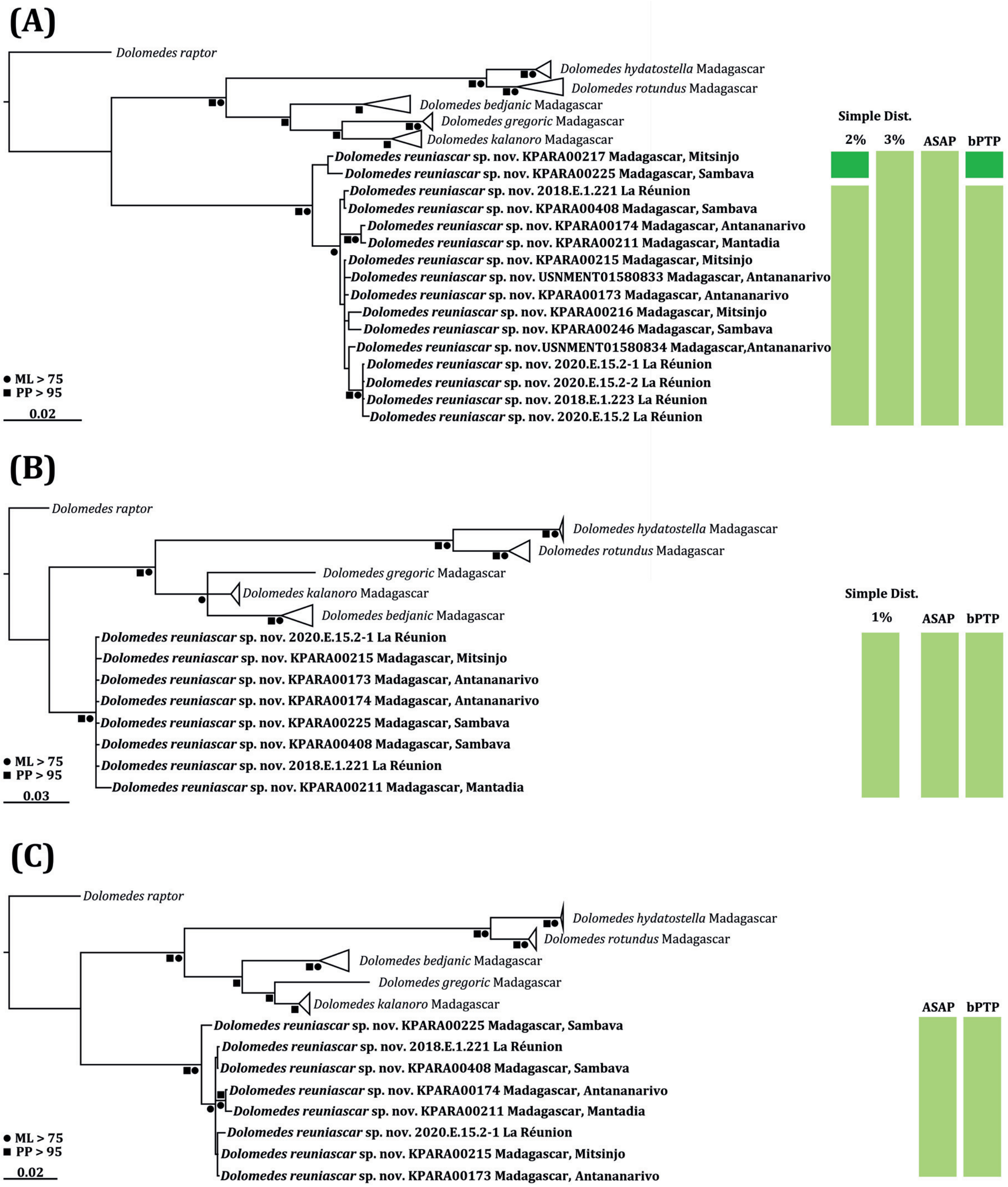

Fig. 2. Genetic analyses of *Dolomedes reuniascar* sp. nov. **A**. based on COI sequences (1192 bp). **B**. Based on 28S sequences (790bp). **C**. Based on COI+28S sequences (1982bp). Well supported nodes marked with black circles (ML > 75%) and squares (PP > 95%). Genetic distances among terminals and different operational taxonomic units suggested by species delimitations are marked in different green color codes. Abbreviations: ASAP=Assemble Species by Automatic Partitioning; bPTP = Bayesian Poisson tree processes; COI = mitochondrial cytochrome c oxidase I gene; ML = maximum likelihood; PP = posterior probability of Bayesian inference analysis.

Photographs were acquired using a Nikon AZ100 microscope with a Nikon DS-Ri2 (16 megapixels) camera, a Leica M205C stereo microscope piloted with the Leica Application Suite X (LAS X), and a Keyence digital microscope VHX7000. Most of the images and additional photographs of specimens from La Réunion were uploaded to the website "À la découverte des araignées de La Réunion" (https://araignéesréunion.com).

All measurements are in millimeters (mm). Female genitalia were dissected and cleaned in 5.2% sodium hypochlorite (NaClO) or potassium hydroxide (KOH) solution for further examination. Male left palps were detached for study, and right palps were also expanded by repeatedly soaking in distilled water and then KOH solution for further examination.

A complete description of the spination patterns of the left legs is given, along with a schematic diagram of the spine positions. We illustrated the spine positions and their numbers on each leg segment in prolateral, dorsal, retrolateral or ventral views (Fig. 1). The given illustration is inspired from those used in Bosselaers (2010). The spines of each leg segment were described from the base to the tip and from the dorsum to the venter. For instance, "Femur I = dm 1-1 da 1 pl 1-1-1-1-1", indicated that the femur I was provided medially with a row of two median dorsal spines, apically one dorsal spine and a row of four prolateral spines.

Abbreviations used in the text

Morphology

Legs:
Fe = femur
Mt = metatarsus
Pa = patella
Ta = tarsus
Ti = tibia

Eyes:
ALE = anterior lateral eye
AME = anterior median eye
PLE = posterior lateral eye
PME = posterior median eye

Female genitalia:
AB = accessory bulb
BS = base of spematheca
CD = copulatory duct
CO = copulatory opening
EF = epigynal fold
FD = fertilization duct
MF = median field
LL = lateral lobe

Male palp:
BAC = basal apophysis of cymbium
C = conductor
Cy = cymbium
DTP = distal tegular projection
E = embolus

EH = embolus hook
Fu = fulcrum
LA = lateral subterminal apophysis
MA = median apophysis
RTA = retrolateral tibial apophysis
Sa = saddle
ST = subtegulum
Te = tegulum
VTA = ventral tibial apophysis

Institutions

MNHN = National Museum of Natural History, Paris.
MHNRé = Museum of Natural History, La Réunion Island
NIB = National Institute of Biology

Collections

GC = collection Cazanove G.
KPARA = National institute of biology, Ljubljana, Slovenia, non-type specimens
USNMENT = United States National Museum, Entomology Collections

Molecular phylogeny and species delimitation

Genomic DNA was extracted using Qiagen DNeasy Blood & Tissue Kit or QIAamp DNA Micro Kit (Qiagen, Hilden, Germany) following the manufacturer's instructions. One mitochondrial, cytochrome c oxidase I (COI), and one nuclear, 28S rRNA (28S), gene were amplified. Reaction mixture (25 μL) for Polymerase Chain Reaction (PCR) contained 12.5 μL of EmeraldAmp MAX HS PCR Master Mix (Takara Bio Inc, USA) or AccuStart II PCR ToughMix (Quantabio, USA), 0.5 μL of each forward and reverse primer (10 pmol/μL, see Supp. file 1 for primer references), 0.5 μL of loading dye, 4.5–9.0 μL of distilled water and 2.5–7.0 μL of extracted genomic DNA. Sequence amplification protocols of COI started at around 95°C for 3 minutes followed by 35 cycles of 30 seconds of denaturation at 92–94°C, 30–50 seconds of annealing started at 46°C, +0.3°C per cycle until it reached 52°C, and 60–120 seconds of polymerizing at 68°C. Sequence amplification protocols of 28S is similar to that for COI, while the annealing temperature was set to 52°C at all cycles. PCR products were sent to Macrogen Europe B.V. (Amsterdam, Netherlands) for the purification and sequencing. Obtained sequences were edited in Geneious Pro ver. 5.6.7 and consensus sequences were extracted for each specimen and each DNA marker. As a control, consensus sequences were compared against the Identification System of BOLD (www.boldsystems.org) and the BLAST web application of GenBank (https://blast.ncbi.nlm.nih.gov/Blast.cgi; accessed Oct. 2021). All sequences were then uploaded to GenBank (see Supp. file 2).

For phylogenetic analyses, sequences were first aligned on MAFFT ver. 7 online server (Katoh *et al.* 2019) by default algorithm and concatenated on Mesquite ver. 3.61 (Maddison & Maddison 2018). Additional COI sequences from Yu & Kuntner's (2024) study of other Madagascar *Dolomedes* species were included for further analyses. Sequences of a *Dolomedes raptor* Bösenberg & Strand, 1906 from Taiwan were also included in the following phylogenetic analyses representing its clade as outgroup (Yu *et al.* 2025) to root the trees.

Species delimitation analyses were performed based on three sequence matrices, COI, 28S, and COI+28S. The matrices were first uploaded to the online server of Assemble Species by Automatic Partitioning (ASAP) (Puillandre *et al.* 2021). All three genetic distance substitutional models, Kimura 2 (Kimura 1980), JC (Jukes & Cantor 1969), and *p* distance, available on the ASAP online server were selected and tested with threshold probability (*p*-value) of splitting groups set below 0.05. The three matrices were also uploaded to CIPRES Science Gateway portal (Miller *et al.* 2010) for gene tree reconstructions using maximum likelihood (ML) and Bayesian inference (BI). ML analyses were performed using RaxML (Stamatakis 2014) with 1 000 bootstrap replicates using the program's fast bootstrap algorithm and GTRCAT substitution model. BI analyses were performed using MrBayes (Huelsenbeck & Ronquist 2001) with the substitution models, suggested by jModelTest (Posada 2008), set as GTR+G in COI and COI+28S matrices, and GTR+I in 28S matrix. BI analyses ran independently in two chains with ten million generations. Trees were sampled every 10 000 generations with a 25% burn-in of the trees. Topologies of the two analyses were then combined by SumTrees Ver. 4.0.0 (Sukumaran & Holder 2015) under DendroPy (Sukumaran & Holder 2010), with BI topologies set as the target trees due to the overall higher nodal supports. The combined trees were then imported into a Bayesian implementation of the Poisson tree analysis under maximum likelihood and Markov chain Monte Carlo (bPTP) (Zhang *et al.* 2013) for another species delimitation analysis.

Results

Morphological comparison

A total of 13 individuals (three males, four females, and six juveniles) and 509 spiderlings of an egg sac from La Réunion, as well as 11 individuals (seven males and four females) from Madagascar, are examined. All mature specimens share highly similar morphology in their coloration and genitalia structures and can be tentatively classified as a group different from all other known *Dolomedes* species (see Taxonomy). They are named as species group "*reuniascar*". However, we detect certain degrees of differences in the commonly used diagnostic characteristics, especially in the male retrolateral tibial apophysis (RTA). Male specimens from different localities present different numbers and sizes of the teeth of the dorsal RTA branch (see Variation).

Genetic analyses

Amplifications resulted in 16 COI sequences of 1192 bp (11 from Madagascar and five from La Réunion) and eight 28S sequences of 790 bp (six from Madagascar and two from La Réunion) of the "*reuniascar*" specimens, as well as 16 28S sequences of 790 bp from six other Madagascar *Dolomedes* species. All three gene trees (COI, 28S, COI+28S) recover similar topologies (Fig. 2). Representatives of the "*reuniascar*" group do not nest within any of the other five Madagascar *Dolomedes* species. Both ML and BI analyses recover the specimens of the "*reuniascar*" group from Madagascar and La Réunion as a clade with strong statistical support (Fig. 2). No distinct population structure is detected within the "*reuniascar*" group with most of their genetic distances below 2% (Supplementary file 3).

Most species delimitation analyses, including ASAP using different genetic substitution models, agree that representatives of the "*reuniascar*" group from Madagascar and La Réunion are conspecific (Fig. 2). On the COI gene tree, the topology-based bPTP suggests two individuals from Parc Mitsinjo and Sambava (Madagascar) as separate species (Fig. 2A). However, since only one analysis out of six suggests the presence of two operational taxonomic units and considering the similarity in genitalia structures, these two individuals are regarded as conspecific with the other specimens. Therefore, based on the above phylogenetic analyses, we consider all specimens of the "*reuniascar*" group to belong to a new species, which we describe here as *Dolomedes reuniascar* sp. nov.

Taxonomy

Class Arachnida Cuvier, 1812
Order Araneae Clerck, 1757
Family Dolomedidae Simon, 1876

Genus ***Dolomedes*** Latreille, 1804

Cispiolus Roewer, 1955; synonymized by Blandin, 1979.
Teippus Chamberlin, 1924; synonymized by Carico, 1973, after Gertsch, 1934.

Type species

Dolomedes fimbriatus (Clerck, 1757).

Dolomedes reuniascar sp. nov.

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Figs 3–14

Diagnosis

Dolomedes reuniascar sp. nov. can be distinguished from all the other known *Dolomedes* species, including those from Madagascar, by the combination of the following characters: I) the deep V-shaped epigynal folds (Figs 3D, 4A, 5C–D, 6); II) the S-shaped copulatory duct + base of spermatheca in the dorsal view (Fig. 4B); III) the crown-shaped RTA with two large ventral teeth and 5–8 smaller dorsal teeth (Figs 3E, 4C–D, see also variation Fig. 11) and; IV) the sharp medial embolic hook (Fig. 4E).

Etymology

The specific epithet '*reuniascar*' is a noun in apposition. It refers to the current known distribution of the species: La Réunion Island and Madagascar.

Type material

Holotype

FRANCE – **La Réunion** • ♀; Saint Paul, National Natural Reserve of Étang de Saint Paul, coco alley; 20°59′24″ S, 55°17′53.159″ E; 9 m a.s.l.; 20 Feb. 2018; Cazanove G. leg.; wet meadow; MHNRé, MHNRé - 2018.E.1.226.

Paratypes (6 specimens)

FRANCE – **La Réunion** • 1 ♂; same collection data as for holotype; MHNRé, MHNRé - 2018.E.1.225 • 1 ♀; Saint Paul, National Natural Reserve of Etang de Saint Paul, edge of the Tour des Roches, at the level of the Vierge du Champ-court; 21°0′1.44″ S, 55°18′4.679″ E; 10 m a.s.l.; 10 Oct. 2018; Amouret N. leg.; with egg sac emergence; MHNRé, MHNRé - 2018.E.1.223 • 1 ♂; Salazie, Mare à poule d'eau; 21°3′4.32″ S, 55°31′31.8″ E; 688 m a.s.l.; 18 Sep. 2020; Baglan A. leg.; MHNRé, MHNRé - 2020.E.15.1 • 1 ♀; Etang-Salé les Bains, wet zone; 21°17′8.16″ S, 55°23′22.56″ E; 7 m a.s.l.; s. d.; Derepas B. leg. (RE406); MHNRé, MHNRé - 2024.E.4.1 • 1 ♂; Bras Panon, Parc des berges de la Rivière du Mât; 20°58′46.2″ S, 55°38′20.759″ E; 126 m a.s.l.; 23 Jan. 2021; Dietrich M. leg.; wet zone; collected as subadult and become adult 31 Jan. 2021 after breeding (RE410); MHNRé, MHNRé - 2024.E.4.2.

MADAGASCAR – **Antananarivo Province** • 1 ♂; Parc de Tsarasaotra, Antananarivo; 18°52′0.84″ S, 47°31′4.08″ E; 1248 m a.s.l.; 3 Apr. 2022; Kuang-Ping Yu leg.; shallow marsh; USNMENT, USNMENT01580833 • 1 ♀; same data as for preceding; with egg sac; USNMENT, USNMENT01580834.

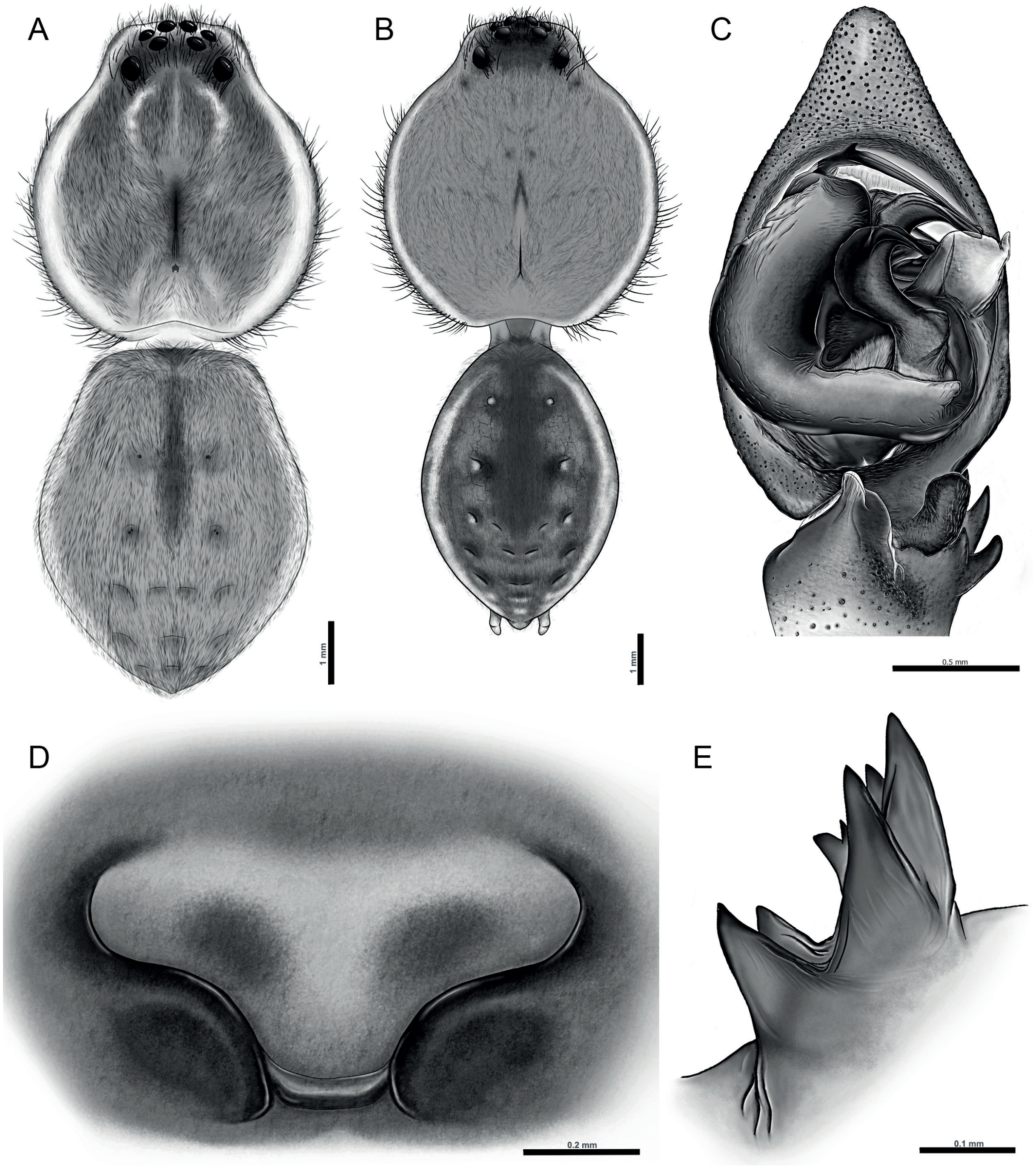

Fig. 3. General morphology of the *Dolomedes reuniascar* species group, showing the morphological feature of the group. **A**. Habitus of a female (paratype, MHNRé - 2024.E.4.1) from La Réunion, dorsal view. **B**. Habitus of a male (paratype, MHNRé - 2024.E.4.2) from La Réunion, dorsal view. **C**. Left palp of a male (paratype, USNMENT01580833) from Madagascar, ventral view. **D**. Epigyne of a female (paratype, MHNRé - 2024.E.4.1) from La Réunion, ventral view. **E**. Retrolateral tibial apophysis of a male (KPARA_00246) from Madagascar, retrolateral view. Scale bars: A–B = 1 mm; C = 0.5 mm; D = 0.2 mm; E = 0.1 mm.

Other material examined (525 specimens)

FRANCE – **La Réunion** • 1 ♀; Saint Paul, National Natural Reserve of Etang de Saint Paul; 22 Feb. 2018; unidentified Reserve agent leg.; MHNRé, MHNRé - 2018.E.1.221 • 1 juvenile; Saint Paul, Ravine Divon; 21°0′39.6″ S, 55°17′11.759″ E; 23 m a.s.l.; 24 Apr. 2009; Cazanove G. leg.; on sight; GC 268 (collection Cazanove G.) • 2 juveniles; Salazie, Mare à poule d'eau; 21°3′4.32″ S, 55°31′31.8″ E; 688 m a.s.l.; 18 Sep. 2020; Baglan A. leg.; MHNRé, MHNRé - 2020.E.15.2 • 1 juvenile; Salazie, Mare à poule d'eau; 2 Nov. 2022; 21°3′4.32″ S, 55°31′31.8″ E; 688 m a.s.l.; Cazanove G. leg.; beating, *Pistia stratiotes*; MHNRé, MHNRé - 2022.E.14.14 • 1 juvenile; same data as for preceding; MHNRé, MHNRé

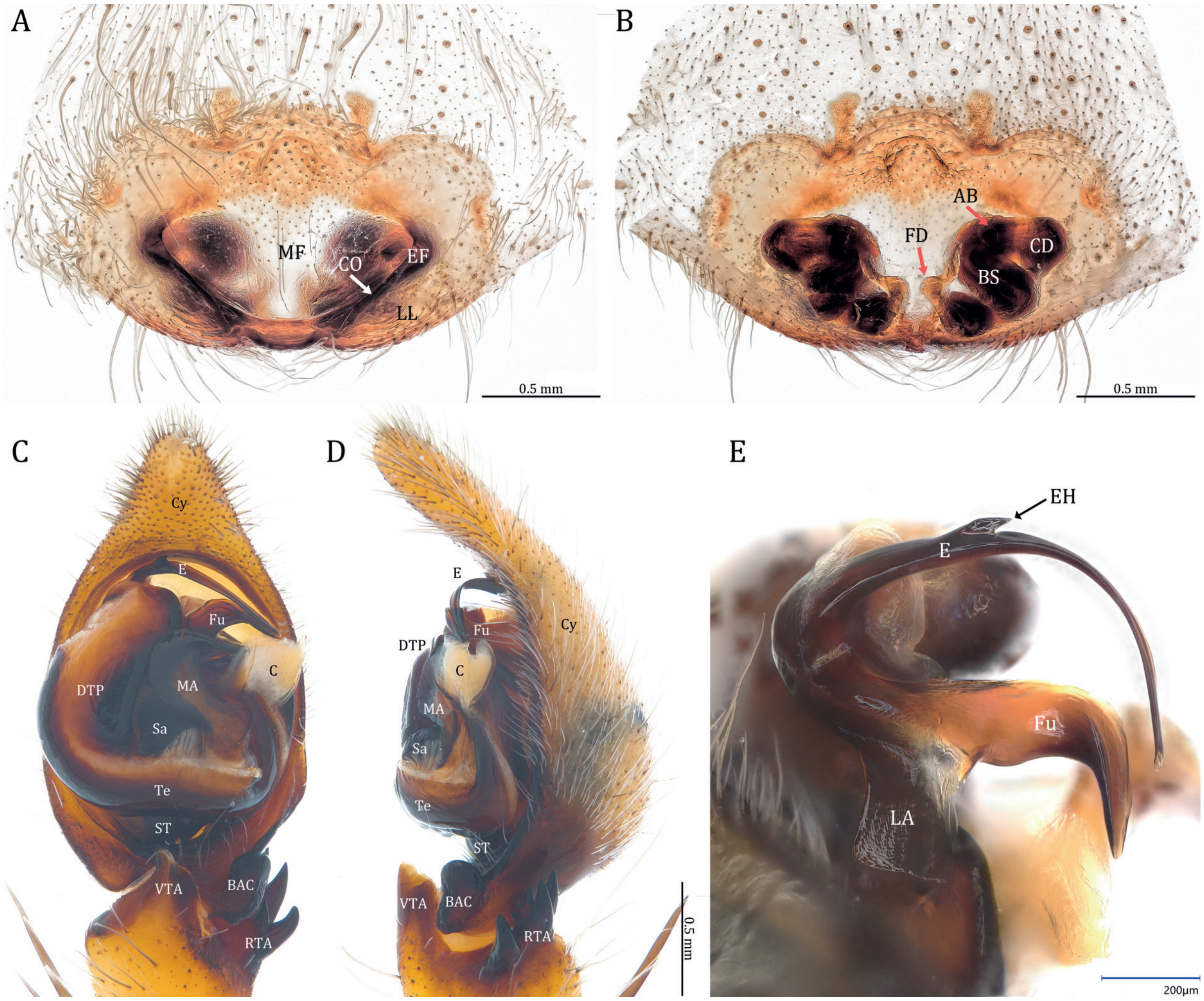

Fig. 4. Details of genitalia of *Dolomedes reuniascar* sp. nov. **A–B**. Female epigyne (paratype USNMENT01580834), ventral and dorsal views. **C–D**. Male left palp (paratype USNMENT01580833), ventral and retrolateral views. **E**. Distal sclerotized tube of apical division (DST) of the right male palp, retrrolateral view (paratype USNMENT01580833). Abbreviations: AB = accessory bulb; BAC = basal apophysis of the cymbium; BS = base of spermatheca; C = conductor; CD = copulatory duct; CO = copulatory opening; Cy = cymbium; DTP = distal tegular projection; E = embolus; EF = epigynal fold; EH = embolus hook; FD = fertilization duct; Fu = fulcrum; MA = median apophysis; MF = median field; LA = lateral subterminal apophysis; LL = lateral lobe; RTA = retrolateral tibial apophysis;. Sa = saddle; ST = subtegulum; Te = tegulum; VTA = ventral tibial apophysis. Scale bars: A–B = 1 mm; C–D = 0.5 mm; E = 0.2 mm.

- 2022.E.14.23 • 509 juveniles; Saint Paul, National Natural Reserve of Etang de Saint Paul, coco alley; 20 Feb. 2018; 20°59′24″ S, 55°17′53.159″ E; 9 m a.s.l.; Cazanove G. leg.; wet grassland; from egg sac emergence; MHNRé, MHNRé - 2018.E.1.222 • 1 juvenile; Saint Marie; 29 Nov. 1950; Hamon J. leg.; 11596 KG, collection Ledoux J-Cl., MNHN.

MADAGASCAR – **Antananarivo Province** • 1 ♀; Parc de Tsarasaotra, Antananarivo; 18°52′0.84″ S, 47°31′4.08″ E; 1248 m a.s.l.; 3 Apr. 2022; Kuang-Ping Yu leg.; shallow marsh; NIB - KPARA00173 • 1 ♂; same data as for preceding; NIB - KPARA00174 – **Toamasina Province** • 1 ♀; Parc national d'Andasibe-Mantadia; 18°51′9.36″ S, 48°25′37.919″ E, 949 m a.s.l.; 06 Apr. 2022; Kuang-Ping Yu leg.; Ponds before Chute Sacree Trail; NIB - KPARA00211 • 3 ♂; Parc Mitsinjo, Orchid Lake; 18°55′58.08″ S, 48°24′48.96″ E; 935 m a.s.l.; 07 Apr. 2022; Kuang-Ping Yu leg.; NIB - KPARA00215–00217 – Antsiranana Province • 2 ♂; Sambava; 14°22′24.96″ S, 50°10′23.159″ E; 13 m a.s.l.; 23 Mar. 2022; Kuang-Ping Yu leg.; Swamp 11.5 km SE of Sambava; collected as subadults; NIB - KPARA00225 & NIB - KPARA00246 • 1 ♀: same data as for preceding; collected as juvenile; NIB - KPARA00408.

Records based on photographs and observations

We compiled some other observations of *Dolomedes reuniascar* sp. nov. on La Réunion island (see Appendix 1).

Description

Female (Holotype MHNRé - 2018.E.1.226)
Total length: 13.2.

Color. Carapace greenish yellow, with white margins and two pale yellow arc-shaped markings behind ALEs; eye region dark; clypeus white; chelicerae greenish yellow with dark reddish fangs; labium and endites yellowish beige; palp greenish brown; sternum pale yellow; legs: coxa and trochanter yellow; femur yellow with lateral side slightly greenish, patella greenish with reddish tip, tibia, metatarsus and tarsus light brown; abdomen darker than the cephalothorax, with white spots in one median and two sublateral rows extending to the posterior end, near spinnerets; ventral abdomen clear, pale yellow; lateral sides of abdomen with white band extend from lateral white margin of cephalothorax; spinnerets greenish.

Carapace (Figs 3A, 5A). 6.8 length; 6.1 width; 2.2 height. Pear-shaped, with concave posterior margin; eye region with long bristles originating behind and overhanging the posterior lateral eyes. Fovea longitudinal, slit-like, strongly marked.

Eyes. Two rows, each with four homogeneous-sized eyes. Anterior row slightly procurved while posterior row strongly recurved.

Eyes measurements. ALE 0.18; AME 0.23; PLE 0.43; PME 0.4; ALE-AME 0.075; AME-AME 0.28; PME-PME 0.33; PME-PLE: 0.43; Clypeus 0.7 high.

Sternum (Fig. 5B). 2.5 long and 2.8 wide. Wider than long, with sinuous lateral margins pointing between coxae, anterior margin with two shallow concavities, with long, evenly dispersed setae.

Chelicerae. Robust, with four retromarginal teeth and two to three promarginal teeth; central promarginal tooth is the largest.

Abdomen (Figs 3A, 5A–B, paratype). Greenish, dorsolaterally with two main, slightly curved rows of 5 to 6 white spots ringed with black, posterior half medially with few other spots: most anterior pairs arranged transversal and posterior pairs arranged longitudinal.

Table 1. Measurements of each segment of the left leg, female holotype MHNRé - 2018.E.1.226.

	Fe	**Pa**	**Ti**	**Mt**	**Ta**	**Total**
I	6.6	2.9	5.9	4.2	2.2	21.8
II	5.7	3.2	6.2	3.7	2.1	20.9
III	5.8	2.3	5.6	4.6	2.4	20.7
IV	7.7	3.1	6.8	6.3	3.4	27.3

Genitalia (Figs 3D, 5C–E, paratype; 6). Epigyne with large median field (MF) forming shallow atrium, with widely opened V-shaped posterior margin that forms strongly sclerotized epigynal folds (EF); with fully separated lateral lobes (LL) blunt, converging posteriorly; copulatory openings (CO) minute, located along epigynal folds (EF). Vulva symmetrical, each with semicircular copulatory duct (CD) originating posteriorly and extend anteriorly to indistinct spermathecal base; accessory bulb (AB) small, dorsally pointed; base of spermatheca (BS) well developed, arranged in 'S' shape; fertilization duct (FD) positioned medially and bent 90° outward.

Palp. With strong spines.

Legs. With strong spines (see Fig. 7) and numerous trichobothria and bristles on tarsi, metatarsi and tibiae. Leg formula: 4123.

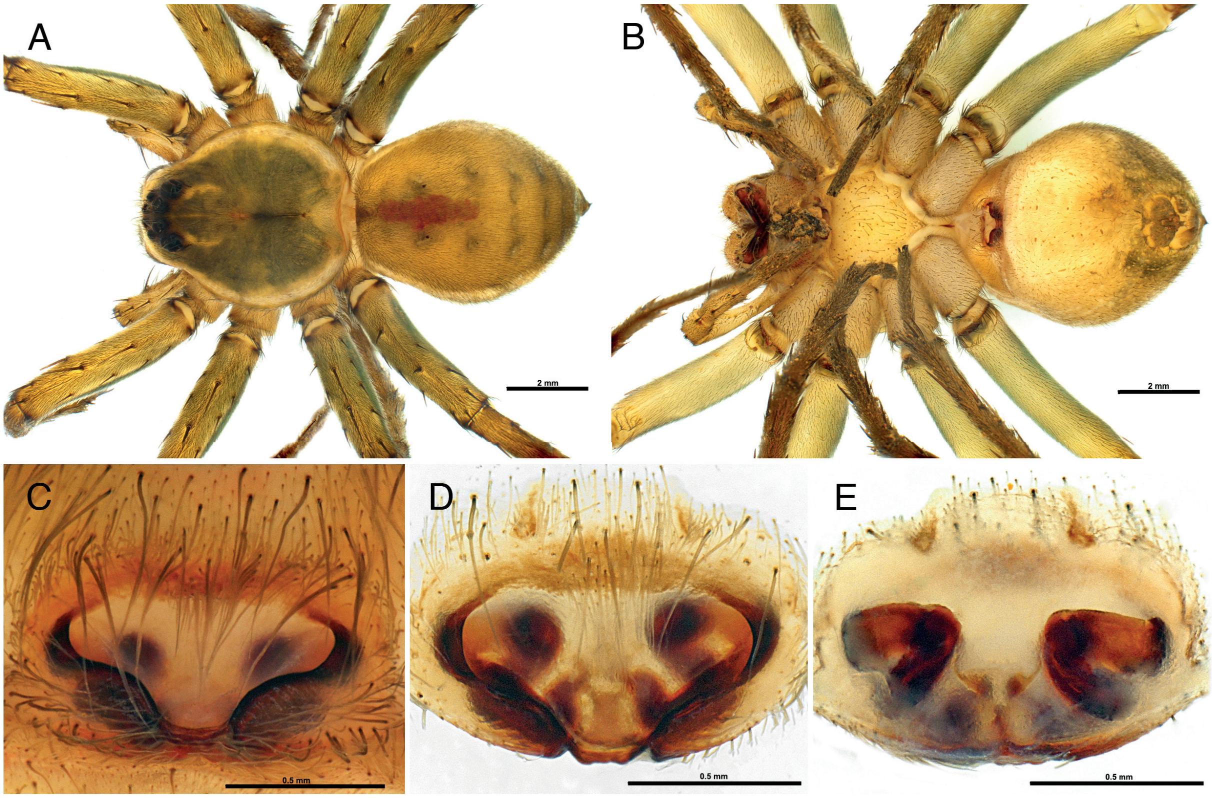

Fig. 5. Female of *Dolomedes reuniascar* sp. nov. (paratype MHNRé - 2024.E.4.1). **A**. Habitus, dorsal view. **B**. Idem, ventral view. **C**. Epigyne, ventral view. **D**. Idem, dissected. **E**. Vulva, dorsal view. Scale bars: A = 2 mm; B = 2 mm; C = 0.5 mm; D = 0.5 mm; E = 0.5 mm.

Table 2. Measurements of each segment of the left leg, male paratype MHNRé - 2018.E.1.225.

	Fe	**Pa**	**Ti**	**Mt**	**Ta**	**Total**
I	6.3	2.5	5.7.	5.5	3.3	23.3
II	5.4	2.4	5.9	4.8	3.2	31.7
III	5.3	1.7	4.7	4.2	2.3	18.2
IV	6.3	2.2	6.3	5.9	3.2	23.9

Leg measurements: see Table 1.

Leg spination formula:

Femur I = dm 1-1 da 1 pl 1-1-1 rl 1-1-1-1-1; patella I = rlm 1 plm 1 da 1; tibia I = db 1 dm 1 pl 1-1 rl 1-1; vpl 1-1-1-1 vrl 1-1-1-1; metatarsus I = dpla 1 drla 1 pl 1-1-1 rl 1-1-1 vpl 1-1 vrl 1-1 va 1; tarsus I = 0.

Femur II = dm 1-1 da 1 pl 1-1-1-1-1 rl 1-1-1-1-1; patella II = rlm 1 plm 1 da 1; tibia II = db 1 dm 1 pl 1-1 rl 1-1 vpl 1-1-1-1 vrl 1-1-1-1; metatarsus II = dpla 1 drla 1 pl 1-1-1 rl 1-1-1 vpl 1-1 vrl 1-1 va 1; tarsus II = 0.

Femur III = dm 1-1 da 1 pl 1-1-1-1-1 rl 1-1-1-1-1; patella III = rlm 1 plm 1 da 1; tibia III = db 1 dm 1 rl 1-1 pl 1-1 vrl 1-1-1 vpl 1-1-1; metatarsus III = dpla 1 drla 1 pl 1-1-1 rl 1-1-1 vpl 1-1 vrl 1-1 va 1; tarsus III = 0.

Femur IV = dm 1-1 da 1 pl 1-1-1-1-1 rl 1-1; patella IV = rlm 1 plm 1 da 1; tibia IV = db 1 dm 1 rl 1-1 pl 1-1 vrl 1-1-1 vpl 1-1-1; metatarsus IV = dpla 1 drla 1 pl 1-1-1 rl 1-1-1 vpl 1-1 vrl 1-1-1 va 1; tarsus IV = 0.

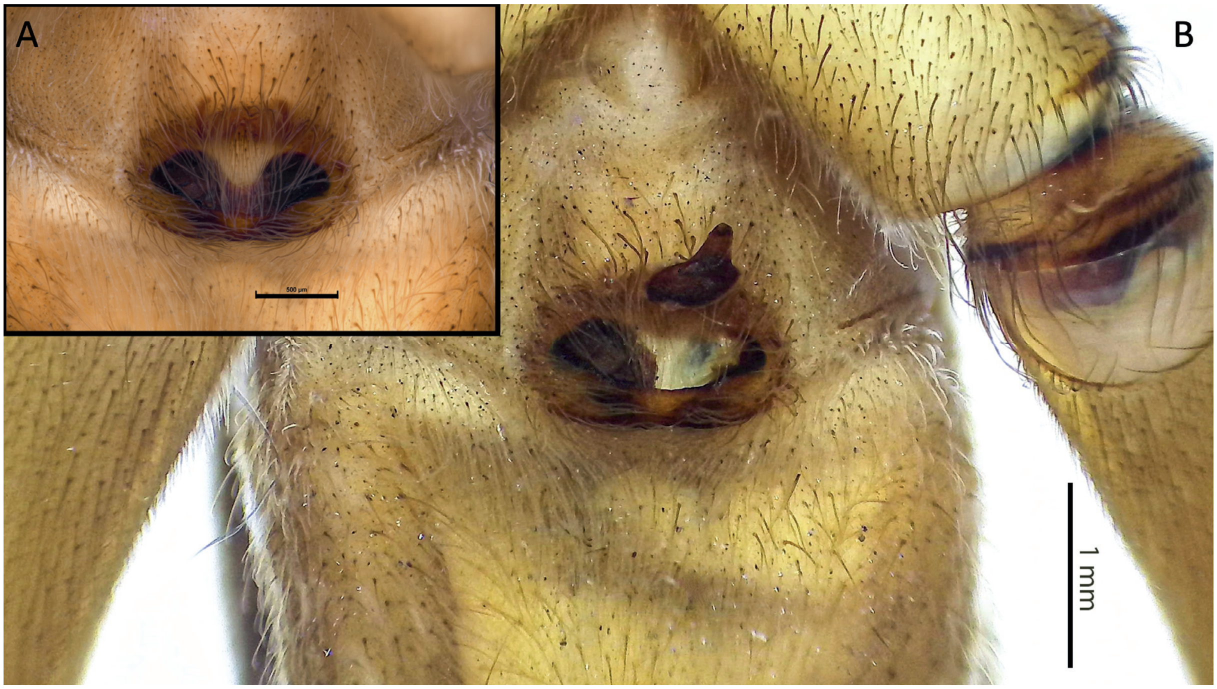

Fig. 6. *Dolomedes reuniascar* sp. nov. from La Réunion Island (holotype MHNRé - 2018.E.1.226), epigynal plug. **A**. Epigyne with plugs. **B**. Idem, with the left plug removed. Scale bars: A = 0.5 mm; B = 1 mm.

Table 3. Phenology of *Dolomedes reuniascar* sp. nov. derived from the examined material. Records exclusive to Madagascar are in italics while those exclusive to La Réunion are underlined, data from both islands are both italicized and underlined. Abbreviations and symbols: AD = adult; Juv = juvenile; ? = unknown.

Month	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**	**Jul.**	**Aug.**	**Sep.**	**Oct.**	**Nov.**	**Dec.**
State	Juv	AD	*AD*	*AD*	Juv	Juv	Juv	?	AD	AD	Juv	Juv
		Juv	*Juv*	*Juv*					Juv			

Spine position and their number are illustrated in Fig. 7.

Claws. Superior tarsal claw teeth numbers: 6–7 (I), 7–8 (II), 7–8 (III), 8–9 (IV); inferior tarsal claw without tooth.

Male (paratype MHNRé - 2018.E.1.225 and MHNRé - 2024.E.4.2)
As in female except as noted. Total length: 9.

Carapace (Figs 3B, 8A). 4.5 length, 4.3 width, 1.7 height.

Eyes measurements. ALE 0.13; AME 0.15; PLE 0.3; PME 0.28; ALE-AME 0.13; AME-AME 0.1; PME-PME 0.18; PME-PLE: 0.28; Clypeus 0.48 high.

Sternum (Fig. 8B). 1.7 long and 2.2 wide.

Chelicerae (Fig. 8C). Robust, with four retromarginal teeth and two to three promarginal teeth; central promarginal tooth the largest.

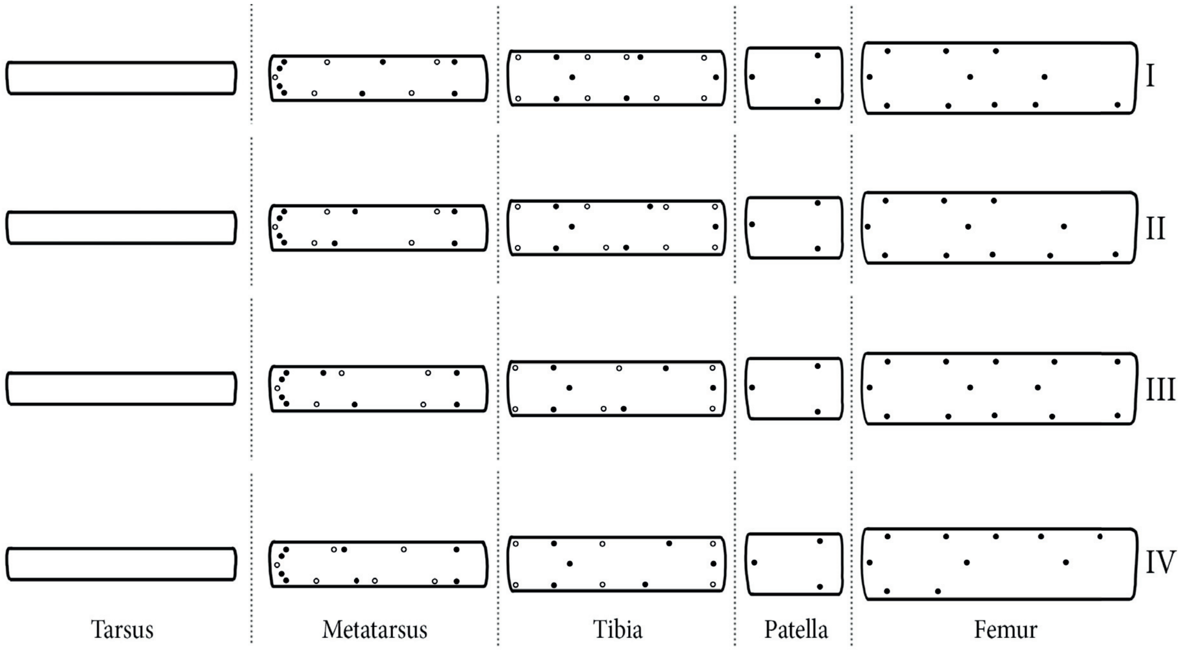

Fig. 7. Relative position of leg spines in *Dolomedes reuniascar* sp. nov., female holotype MHNRé - 2018.E.1.226. Left legs. Legend: spine in dorsal view (●); spine in ventral view (o).

Genitalia (Figs 3E (KPARA_00246), 9, see also variation Fig. 11). Palp tibia provided with prominent VTA and RTA with two large ventral teeth and 6 smaller dorsal teeth. Cymbium (Cy) with stout, roughly oval-shaped basal apophysis (BAC). Sub tegulum (ST) semicircular, sitting at base of tegulum. Tegulum (Te) stout and transverse, provided with thick and curved distal tegular projection (DTP) forming 'U' shaped tegular ring together with membranous conductor (C); sclerotized round-shaped structure (Sa) sitting in lower center tegular ring with sickle-shaped median apophysis (MA) positioned retrolaterally. Embolus (E) long, tapered, originating anteriorly and directed retrolaterally, in middle with small hook-shaped extension (EH) pointing anteriorly. Embolus emerging anteriorly from distal sclerotized tube of apical division together with rectangular lateral subterminal apophysis (LA) and sharply hooked fulcrum (Fu).

Leg measurements: see Table 2.

Leg spination formula:

Femur I = dm 1-1 da 1 pl 1-1-1-1-1 rl 1-1-1-1-1; patella I = rlm 1 plm 1 da 1; tibia I = db 1 dm 1 pl 1-1 rl 1-1 vpl 1-1-1-1 vrl 1-1-1-1; metatarsus I = dpla 1 drla 1 pl 1-1-1 rl 1-1-1 vpl 1-1 vrl 1-1 va 1; tarsus I = 0.

Femur II = dm 1-1 da 1 pl 1-1-1-1-1 rl 1-1-1-1-1; patella II = rlm 1 plm 1 da 1; tibia II = db 1 dm 1 pl 1-1 rl 1-1 vpl 1-1-1-1 vrl 1-1-1-1;; metatarsus II = dpla 1 drla 1 pl 1-1-1 rl 1-1-1 vpl 1-1 vrl 1-1 va 1; tarsus II = 0.

Femur III = dm 1-1 da 1 pl 1-1-1-1-1 rl 1-1-1-1-1; patella III = rlm 1 plm 1 da 1; tibia III = db 1 dm 1 rl 1-1 pl 1-1 vrl 1-1-1 vpl 1-1-1; metatarsus III = dpla 1 drla 1 pl 1-1-1 rl 1-1-1 vpl 1-1 vrl 1-1 va 1; tarsus III = 0.

Femur IV = dm 1-1 da 1 pl 1-1-1-1-1 rl 1-1-1; patella IV = rlm 1 plm 1 da 1; tibia IV = db 1 dm 1 rl 1-1 pl 1-1 vpl 1-1-1 vrl 1-1-1; metatarsus IV = dpla 1 drla 1 pl 1-1-1 rl 1-1-1 vpl 1-1 vrl 1-1-1 va 1; tarsus IV = 0.

Spine position and their number are illustrated in Fig. 10.

Variation

Variability in spination in *Dolomedes reuniascar* sp. nov. has not been studied extensively in this paper. Therefore, the leg spination diagram (Figs 7, 10) does not take into account possible intra- and inter-individual variability. A few additional observations were made:

The female paratype MHNRé - 2018.E.1.223 presents a shorter and thicker right leg IV (probable autotomy) with a tibia of the following formula: tibia IV = db 1 dm 1 rl 1-1 pl 1-1 vpl 1-1-1-1-1-1 vrl 1-1-1-1.

The female specimen MHNRé – 2018.E.1.221 has a left femur I with following formula: dm 1-1 da 1 pl 1-1-1-1-1 rl 1-1-1-1-1 whereas its right femur I has : dm 1-1 da 1 pl 1-1-1-1 rl 1-1-1-1-1-1.

The male paratype MHNRé - 2018.E.1.225 presents for it left femur III: dm 1-1 da 1 pl 1-1-1-1 rl 1-1-1-1-1; whereas its right femur III is: dm 1-1 da 1 pl 1-1-1-1-1-1 rl 1-1-1-1-1-1-1.

Variability in cheliceral teeth: *Dolomedes reuniascar* sp. nov. may exhibit a bifid central tooth on the promargin, giving the impression of having four teeth. This feature is observed on the left chelicerae of male specimen MHNRé - 2024.E.4.2. Additionally, the female specimen MHNRé - 2018.E.1.221 was found to present five retromarginal teeth of the chelicerae.

Variability in color: living individuals of *Dolomedes reuniascar* sp. nov. typically exhibit a greenish livery (see Appendix 1a–e). However, this can vary among individuals, ranging from greenish–yellow

(Appendix 1f) to shades of orange and brown (Appendix 1g, i–k, m–o), and even including darker variations (Appendix 1h, l, p).

Variability in the male palp: specimens from La Réunion Island and Madagascar exhibit differences in the RTA, with the number of teeth on the dorsal RTA branch ranging from five to eight in varied sizes (Fig. 11). The left palp of the individual KPARA00173 from Madagascar lacks an EH. The function of this unique structure remains unknown.

Distribution

Northern and eastern Madagascar and La Réunion Island (Fig. 12).

Remarks: Although La Réunion Island and Madagascar are highly isolated land masses and the individuals from both islands present morphological variations, especially in the male RTA, the species delimitation analyses suggested that the populations from both islands are conspecific. Considering that relatively high variability of the RTA has also been reported by Vink & Dupérré (2010) and Raven & Hebron (2018), the variation observed in this study can be considered intraspecific. *Dolomedes reuniascar* sp. nov. represents the first dolomedid and the first *Dolomedes* species on La Réunion Island, as well as and the sixth *Dolomedes* species on Madagascar.

Natural history

Phenology

Dolomedes reuniascar sp. nov. can be found throughout the year as juveniles with two known adult seasons. Based on the examined material and the occurrence data cited (see Material examined section), there are two known adult seasons on La Réunion Island while only one known on Madagascar. In general, the adult seasons of *D. reuniascar* sp. nov. occur in early spring and late summer to early autumn (Table 3).

Habitats

On La Réunion Island, first instar juveniles of *D. reuniascar* sp. nov. seems to prefer terrestrial habitats, where they build small webs on the underside of shrub leaves in shaded areas (Fig. 13A). They quickly hide on the reverse side of the leaf at even the slightest disturbance (G. Cazanove pers. obs.). Older juveniles instars (Fig. 13B) and adults (Fig. 13C–E) are more commonly found in slow-moving, still-water aquatic habitats with low vegetation in sunny ecosystems (G. Cazanove pers. obs.). In Madagascar, *D. reuniascar* sp. nov. prefers similar habitats: standing, well-vegetated ponds with open canopy (Fig. 13F; see also Yu & Kuntner 2024).

Feeding

Similar to other documented diets of *Dolomedes* (see Nyffeler & Pusey 2014; Baba *et al.* 2019), *D. reuniascar* sp. nov. has been observed preying on both invertebrates and vertebrates. Under natural conditions, we observed a case of *D. reuniascar* sp. nov. preying on a damselfly (*Africallagma glaucum* (Burmeister, 1839), Coenagrionidae) (Fig. 13G). In captivity, the spider has also been observed preying on the guppy *Poecilia reticulata* Peters, 1859 (Poeciliidae) (Fig. 13C).

Mating and reproduction

Although no direct observations of mating have been made in *D. reuniascar* sp. nov., the examination of female genitalia suggests that male *D. reuniascar* sp. nov. may produce copulatory plugs (Fig. 6). Such removeable structures were found in the holotype epigyne (MHNRé - 2018.E.1.226) from La Réunion but were not found in any examined specimens from Madagascar. The male plug appears to be a solidified or gelled secretion: the outer part is flat and the inner part conforms to the shape of the female epigyne's internal canal. To our knowledge, mating plugs are rare in *Dolomedes*.

Like other *Dolomedes*, *Dolomedes reuniascar* sp. nov. carries its egg sac in its chelicerae and secures it by rolling it up with its pedipalps and pressing against its sternum (G. Cazanove pers. obs.; Fig. 13H). As in other *Dolomedes*, *D. reuniascar* sp. nov. also build nursery webs on vegetation. In Madagascar, only a few nursery webs with empty egg sacs were observed in the field, anchored to the tip of the vegetation near to the adults' habitats (K.-P. Yu pers. obs.; Fig. 13I). However, it is not confirmed that these empty nursery webs belong to the species, as no spiders were found in them. On La Réunion Island, a nursery web of *D. reuniascar* sp. nov. was observed with a female adult nearby. The female was absent a few days later after the spiderling hatched (Fig. 13J–K; J.M. Tamon pers. comm.). In captivity, the female *D. reuniascar* sp. nov. places her egg sac in a corner of the terrarium within a web without any specific structure and refrained from foraging during the spiderling emergence period (G. Cazanove pers. obs.).

Early stages

Early stages of juveniles are dark green, with their cephalothorax covered with white setae forming a distinctive striped pattern. Two convergent white median lines meet at eye level (Fig. 13A; Appendix 1q). Between these, the coloration is somewhat orange. A small line of white setae above each posterior lateral eye. The abdomen is slightly lighter in color. Two white lines extend from the pedicel and diverge towards the end of the abdomen. A third median white line is also present between these two, but it does not extend to the posterior edge of the abdomen. Additionally, the sides of the abdomen are stripped with white setae.

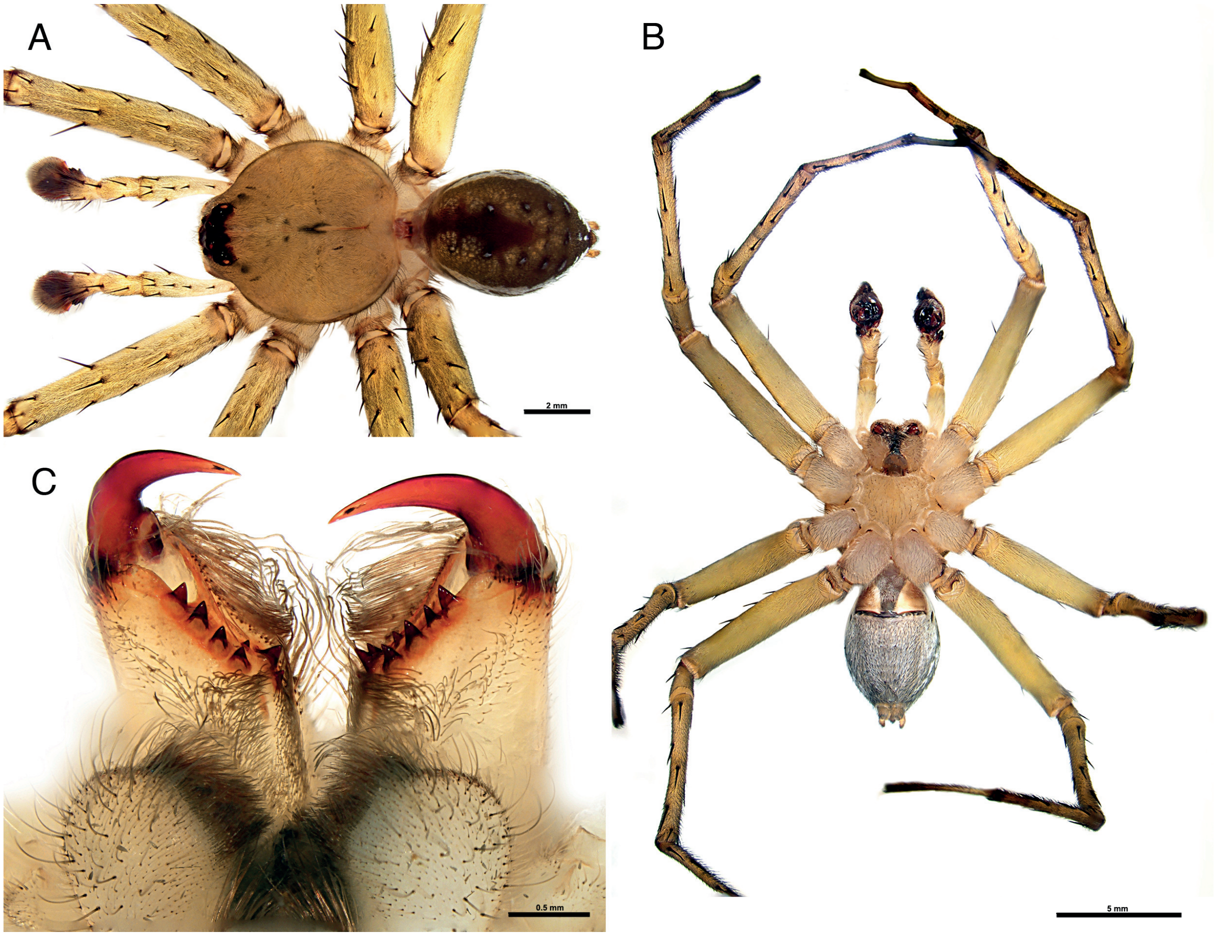

Fig. 8. Male paratype of *Dolomedes reuniascar* sp. nov. (MHNRé - 2024.E.4.2). **A**. Habitus, dorsal view. **B**. Cephalothorax, frontal view. **C**. Palp, ventral view. Scale bars: A = 2 mm; B = 5 mm; C = 0.5 mm.

Others behaviors

The nycthemeral rhythm of *Dolomedes reuniascar* sp. nov. is not well-defined. According to Raven and Hebron's (2018) review, not all *Dolomedes* species are strictly nocturnal. Our observations of *D. reuniascar* sp. nov. on La Réunion Island, where it was consistently seen during the day (Cazanove pers. obs.) contrast with reports from Madagascar, where the species appears to be both diurnal and nocturnal (Kuang-Ping Yu pers. obs.). Additionally, *D. reuniascar* sp. nov. has been observed diving underwater for several minutes when disturbed (G. Cazanove & J.M. Tamon pers.obs.). This behavior may serve as an anti-predator mechanism, though maximum duration that the spider can remain submerged remains unknown.

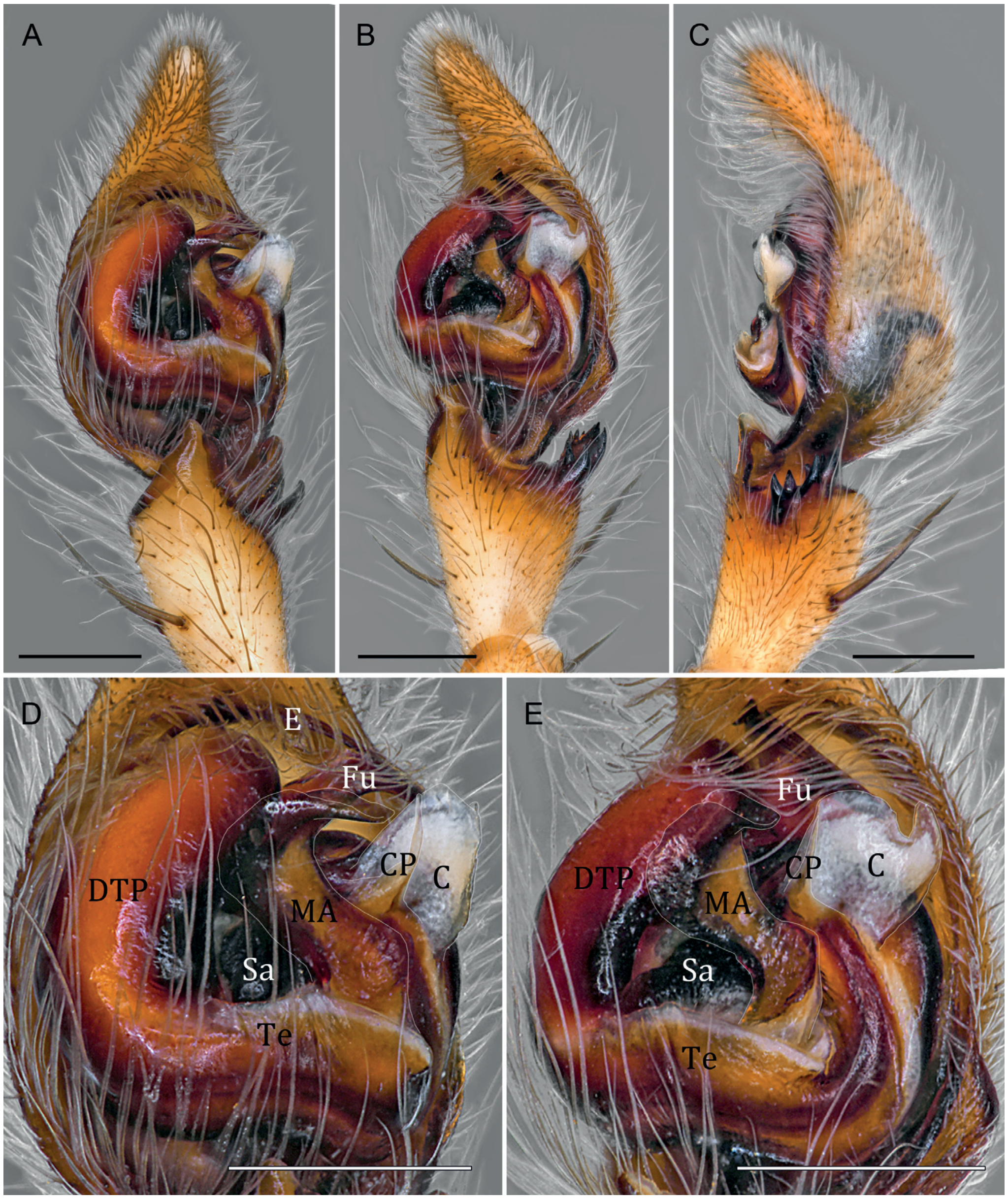

Fig. 9. Male palp of *Dolomedes reuniascar* sp. nov. (paratype MHNRé - 2028.E.1.225). **A**. Pro-ventral view. **B**. retro-ventro view. **C**. Retrolateral view. **D–E**. Bulb details, pro-ventral and retro-ventro views. Abbreviations: C = conductor; CP = additional conductor process; DTP = distal tegular projection; E = embolus; Fu = fulcrum; MA = median apophysis; Sa = saddle; Te = tegulum. Scales bars = 0.5 mm.

Discussion

Our integrative approach demonstrates how combining multiple lines of evidence can enhance the taxonomic accuracy among spider taxa with varying diagnostic characteristics. In this study, we investigated the species boundaries of a group of *Dolomedes* morphospecies from Madagascar and La Réunion. While specimens from these isolated islands exhibit similar overall morphology, they show certain differences in their genitalia structures, especially in the retrolateral tibial apophysis of the male palps. Although these morphological differences and the endemic nature of the faunas on the two islands might suggest the presence of distinct species, molecular evidence indicates that these specimens are conspecific. Consequently, these differences are interpreted as intraspecific variations.

Towards better *Dolomedes* taxonomy

Dolomedes reuniascar sp. nov. exemplifies the challenges associated with defining species boundaries within the *Dolomedes* genus. As a globally diverse genus with over a hundred species, *Dolomedes* species often share striking similarities in their genitalia morphology (Carico 1973; Zhang *et al.* 2004; Tanikawa & Miyashita 2008; Vink & Dupérré 2010; Raven & Hebron 2018; Yu & Kuntner 2024). Determining species boundaries becomes particularly challenging among closely related and widely distributed species due to the relatively high intraspecific variation. Interestingly, in these cases (e.g., *D. angustivirgatus* Kishida, 1933 vs *D. sulfureus* L. Koch, 1878, see Tanikawa & Miyashita 2008; *D. dondalei* Vink & Dupérré 2010 vs other New Zealand *Dolomedes*, see Vink & Dupérré 2010), somatic features like sizes, coloration, and appendage length appear more useful for species identification than genitalia characteristics. This trend is also observed at the genus level, such as between *Dolomedes* and *Ornodolomedes* Raven & Hebron 2018 (Raven & Hebron 2018). These examples suggest that somatic characteristics, alongside genitalia anatomy, should be given serious consideration in the taxonomy of *Dolomedes* and similar taxa with ambiguous species boundaries.

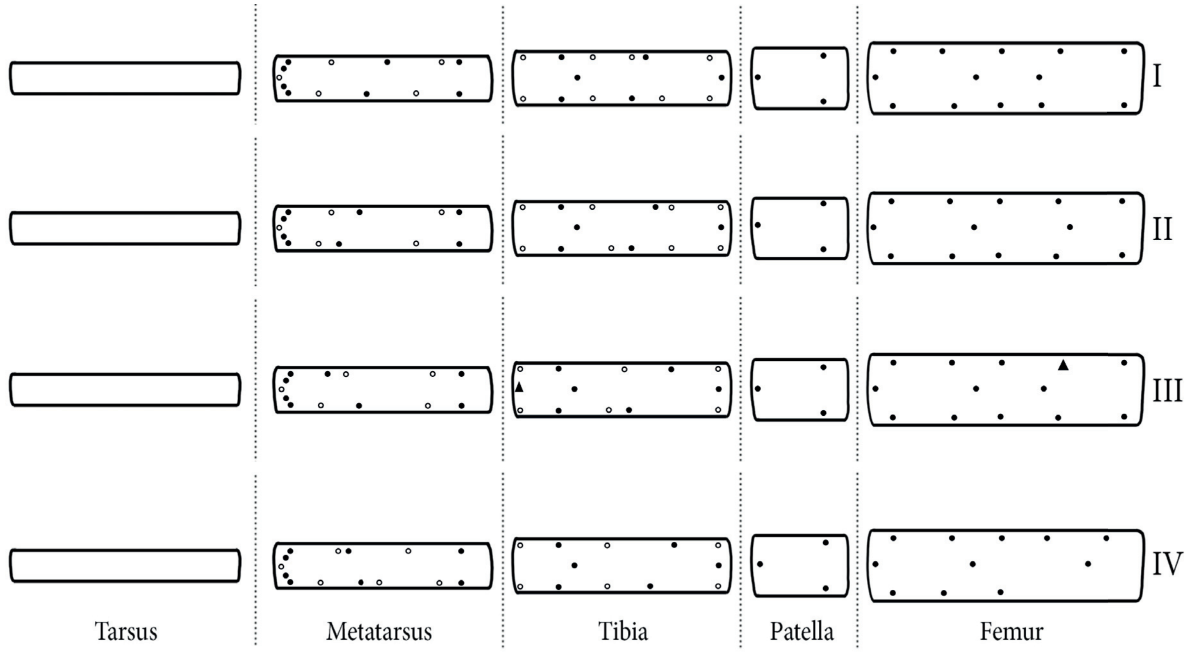

Fig. **10**. Relative position of leg spines in *Dolomedes reuniascar* sp. nov., male. Left side. Legend: spine in dorsal view (●); spine in ventral view (o); difference compared with right side (▲) (paratype MHNRé - 2020.E.15.1). Female *Dolomedes reuniascar* sp. nov. has the same spination as the male, except for femur I and femur IV.

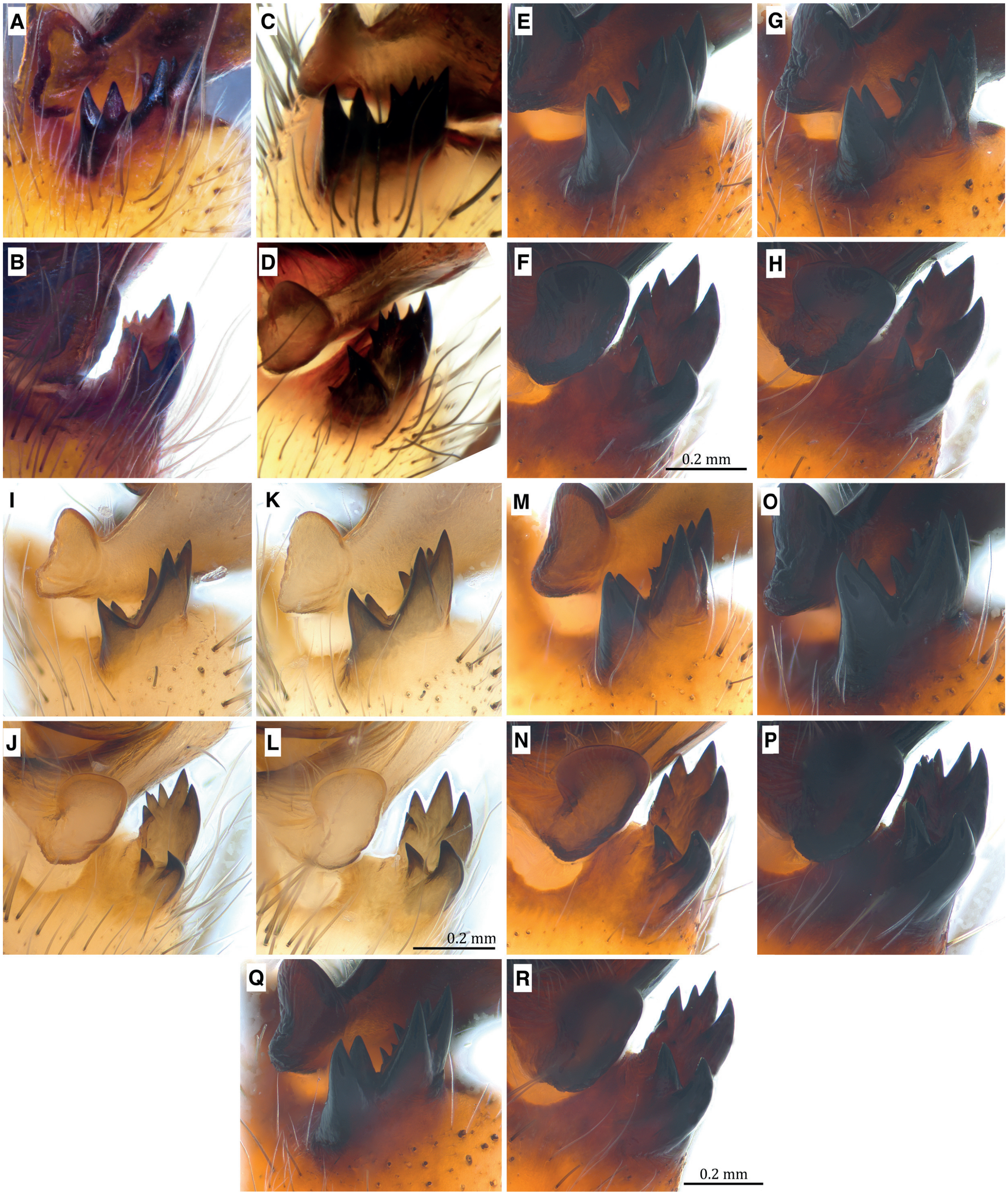

Fig. 11. Comparison of the male RTA among specimens from La Réunion (A–D) and Madagascar (E–R). **A, C, E, G, I, K, M, O, Q, R**. retrolateral view. **B, D, F, H, J, L, N, P, R**. ventral view. **A–B**. Paratype: MHNRé - 2028.E.1.225 (Réunion, National Natural Reserve of Etang de Saint Paul). **C–D**. Paratype: MHNRé - 2024.E.4.2 (Réunion, Bras Panon). **E–F**. Paratype: USNMENT01580833. **G–H**. KPARA00173 (Madagascar, Antananarivo). **I–J**. KPARA00225 (Madagascar, Sambava). **K–L**. KPARA00246 (Madagascar, Sambava). **M–N**. KPARA00215 (Madagascar, Parc Mitsinjo). **O–P**. KPARA00216 (Madagascar, Parc Mitsinjo). **Q–R**. KPARA00217 (Madagascar, Parc Mitsinjo). Scale bars = 0.2 mm.

The use of multiple genes in integrative approaches is essential for studying species groups with fairly small genetic divergences. While DNA barcodes (COI) are commonly used to test species boundaries (e.g., Tanikawa & Miyashita 2008; Yu & Kuntner 2024), relying solely on a single gene may have limitations, especially in cases where genetic distances are minimal (i.e., close or smaller than 2%), such as the introgression observed between *D. minor* L. Koch, 1876 and *D. aquaticus* Goyen, 1888 (Lattimore *et al.* 2011). To date, our understanding of species boundaries within *Dolomedes* remains incomplete. A comprehensive diagnostic survey of the genus on a global basis is needed (see Yu & Kuntner 2024). To the best of our knowledge, integrative approaches with specified species concepts (see also Bond *et al.* 2022) combining thorough morphological, molecular, or even ecological data are highly recommended for advancing *Dolomedes* taxonomy.

Biogeographic hypotheses behind *Dolomedes reuniascar* sp. nov.

The lack of genetic structure in *D. reuniascar* sp. nov. between Madagascar and La Réunion is similar to that found in Casquet's (2012) studies in the web building spider Tetragnathidae Menge, 1866. Our results may indicate that *D. reuniascar* sp. nov. may have overcome a significant geological barrier, given that Madagascar and La Réunion Island have never been connected and are separated by around 700 km of ocean (Thébaud *et al.* 2009). Unlike Tetragnathidae, which are well known for their good dispersal ability (Gillespie *et al.* 1994), freshwater organisms are generally perceived as poor dispersers due to their reliance on freshwater environments. Nevertheless, the distribution patterns of some species, including *D. reuniascar* sp. nov., challenge this perception. Hereafter we propose two potential biogeographical scenarios to explain this distribution pattern.

Although not empirically studied, *D. reuniascar* sp. nov. is likely to possess strong dispersal abilities, which may involve ballooning of the spiderlings. Ballooning, the aerial dispersal of spiderlings, is recognized as a common method for long-distance dispersal in spiders (Bell *et al.* 2005). While this

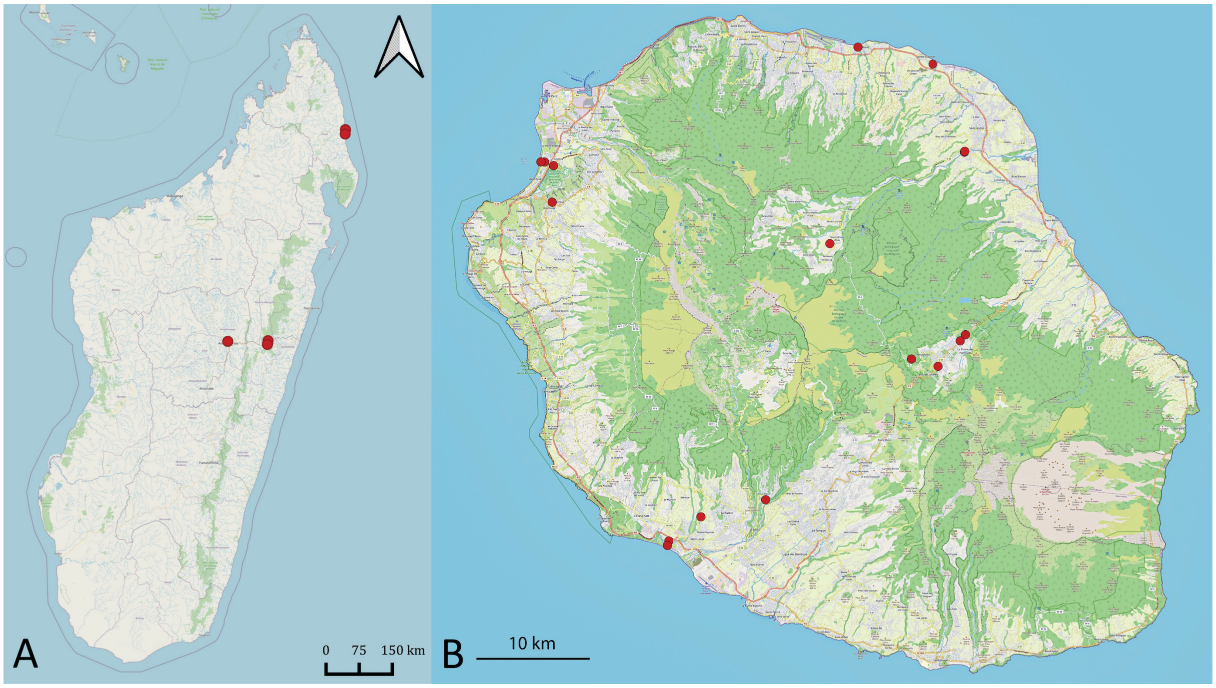

Fig. 12. Current distribution of *Dolomedes reuniascar* sp. nov. records. **A**. Madagascar. **B**. La Réunion Island. For La Réunion island, all observations were compiled, including records based on photographs (see Appendix 1).

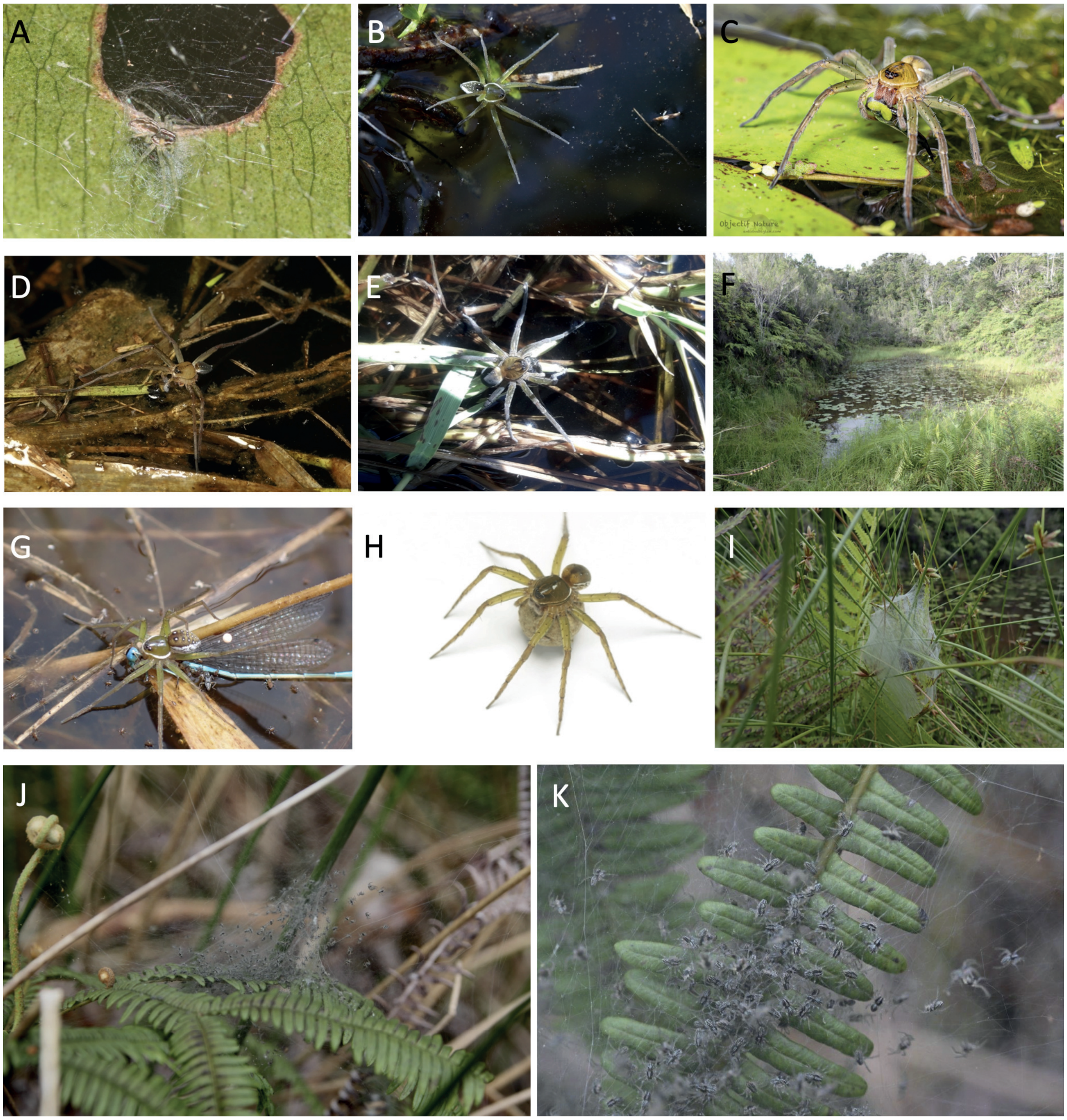

Fig. 13. Photos of natural history of *Dolomedes reuniascar* sp. nov. **A**. First instar juvenile on a small web on leaves - Allée coco; National Natural Reserve of étang de Saint Paul, La Réunion (photography by G. Cazanove). **B**. Juvenile – open pond; Sambava, Madagascar (photography by Kuang-Ping Yu). **C**. Predation of a guppy (*Poecilia reticulata*; Poeciliidae) by *Dolomedes reuniascar* sp. nov., St Denis, La Réunion (photography by A. Baglan). **D**. Adult male (KPARA00215) – open pond; Parc Mitsinjo, Madagascar (photography by Kuang-Ping Yu). **E**. Adult of *Dolomedes reuniascar* sp. nov. – wet grassland; National Natural Reserve of étang de Saint Paul, La Réunion (photography by N. Juillet). **F**. Well vegetated ponds in Parc national d'Andasibe-Mantadia, Madagascar. **G**. Predation of a damselfly (*Africallagma glaucum*, Coenagrionidae) by *Dolomedes reuniascar* sp. nov. - Plaine des palmistes, La Réunion (photography by J.M. Tamon). **H**. Female (KPARA00174) with an egg sac, placed on a white background (photography by Kuang-Ping Yu). **I**. Empty nursery web that potentially belongs to *Dolomedes reuniascar* sp. nov. at the pond in Parc national d'Andasibe-Mantadia, Madagascar (photography by Kuang-Ping Yu). **J**. Nursery web with spiderlings - Plaine des palmistes, La Réunion (photography by J.M. Tamon). **K**. Same as for preceding, in details (photography by F. Henze).

behavior is documented in only a few taxa and is more commonly associated with web-building spiders (Bell *et al.* 2005), it is hypothesized that in Tetragnathidae, ballooning facilitates transoceanic dispersal (Gillespie *et al.* 1994). Although not extensively studied, ballooning has been observed in a few *Dolomedes* species, such as *D. triton* (Walckenaer, 1837) (Graham 2002; Frost *et al.* 2013). Following this scheme, and also considering the well-known rafting behavior observed in *Dolomedes* (Suter 1999), it could be possible that the tropical trade winds, ocean currents and hurricanes serve as pathways connecting the islands.

Contrary to the above hypothesis, human activity might also explain the dispersal of *Dolomedes reuniascar* sp. nov. between the two islands. Casquet (2011) hypothesized that humans might have introduced some spider taxa to La Réunion based on 1) their absence in historical literature by A. Vinson (1863) and J.-Cl. Ledoux (unpublished data); and 2) their presence usually around anthropic areas. Indeed, these sources did not report any *Dolomedes* species. However, we found a juvenile specimen that is identical to *D. reuniascar* sp. nov. in Ledoux's collection at MNHN (ref. 11596 KG, Fig. 14). If this human introduction hypothesis is correct, *D. reuniascar* sp. nov. may have reached La Réunion no later than 1950. It is also possible that the spider was introduced to Madagascar from La Réunion at an unknown time frame. To date, the origin and the biogeographic history of *D. reuniascar* sp. nov. remain unclear. Further studies on its dispersal behavior, tolerance to brackish water and more thoroughly sampled *Dolomedes* phylogeny are needed to further support these hypotheses.

Acknowledgments

We thank Hafsah Limbada (University of La Réunion Island) and Antoine Franck (CIRAD) for their technical collaboration in the lab. We acknowledge the National Nature Reserve (NNR) of étang de Saint Paul for their sampling permits, their support and their help on the field. A special thanks to Yvan Montardi (French Arachnology Association (Association Française d'Arachnologie (AsFRa))

Fig. 14. Specimen of a juvenile *Dolomedes* cf. *reuniascar* sp. nov. from La Réunion Island in Ledoux's collection (ref. 11596 KG, MNHN Paris). **A**. Dorsal view **B**. Ventral view. **C**. Lateral view. **D**. Eyes arrangement, frontal view. Scale bars: A–C = 1 mm. D = 0.5 mm.

and Christine Rollard (MNHN Paris) for their collaboration in obtaining photographs of the specimens from the Jean Claude Ledoux's collection. This study could not have been carried out without the collaboration of naturalists on La Réunion Island who shared photos, precious informations and relevant field observations: Jean Maurice Tamon, Antoine Baglan, Muriel Dietrich, Augustin Soulard, Guillaume Dupuy, Robin Noel, Nicole Crestey, Dominique Martiré and Fred Henze.

We express our deep gratitude to Tiana Vololona, Rinha Harin' Hala Rasolondalao and the staff at Madagascar's Institute for the Conservation of Tropical Ecosystems (MICET) for their help in the transportation and obtaining the research permits. We thank the local guides, the porters, and the students Annie Rasoanoeliarimanana and Jeremia Ravelojaona for their help in the field. We acknowledge our colleagues Matjaž Kuntner, Matjaž Gregorič, and Matjaž Bedjanič for their help in organizing the field trip and Reng-Chung Cheng for covering part of the sequencing costs. We would also like to express our gratitude to the Genomics Center for Clinical and Biotechnological Applications at the National Core Facility for Biopharmaceuticals, Taiwan (MOST 109-2740-B-010-002) for sequencing. Kuang-Ping Yu is supported by the Slovenian Research Agency (P1-0255). We thank the editor and the two anonymous reviewers for their useful suggestion to the manuscrits.

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Manuscript received: 4 April 2024
Manuscript accepted: 12 December 2024
Published on: 12 June 2025
Topic editor: Tony Robillard
Section editor: Nesrine Akkari
Desk editor: Thomas Guyomard

Printed versions of all papers are deposited in the libraries of four of the institutes that are members of the *EJT* consortium: Muséum national d'Histoire naturelle, Paris, France; Meise Botanic Garden, Belgium; Royal Museum for Central Africa, Tervuren, Belgium; Royal Belgian Institute of Natural Sciences, Brussels, Belgium. The other members of the consortium are: Natural History Museum of Denmark, Copenhagen, Denmark; Naturalis Biodiversity Center, Leiden, the Netherlands; Museo Nacional de Ciencias Naturales-CSIC, Madrid, Spain; Leibniz Institute for the Analysis of Biodiversity Change, Bonn – Hamburg, Germany; National Museum of the Czech Republic, Prague, Czech Republic; The Steinhardt Museum of Natural History, Tel Aviv, Israël.

Supplementary files

Supp. file 1. Sequences used for genetic analysis. https://doi.org/10.5852/ejt.2025.997.13231

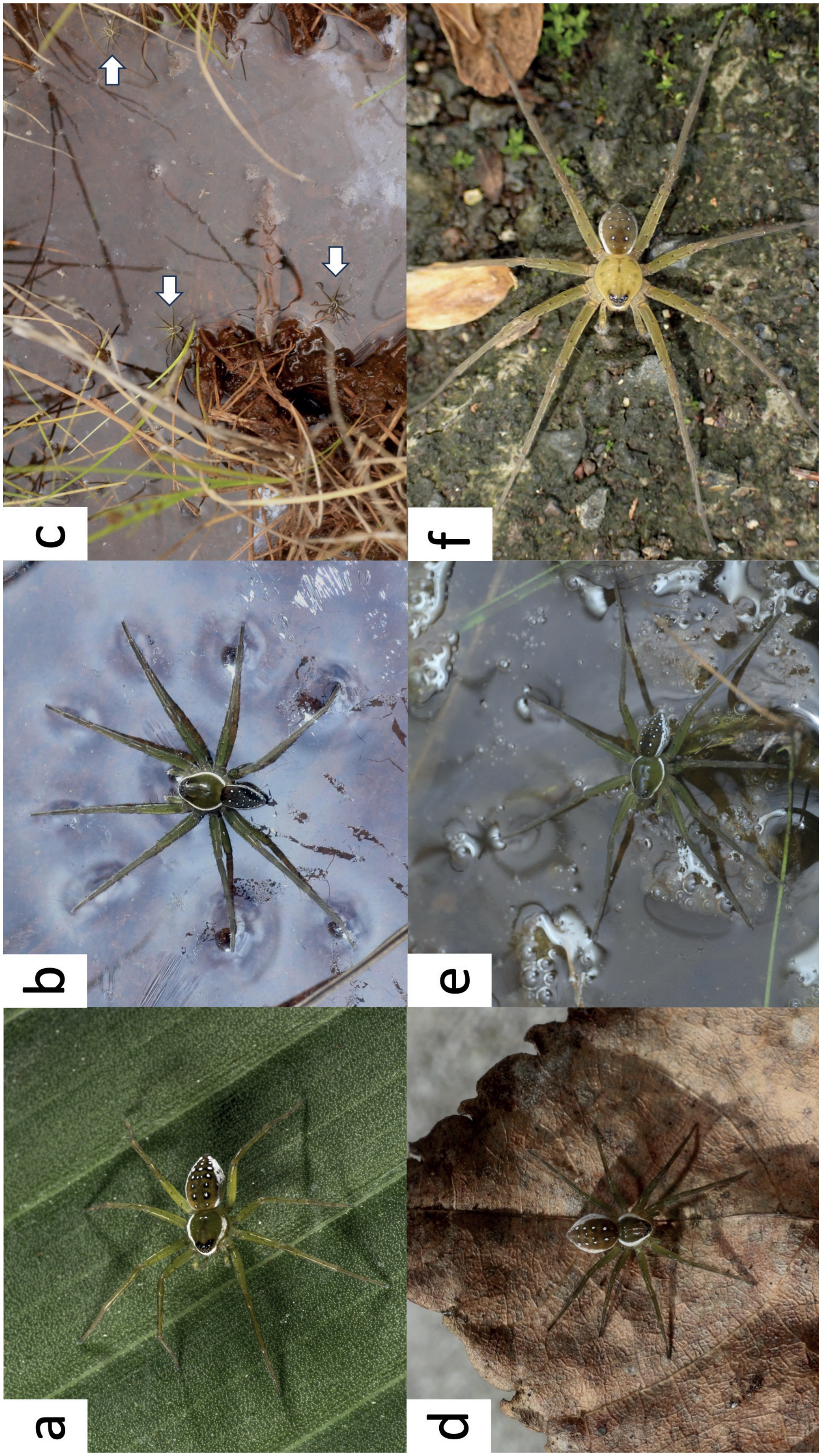
Supp. file 2. Sequences of *Dolomedes reuniascar* sp. nov. uploaded in GenBank. https://doi.org/10.5852/ejt.2025.997.13233

Supp. file 3. Genetic distances in *Dolomedes reuniascar* sp. nov. according to the gene sequence COI and 28S. https://doi.org/10.5852/ejt.2025.997.13235

Appendix 1

Photographs of *Dolomedes reuniascar* sp. nov.

FRANCE – **La Réunion** • 1 juvenile; Sainte Suzanne, Bocage; 20°54′36.72″ S, 55°36′43.92″ E; 6 m a.s.l.; 01 Oct. 2018; based on photography by Baglan A.; det. Cazanove G.; Appendix 1a • 1 juvenile; Plaine des Palmistes, near the "Pyramide"; 21°7′3.36″ S, 55°38′38.76″ E; 901 m a.s.l.; 24 Apr. 2021; *Pandanus* forest, on sight; based on photography by Tamon J.M.; det. Cazanove G., Appendix 1b • 3 juveniles; Plaine des Palmistes, near the "Pyramide"; 21°7′3.36″ S, 55°38′38.76″ E; 901 m a.s.l.; 7 Dec. 2021; *Pandanus* forest, on sight; based on photography by Tamon J.M.; det. Cazanove G.; Appendix 1c; (arrows) • 1 juvenile; Plaine des Palmistes, Tamon's house; 21°7′41.16″ S, 55°38′8.159″ E; 954 m a.s.l.; 22 Nov. 2021; garden, on sight; based on photography by Tamon J.M.; det. Cazanove G.; Appendix 1d • 1 unsexed specimen; Plaine des Palmistes, near the "Pyramide"; 21°7′3.36″ S, 55°38′38.76″ E; 901 m a.s.l.; 29 Jan. 2022; *Pandanus* forest, on sight; based on photography by Tamon J.M.; det. Cazanove G.; Appendix 1e • 1 unsexed specimen; Plaine des Palmistes, Petite Plaine, Ravine Bras Noir; 21°7′3.36″ S, 55°38′38.76″ E; 1100 m a.s.l.; 19 Mar. 2022; *Pandanus* forest, on sight; based on photography by Tamon J.M.; det. Cazanove G.; Appendix 1f • 1 juvenile; Plaine des Palmistes, near the "Pyramide"; 21°7′3.36″ S, 55°38′38.76″ E; 901 m a.s.l.; 15 Dec. 2022, *Pandanus* forest, on shrub at 1 m height, on sight; based on photography by Tamon J.M.; det. Cazanove G.; Appendix 1g • 1 unsexed specimen; Plaine des Palmistes, near the "Pyramide"; 21°7′3.36″ S, 55°38′38.76″ E; 901 m a.s.l.; 1 May 2022, *Pandanus* forest, on sight; based on photography by Tamon J.M.; det. Cazanove G.; Appendix 1h • 1 juvenile; Plaine des Palmistes, near the "Pyramide"; 21°7′3.36″ S, 55°38′38.76″ E; 901 m a.s.l.; 4 Jun. 2022; *Pandanus* forest, on sight; based on photography by Tamon J.M.; det. Cazanove G.; Appendix 1i–j • 1 juvenile; Saint Paul, Savannah; 20°59′24.36″ S, 55°17′34.44″ E; 4 m a.s.l.; 08 May 2021; wet zone, on sight; based on photography by Soulard A.; det. Derepas B.; Appendix 1k (https://www.inaturalist.org/observations/79498880) • 1 juvenile; Entre Deux, Bras long, Cemetery street, edge of creek; 21°15′11.88″ S, 55°28′17.76″ E; 332 m a.s.l.; 10 Feb. 2022; on sight; based on photography by Noel R.; det. Derepas B.; Appendix 1l (https://www.inaturalist.org/observations/125839877) • 1 juvenile; Saint Paul, Etang Saint Paul; 20°59′14.28″ S, 55°17′7.079″ E; 10 m a.s.l.; 04 Jun. 2019; edge of pond, on sight; based on photography by Dupuy G.; det. Derepas B.; Appendix 1m (https://www.inaturalist.org/observations/50766376) • 1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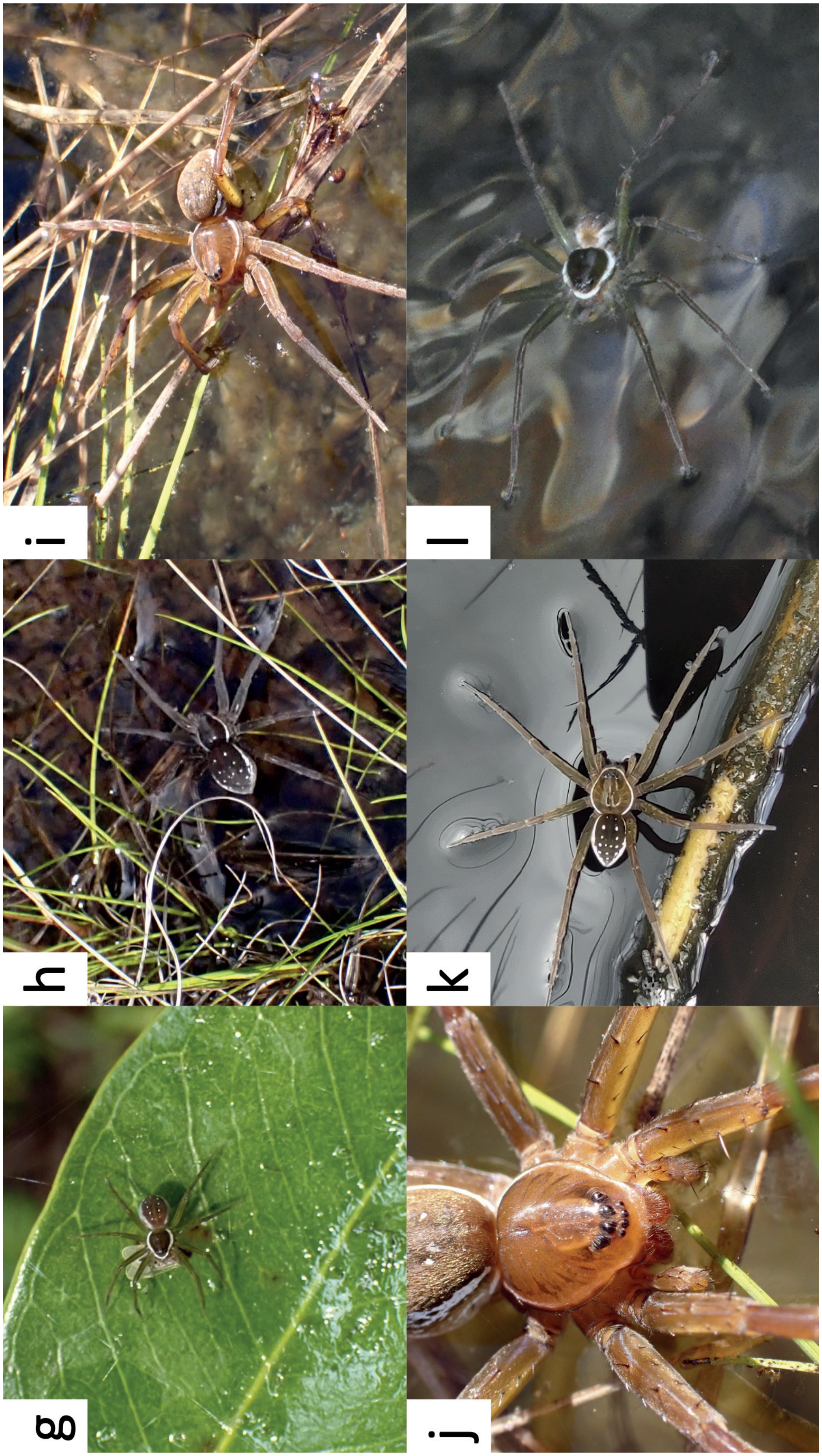
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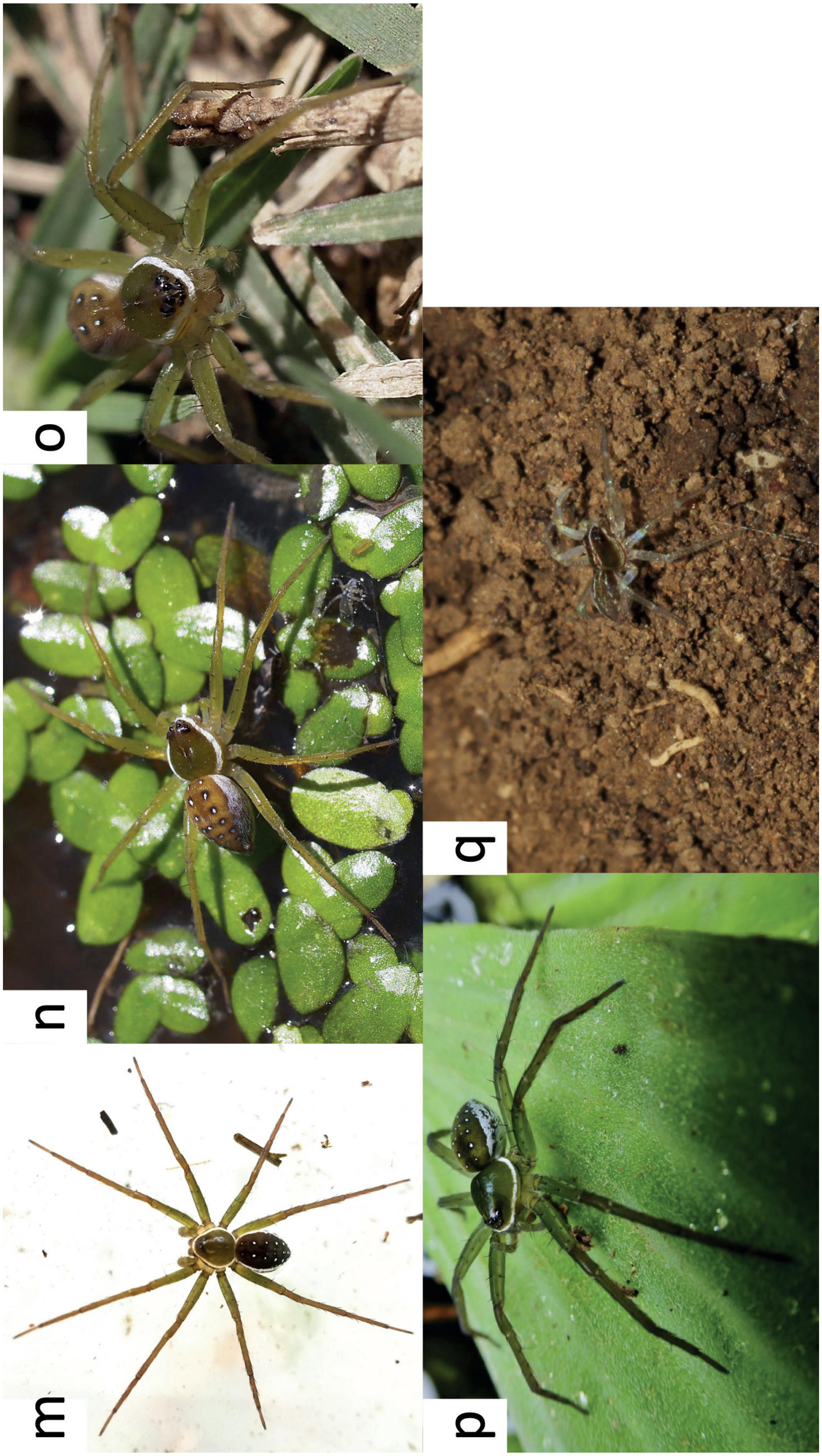
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unsexed specimen; Saint Louis, Roches Maigres, Leconte de Lisle Street, waterfront; 21°16′0.12″ S, 55°25′0.119″ E; 165 m a.s.l.; 15 Oct. 2011; on sight; based on photography by Martiré D.; det. Derepas B.; Appendix 1n–o (https://www.insecte.org/forum/viewtopic.php?t=86657) • 1 juvenile; Saint Paul, Etang Saint Paul; 20°59′13.92″ S, 55°16′55.92″ E; 10 m a.s.l.; 30 Jul. 2019; edge of pond; based on photography by Crestey N.; det. Derepas B.; Appendix 1p • 1 juvenile (early stages); Saint Paul, Etang St Paul; 20°59′31.92″ S, 55°17′59.64″ E; 8 m a.s.l.; 15 Feb. 2017; on sight, based on photography by Cazanove G.; det. Cazanove G; Appendix 1q.

Other records, not examined

Even if there are not physical samples, other records can be associated with the species on La Réunion because, in the current state of knowledge, there is not other known species of spiders that share the same habitus and ecology with *Dolomedes reuniascar* sp. nov.

FRANCE – **La Réunion** • undetermined number of specimens (not collected); Saint Louis, Etang du Gol; undetermined date; obs. Casquet J. (Casquet 2011) • undetermined number of specimens (not collected); Salazie, Mare à poule d'eau, undetermined date; obs. Casquet J. (Casquet 2011) • 1 juvenile (not collected); Bras Panon, Rivière du Mât, Rivière du Mât riverside park; 20°58′46.2″ S, 55°38′20.759″ E; 125 m a.s.l.; 25 Jul. 2020; wet zone; obs. Derepas B. • 10 juveniles (not collected); Bras Panon, Rivière du Mât, Rivière du Mât riverside park; 20°58′46.2″ S, 55°38′20.759″ E; 126 m a.s.l.; 23 Jan. 2021, wet zone, obs. Dietrich M. • 58 juveniles (not collected); Salazie, Mare à poule d’eau; 21°3′5.4″ S, 55°31′31.439″ E; 669 m a.s.l.; 2 Nov. 2022; *Pistia stratiotes*, beating; obs. Derepas B.