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## ● A new intertidal genus and species of Dictynidae (Araneae: Dictynoidea) from Hainan, China

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**Abstract:** A new intertidal genus of the spider family Dictynidae O. Pickard-Cambridge, 1871, *Maretyna* **gen. nov.**, is described from Hainan, China, with *M. nongchao* **sp. nov.** as the type species. Photos and morphological description of the new species and its habitat are presented.

**Keywords:** Asia, diagnosis, endemic, Intertidal, taxonomy

## ● 中国海南潮间带卷叶蛛科（蜘蛛目：卷叶蛛总科）一新属及一新种

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**摘要:** 本文记述了采自中国海南潮间带的卷叶蛛科（Dictynidae O. Pickard-Cambridge, 1871）一新属：海卷叶蛛属 *Maretyna* **gen. nov.**，模式种为弄潮海卷叶蛛 *M. nongchao* **sp. nov.**。文中提供了该新种的形态学描述、生态照片及其生境信息。

**关键词:** 亚洲，鉴别特征，特有种，潮间带，分类学

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## ● Introduction

Dictynidae O. Pickard-Cambridge, 1871 is a medium-sized, worldwide family of spiders. After a systematic revision (Montana *et al.* 2025), it currently comprises 44 genera and 338 species, with 77 species recorded from Asia, and among those, 11 genera with 33 species from China. The study of Dictynidae in China is relatively comprehensive. Twenty-two species are known from both sexes, nine are known from only females and two from only males (WSC 2025). Notably, among the 11 species described from a single sex, six were published by Hu (2001). In the past decade, six new species have been described in the genus *Sudesna* Lehtinen, 1967 (Wang *et al.* 2025), and more new species of this family are expected to be discovered in the future.

The intertidal zone is a special habitat, where strong environmental selection and unique community structure have led to the evolution of many specialized species. Intertidal spiders are mostly assigned to Argyronetidae Thorell, 1869, Desidae Pocock, 1895, and Toxopidae Hickman, 1940 (Crews *et al.* 2020). In mainland China, including Hainan, only four intertidal species are known from three genera: *Desis jiaxiangi* Lin, Li & Chen, 2020, *Diplocanthopoda marina* Abraham, 1925, *Paratheuma insulana* (Banks, 1902) and *P. shirahamaensis* (Oi, 1960) (Lin *et al.* 2020; Wang & Zhang 2023; Lin 2024).

Hainan Province lies entirely in the tropics, and most of the region has a tropical monsoon climate and very rich biodiversity. However, recent studies have mostly focused on several well-known mountains (such as Jianfeng Mt., Wuzhi Mt. and Diaoluo Mt.), while the coastlines of Hainan have long been neglected. During our collections in Hainan, we discovered a new intertidal dictynid genus, *Maretyna* **gen. nov.** To date, no intertidal species have been reported in Dictynidae. The habitat of this new species is completely submerged at high tide, suggesting that it may have special evolutionary adaptations (Fig. 1D). In this paper, we describe this remarkable new genus with its type species, *Maretyna nongchao* **sp. nov.**

## ● Material and methods

All specimens were preserved in 80% ethanol. Specimens were examined using an OLYMPUS SZX7 stereo microscope. Photographs were taken with a LEICA M205 C stereo microscope, and final multifocal images were produced with Helicon Focus (Version 7.7.0). The epigyne was removed and treated in a warm 0.1 mg/ml Protease K solution before study. All morphological measurements were calculated using the LEICA M205 C stereo microscope. Body length measurements do not include the chelicerae. Eye diameters were measured at the widest points. Leg measurements are given as: total length (femur, patella, tibia, metatarsus, tarsus). All measurements are in millimeters (mm). The terminology used in the text and figures follows Montana *et al.* (2025). The species delimitation in this paper is based on the Ecological Species Concept and Biological Species Concept (De Queiroz K, 2007).

Types from the current study are deposited in the Institute of Zoology, Chinese Academy of Sciences in Beijing (IZCAS).

Abbreviations used in the text: **AER** anterior eye row; **ALE** anterior lateral eye; **AME** anterior median eye; **PER** posterior eye row; **PLE** posterior lateral eye; **PME** posterior median eye; **RTA** retrolateral tibial apophysis.

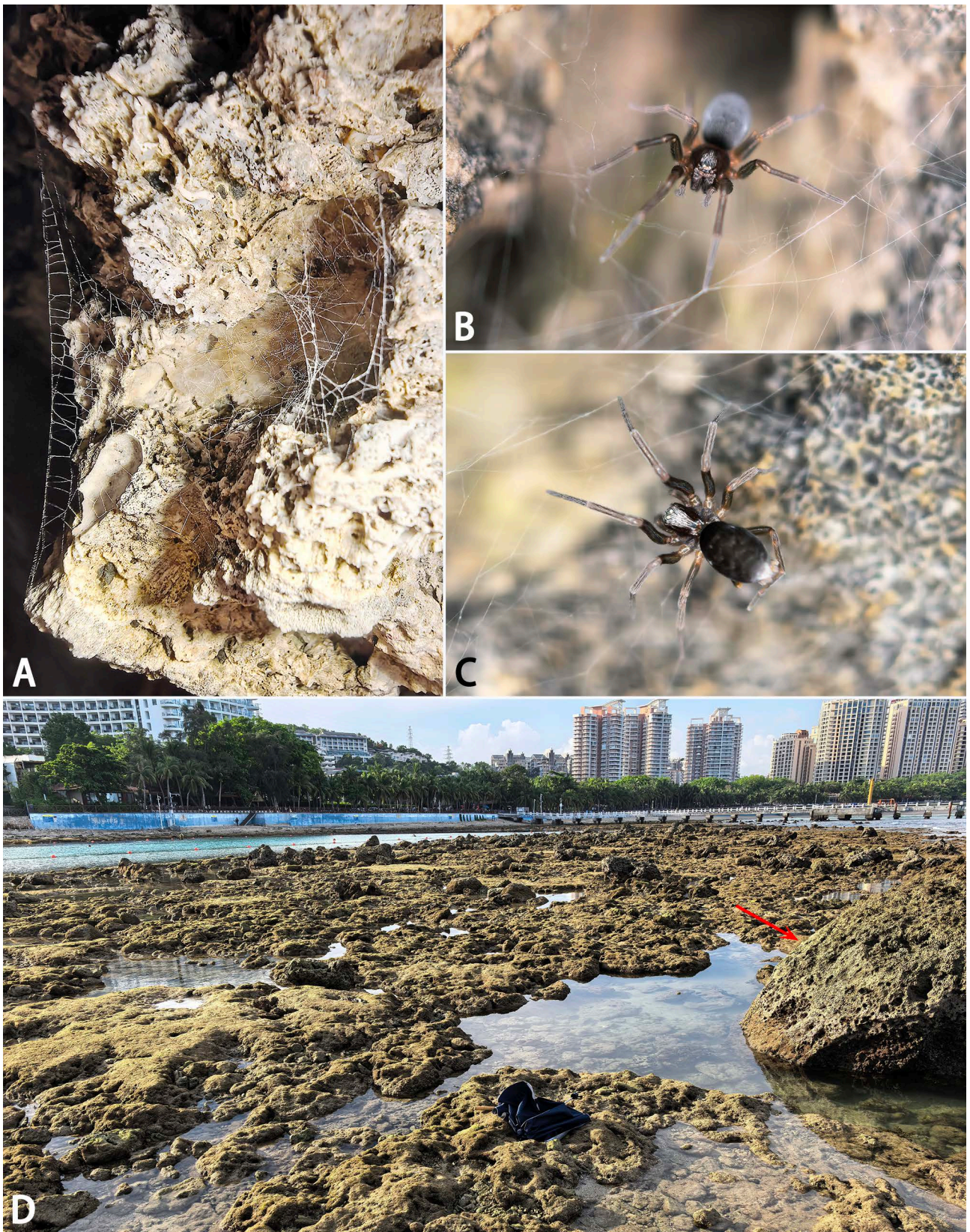
## ● Taxonomy

### Family Dictynidae O. Pickard-Cambridge, 1871

#### Genus *Maretyna* **gen. nov.** 海卷叶蛛属

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**Type species.** *Maretyna nongchao* **sp. nov.** from Hainan, China.



**FIGURE 1.** *Maretyna nongchao* sp. nov., living specimens: **A** Web **B** Female paratype **C** Male paratype, spinning web **D** Habitat (red arrow shows where the spiders were found).

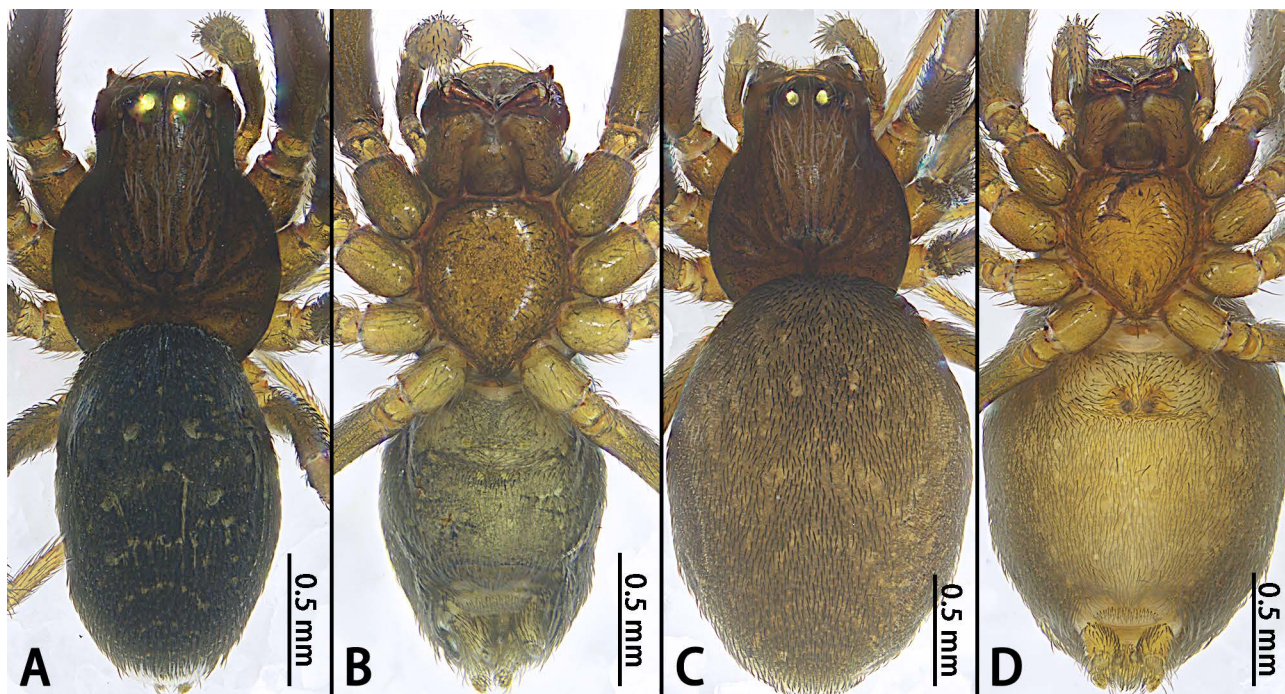
**Diagnosis.** Males of *Maretyna* **gen. nov.** is similar to *Arangina* Lehtinen, 1967 by the paraconductor process originating at the base of the conductor lower arm and conductor scaly tip without coiling (Fig. 4 A, B, G, H and Montana *et al.* 2025: fig. 44A–F). However, it can be distinguished from *Arangina* by the cymbium apex abruptly narrowed, length almost equal to bulb (Fig. 4B) [vs. cymbium apex nearly equilateral-triangular, length almost half of bulb (see Forster 1970: figs 359, 369, 370 and Montana *et al.* 2025: fig. 44C)], conductor upper arm as long as the lower arm (Fig. 4B) [vs. conductor upper arm longer than the lower arm (see Montana *et al.* 2025: fig. 44C)] and embolus originating at approximately 11-o'clock position [vs 8-o'clock position (see Forster 1970: figs 359, 369, 370 and Montana *et al.* 2025: fig. 44C)].

Females can be distinguished from all other genera by the epigyne lacks a coiled copulatory duct and the length ratio of the spermathecae to the expanded copulatory duct is 2:1 (Fig. 5B).

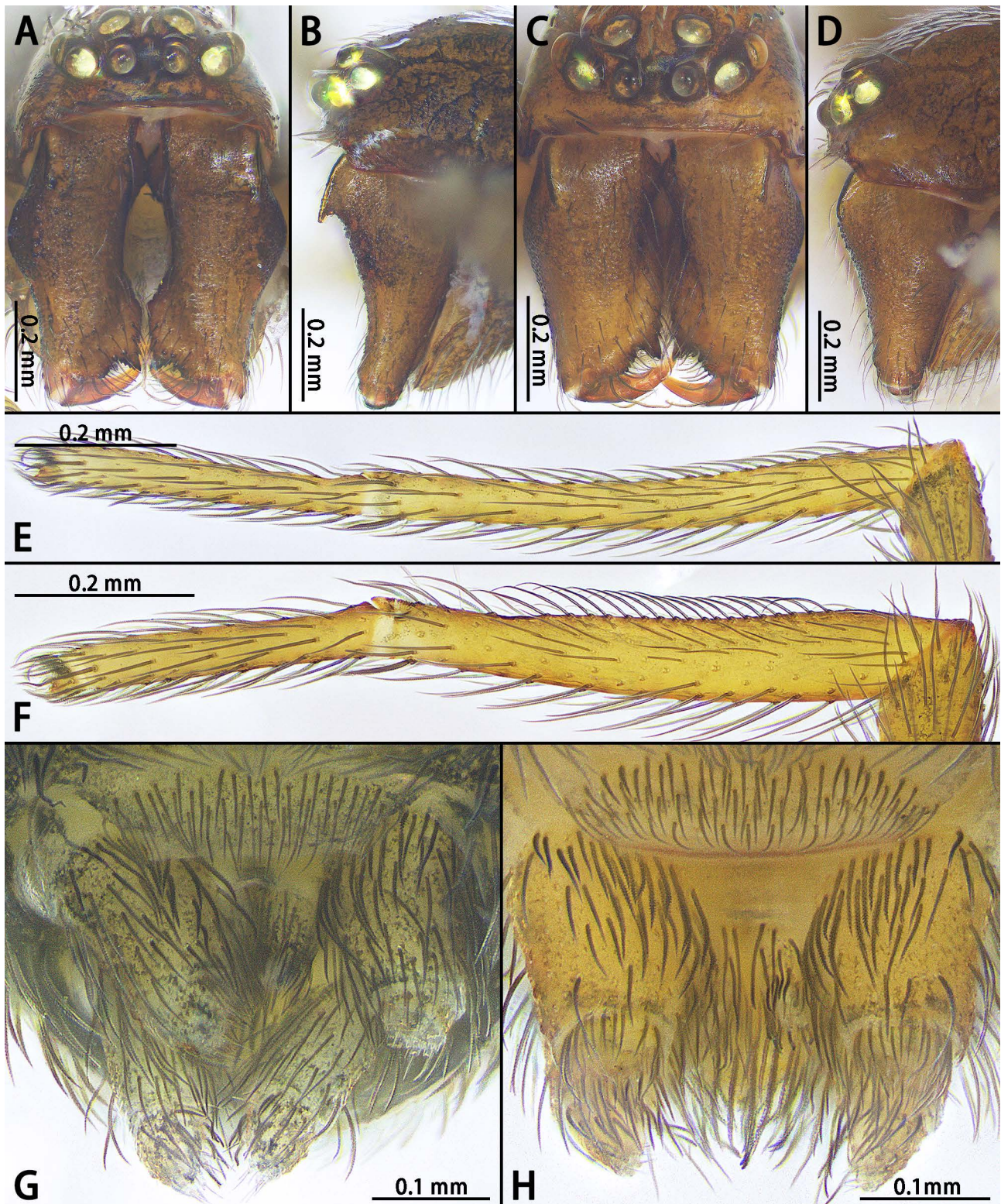
**Description.** Male. Total length 2.22–2.27 ( $n = 2$ ). Carapace dark brown, cephalic region with a few white setae. PER longer than AER; AER procurved and PER slightly procurved. AMEs separated by almost their diameter, approximately as far from ALEs; PMEs separated by almost their diameter, approximately as far from ALEs. Distance between AMEs and PMEs greater than that between ALEs and PLEs. ALEs and PLEs separated by less than the ALE diameter. Clypeus dark brown, with a few black setae. Chelicerae dark brown, with 3 promarginal teeth and 1 retromarginal tooth; the middle promarginal tooth largest, with 3–4 denticles. Endites and labium dark brown, with a few black setae. Sternum same color as endites, with black setae. Legs brown; calamistrum half as long as metatarsus IV. Opisthosoma oval, brown. Cribellum undivided; spinnerets brown.

Palpal femur ca 3× longer than patella. Patella shorter than tibia. Dctynid process with two ctenidia. RTA hood shaped. Cymbium pyriform. Bulb discoid, round. Sperm duct running along the margin of the tegulum. Conductor upper arm as long as lower arm. Embolus whiplike, arising at approximately 11-o'clock.

Female. Total length 2.59–2.61 ( $n = 5$ ). Somatic characters as in male, but lacking horn on cheliceral condyle; calamistrum as long as metatarsus IV.



**FIGURE 2.** *Maretyna nongchao* sp. nov., habitus: **A** Male holotype, dorsal view **B** Same, ventral view **C** Female paratype, dorsal view **D** Same, ventral view.



**FIGURE 3.** *Maretyna nongchao* sp. nov., frontal part of prosoma (A–D), leg IV (E, F) and cribellum (G, H): A Male holotype, frontal view B Same, lateral view C Female paratype, frontal view D Same, lateral view. E Male holotype, lateral view F Female paratype, lateral view G Male holotype H Female paratype.

Epigynal plate triangular. Copulatory openings located posteriorly, distinct, separated from each other. Copulatory ducts long, with one small coil and one hairpin turn, distal part laminar, expanded. Spermathecae oval, located posteriorly, separated by less than their radius. Fertilization ducts long, almost equal to spermathecal

diameter.

**Etymology.** The new generic name is a combination of *mare* (Latin for marine) and *Dictyna*. The gender is feminine.

**Variation.** Males (n = 2) total length 2.22–2.27, females (n = 5) total length 2.59–2.91.

**Composition.** Monotypic: *Maretyna nongchao* sp. nov.

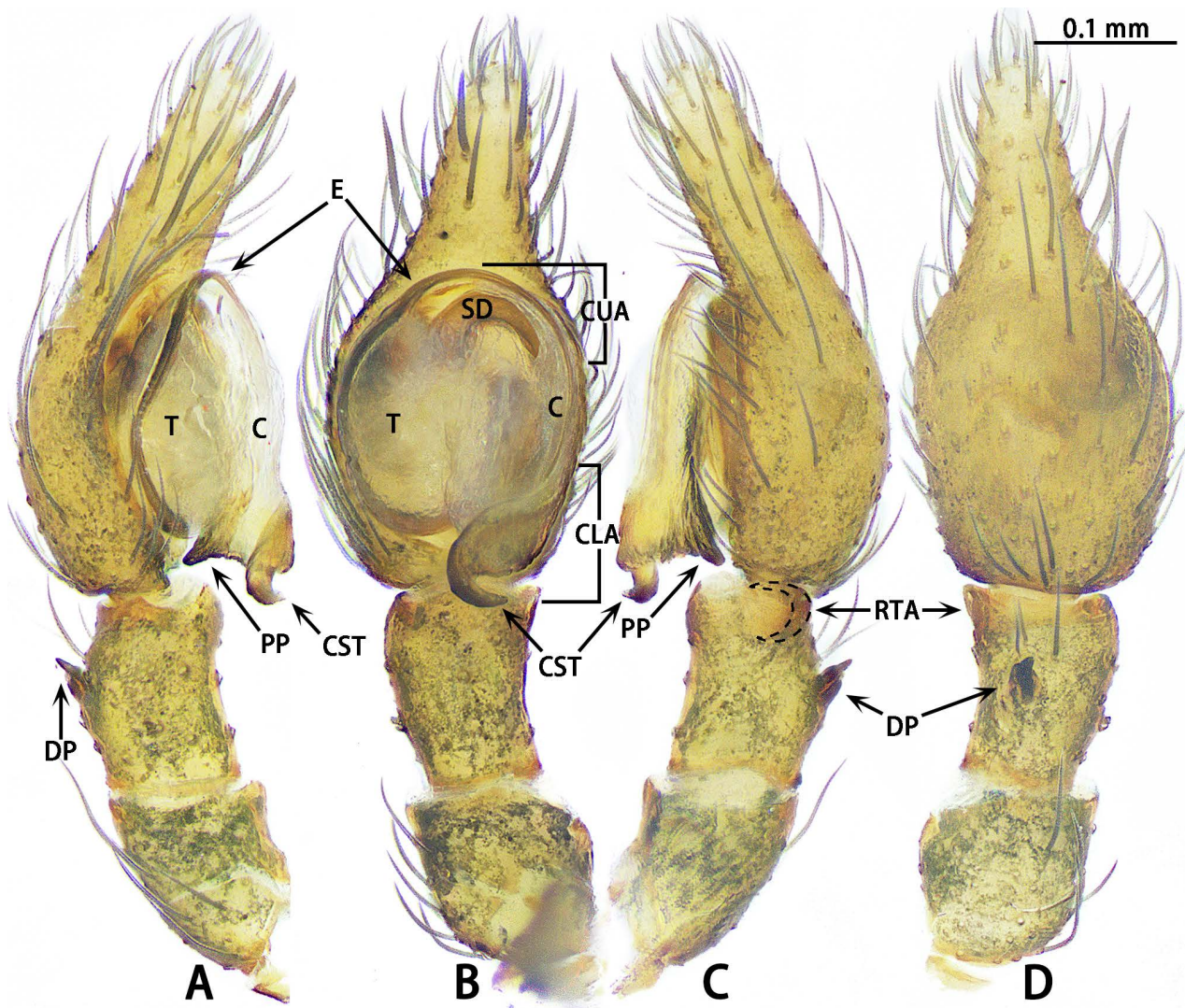
**Distribution.** China (Hainan).

***Maretyna nongchao* sp. nov.** 弄潮海卷叶蛛

<https://zoobank.org/F0B2F6F9-579C-4CF3-9088-FE3AF28CEFD0>

Figs 1A–D, 2A–D, 3A–H, 4A–D, 5A, B

**Type materials.** *Holotype*: ♂ (IZCAS-Ar45901), CHINA: *Hainan*: Sanya City, Jiyang District, Dadonghai, N18.2180°, E109.5151°, elev. -3 m, 25.VII.2025, Bo Liu & Weihang Wang leg. *Paratypes*: 1♂5♀ (IZCAS-Ar45902–Ar45907), same data as holotype.



**FIGURE 4.** *Maretyna nongchao* sp. nov., palp of the holotype male: **A** Prolateral view **B** Ventral view **C** Retrolateral view **D** Dorsal view. C = conductor; CLA = conductor lower arm; CST = conductor scaly tip; CUA = conductor upper arm; DP = dictynid process; E = embolus; PP = paraconductor process; RTA = retrolateral tibial apophysis; SD = sperm duct; T = tegulum.

**Diagnosis.** Same as for the genus.

**Description.** Male (holotype; Figs 2A, B, 3A, B, E, G, 4A–D). Total body length 2.27. Carapace 1.05 long, 0.87 wide; opisthosoma 1.32 long, 0.86 wide. AER procurved, PER procurved slightly. Eye sizes and interdistances: AME 0.06, ALE 0.07, PME 0.07, PLE 0.06; AME–AME 0.05, AME–ALE 0.03, PME–PME 0.07, PME–PLE 0.06, AME–PME 0.04, ALE–PLE 0.02, AME–PLE 0.10, PME–ALE 0.05. Leg measurements: I 3.75 (1.14, 0.27, 1.01, 0.82, 0.51); II 3.37 (1.04, 0.28, 0.83, 0.73, 0.49); III 2.66 (0.81, 0.25, 0.59, 0.62, 0.39); IV 2.77 (0.76, 0.22, 0.67, 0.71, 0.41).

Coloration (Fig. 2A, B). Carapace dark brown, with light brown radiating marks. Fovea indistinct. Chelicerae, labium, gnathocoxae, and sternum dark brown. Legs yellow brown. Opisthosoma oval, dark brown, with indistinct arrow-shaped pattern; anterolateral and posterior margins with white setae, venter yellow brown without pattern. Cribellum and spinnerets yellow brown.

Palp (Fig. 4A–D). Patella slightly longer than wide. Tibia 1.5× times longer than wide, with dictynid process (DP) dorsally; RTA indistinct, hood-shaped. Cymbium teardrop-shaped, ca twice as long as wide. Sperm duct (SD) long, running along the margin of the tegulum, forming a ~240° clockwise loop. Conductor upper arm (CUA) curved, membranous, ca as long as conductor (C) lower arm; conductor scaly tip (CST) hook-shaped, not coiled; paraconductor process (PP) indistinct in ventral view. Embolus (E) with base arising at 11-o'clock position; tip concealed by the conductor scaly tip (CST).

Female (paratype IZCAS-Ar45907; Figs 1A, B, 2C, D, 3C, D, F, H, 5A, B). Total body length 2.75. Carapace 1.09 long, 0.92 wide; opisthosoma 1.81 long, 1.37 wide. AER and PER procurved slightly. Eye sizes and interdistances: AME 0.07, ALE 0.07, PME 0.07, PLE 0.07; AME–AME 0.05, AME–ALE 0.03, PME–PME 0.07, PME–PLE 0.06, AME–PME 0.05, ALE–PLE 0.02, AME–PLE 0.11, PME–ALE 0.06. Leg measurements: I 3.47 (1.09, 0.31, 0.89, 0.71, 0.47); II 3.08 (0.98, 0.28, 0.74, 0.66, 0.42); III 2.43 (0.79, 0.23, 0.52, 0.55, 0.34); IV 2.70 (0.85, 0.26, 0.60, 0.63, 0.36).

Coloration (Fig. 2C, D). As in male.

Epigyne (Fig. 5A, B). Epigynal plate 1.65× wider than long. Copulatory openings (CO) located posteriorly, well separated. Copulatory ducts (CD) intertwined, basal part sharply twisted, distal part of copulatory ducts (CD) expanded; connected to spermathecae (S) ventrally. Spermathecae (S) oval, as wide as the expanded distal part of copulatory ducts (CD), 3× wider than copulatory openings (CO). Fertilization ducts (FD) directed at 1:30-o'clock position from spermathecae (S).

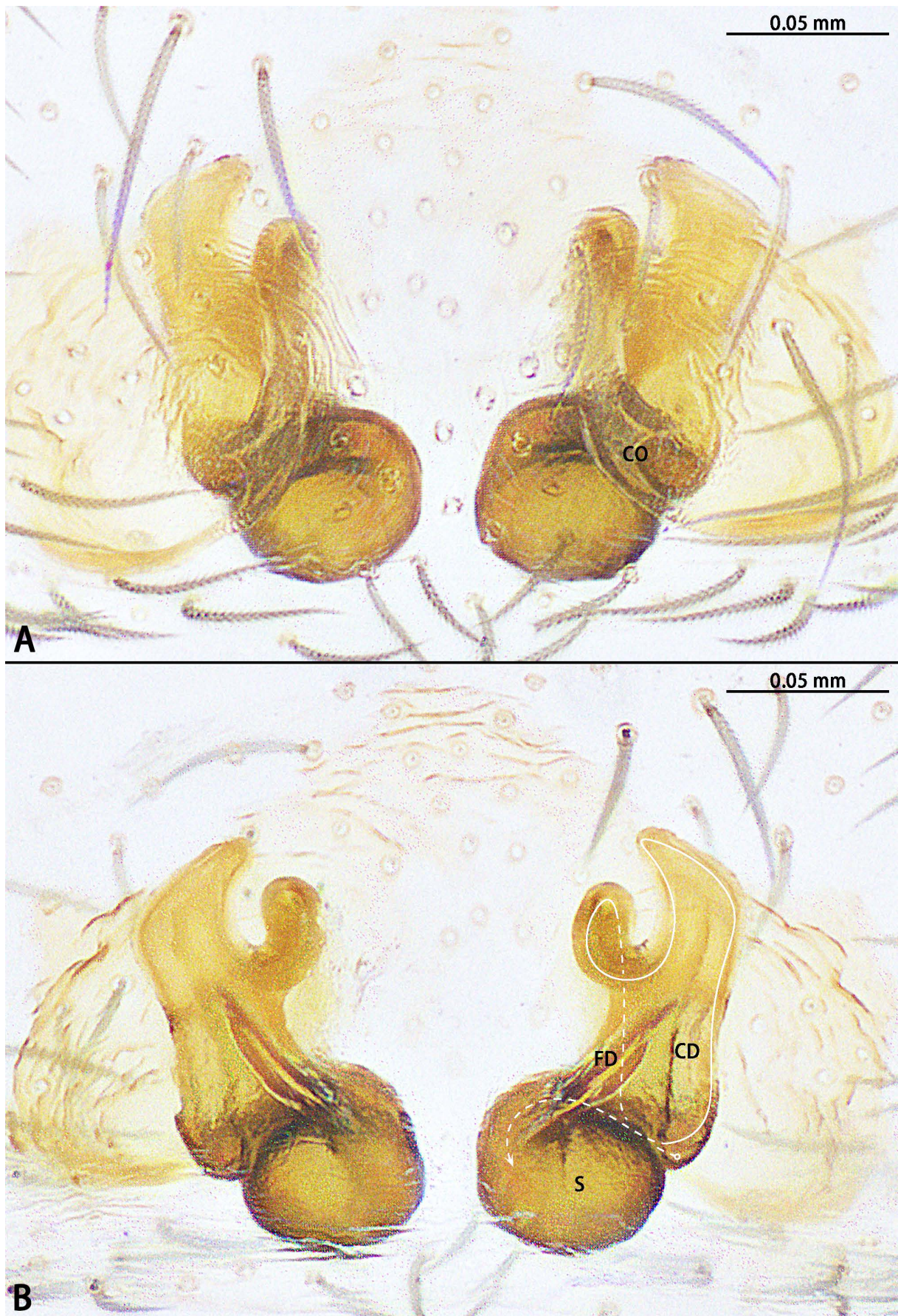
**Etymology.** The specific epithet is derived from the Chinese Pinyin 'nòng cháo' meaning 'play in the water', referring to the habitat of this species; noun in apposition.

**Distribution.** Known only from the type locality.

**Natural History.** This species inhabits the intertidal zone, which is submerged at high tide. Individuals are nocturnal and construct webs on rocks to capture small Diptera. When the tide covers the habitat, spiders retreat into silken retreats built within crevices of large stones. (Fig. 1A–D).

## ● Discussion

In the intertidal zone of Hainan, *Desis jiaxiangi*, *Diplocanthopoda marina* and *Paratheuma insulana* hunt after the tide recedes, mainly feeding on amphipods and polychaetes, and occasionally catching small Diptera that fall onto the water surface. Before this study, no web-building spiders had been reported from the intertidal zone in China. The discovery of *Maretyna nongchao* sp. nov. demonstrates web-building spiders can also inhabit intertidal zone. This may suggest that differences in ecological niches have driven species diversification, with web-building being a necessary strategy for capturing flying prey in the intertidal environment. Future surveys targeting intertidal microhabitats are expected to reveal additional intertidal spider species.



**FIGURE 5.** *Maretna nongchao* sp. nov., macerated epigyne of the paratype female: **A** Ventral view **B** Dorsal view. Abbreviations: CD = copulatory duct; CO = copulatory opening; FD = fertilization duct; S = spermatheca.

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## ● References

- Crews SC, Garcia EL, Spagna JC, Van Dam MH & Esposito LA 2020: The life aquatic with spiders (Araneae): repeated evolution of aquatic habitat association in Dictynidae and allied taxa. *Zoological Journal of the Linnean Society* 189 (3): 862–920 & Suppl. <https://doi.org/10.1093/zoolinnean/zlz139>
- De Queiroz K 2007: Species concepts and species delimitation. *Systematic biology*, 56 (6): 879–886. <https://doi.org/10.1080/10635150701701083>
- Forster RR 1970: The spiders of New Zealand. Part III. *Otago Museum Bulletin*, 3: 1–184.
- Hu J-L 2001: *Spiders in Qinghai-Tibet Plateau of China*. Henan Science and Technology Publishing House, Zhengzhou, 658 pp. [胡金林 2001: 青藏高原蜘蛛. 河南科学技术出版社, 郑州, 658 pp.]
- Lin Y-J 2024: Taxonomy notes on twenty-five spider species (Arachnida: Araneae) from China. *The Indochina Entomologist*, 1 (6): 35–48. <https://doi.org/10.70590/ice.2024.01.06>
- Lin Y-J, Li S-Q & Chen H-F 2020: First report of the spider genus *Desis* (Araneae, Desidae) from China, with description of a new species. *Zootaxa*, 4755 (3): 593–597. <https://doi.org/10.11646/zootaxa.4755.3.11>
- Montana KO, Cala-Riquelme F, Crews SC, Gorneau JA, Al-Jamal AM, Alequín LD, Spagna JC, Ballarin F & Esposito LA 2025: Tailor's drawer no more: a reappraisal of the spider family Dictynidae O. Pickard-Cambridge, 1871 sensu lato. *Zoological Journal of the Linnean Society*, 204 (2) [zlaf007]: 1–97. <https://doi.org/10.1093/zoolinnean/zlaf007>
- Wang L-Y, Peng X-J & Zhang Z-S 2025: Six new species and a new synonym of the mesh-web spider genus *Sudesna* Lehtinen, 1967 (Araneae, Dictynidae) from China. *ZooKeys*, 1234: 127–149. <https://doi.org/10.3897/zookeys.1234.145300>
- Wang W-H & Zhang J-X 2023. First record of the intertidal jumping spider *Diploanthopoda marina* Abraham, 1925 from China (Araneae: Salticidae: Salticinae). *Acta Arachnologica Sinica*, 32 (1): 31–36. [王苇杭 张俊霞 2023: 滨海蝇獭在中国的首次报道(蜘蛛目:跳蛛科:跳蛛亚科). 蛛形学报, 32 (1): 31–36.] <https://doi.org/10.3969/j.issn.1005-9628.2023.01.006>
- World Spider Catalog 2025: *World Spider Catalog. Version 26*. Natural History Museum Bern. Available from: <http://wsc.nmbe.ch/> (accessed 24.VIII.2025). <https://doi.org/10.24436/2>

## ● Additional information

**Author contributions:** The author solely contributed to this work.

**Conflict of interest:** The author has declared that no competing interests exist.

**Data availability:** All of the data that support the findings of this study are available in the main text.

**Ethical statement:** No ethical statement was reported.

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