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# First country record of *Tylototriton koliaensis* Poyarkov et al., 2024 (Caudata, Salamandridae) from Guangxi, China

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**Abstract.** The crocodile newt *Tylototriton koliaensis* Poyarkov, Nguyen, Le, Le, Arkhipov, Gorin, Hernandez & Dufresnes, 2024 was recently described from northern Vietnam. Here, we report the first country record of this species from China, based on specimens from Bainan Township, Napo County, Guangxi Zhuang Autonomous Region. Both molecular and morphological evidence supports the identification of the Chinese specimens as *T. koliaensis*. This record improves our understanding of the diversity and distribution of *Tylototriton* Anderson, 1871 in Guangxi and highlights the need for further herpetological surveys in the biodiverse China–Vietnam border region.

**Keywords.** China–Vietnam border, crocodile newt, geographic distribution, new record, range extension

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## Introduction

The China–Vietnam border region is characterized by a highly heterogeneous landscape, with complex mountain systems and drainage networks that support exceptionally high amphibian diversity (Poyarkov et al. 2021a; Xu et al. 2024). However, historically limited herpetological surveys in this region has hindered a comprehensive understanding of regional amphibian diversity, with many new species and new distributional records discovered only in recent years (Luong et al. 2021, 2022; Du et al. 2022; Li et al. 2022; Wang et al. 2022; Liu et al. 2024; Nguyen et al. 2024, 2025; Kilunda et al. 2025; Pham et al. 2025, 2026).

The genus *Tylototriton* Anderson, 1871, commonly known as crocodile newts, currently comprises 46 recognized species distributed from the Pan-Himalayan region, throughout northern India, Myanmar, and southern China, to the Indochinese Peninsula (Poyarkov et al. 2024; Frost 2026; Xiao et al. 2026). This genus is particularly species-rich along the China–Vietnam border and has been responsible for several recent new amphibian discoveries in this region (Liu et al. 2022; Poyarkov et al. 2024; Xiao et al. 2026). *T. koliaensis* Poyarkov, Nguyen, Le, Le, Arkhipov, Gorin, Hernandez & Dufresnes, 2024 was described based on type specimens from Cao Bang Province, Vietnam and recorded in three localities in northern Vietnam (Poyarkov et al. 2024)

During our herpetological surveys in Guangxi Zhuang Autonomous Region (Guangxi ZAR), southwestern China in March 2026, four *Tylototriton* specimens were collected from the Chinese side of the China–Vietnam border region. Molecular phylogenetic and morphological analyses revealed that these specimens represent *T. koliaensis*. Based on these results, herein, we report this species for the first time in China as a new country record and update the known geographical range.

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## Methods

**Sampling.** Four *Tylototriton* specimens were collected from Bainan Township, Napo County, Baise City, Guangxi ZAR, China (Figure 1). Geographic coordinates (using the WGS84 datum) and elevation were recorded at the collection site. For conservation purposes, the precise location is not reported here and will be made available only to qualified researchers upon request. The specimens were euthanized with tricaine methanesulfonate (MS-222), fixed in 10% buffered formalin, and later transferred

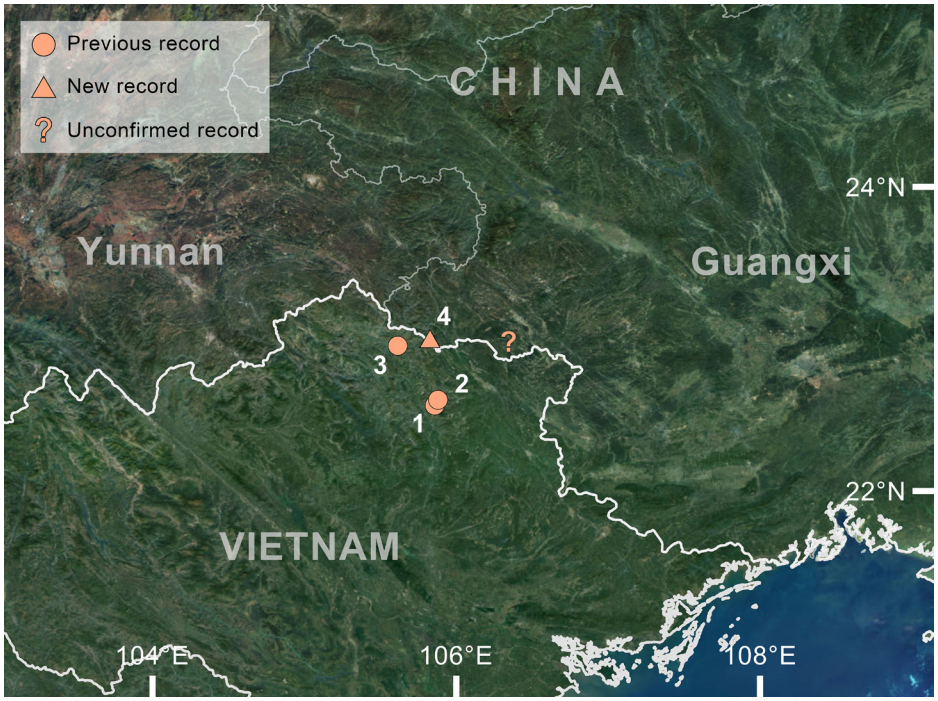


**Figure 1.** Map showing the geographic distribution of *Tylototriton koliaensis*. 1 = Kolia Organic Farm, Phia Oac-Phia Den National Park, Thanh Cong Commune, Nguyen Binh District, Cao Bang Province, Vietnam. 2 = Kolia Mountain Pass, Phia Oac-Phia Den National Park, Thanh Cong Commune, Nguyen Binh District, Cao Bang Province, Vietnam. 3 = Ngan Son Mountain Range, Bao Lac District, Cao Bang Province, Vietnam. 4 = Bainan Township, Napo County, Guangxi Zhuang Autonomous Region, China. ? = an unconfirmed record in Jingxi City, Guangxi Zhuang Autonomous Region, China.

to 75% ethanol for permanent preservation at Sun Yat-sen University (SYS), Guangzhou, Guangdong, China. Liver tissue was excised from each specimen prior to fixation and preserved in 95% ethanol for use in subsequent molecular experiments.

**Laboratory procedures.** Genomic DNA was extracted from tissue samples using a DNA extraction kit (Tiangen Biotech Co., Ltd., Beijing), following the manufacturer's protocol. Two mitochondrial DNA fragments, the partial 16S ribosomal RNA coding sequence (16S rRNA) and the partial NADH dehydrogenase subunit 2 gene (*ND2*), were amplified by PCR using the primers and conditions provided by Poyarkov et al. (2024). PCR products were purified using spin column and sequenced with the same primers and the BigDye Terminator Cycle Sequencing Kit (Applied Biosystems, Waltham, MA, USA). Sequencing was performed on an ABI Prism 3730 automated DNA sequencer by Wuhan Tianyi Huiyuan Bioscience and Technology Inc. All newly obtained nucleotide sequences have been deposited in GenBank (https://www.ncbi.nlm.nih.gov/genbank; Table 1).

**Molecular phylogeny.** Nucleotide sequences from 34 samples, including 32 *Tylototriton* and two *Echinotriton* Nussbaum & Brodie, 1982 (as outgroup) samples, were newly generated or downloaded from GenBank for molecular phylogenetic analysis (Table 1). After assembly, sequences were aligned in MAFFT v. 7.037b with default algorithm and parameters (Katoh et al. 2005), then edited in order, and concatenated seriatim as the final dataset in MEGA 11 (Tamura et al. 2021). The protein-coding *ND2* sequences were translated into amino acid sequences in MEGA 11 to confirm that only coding regions were included. Pairwise Kimura 2-paramter *p*-distances were calculated in MEGA 11 using the pairwise deletion option (Kimura 1980). The best-fit nucleotide substitution models were selected for fragments and codon positions in IQ-TREE v. 3.1.1 under the Bayesian Information Criterion in ModelFinder (Chernomor et al. 2016; Kalyaanamoorthy et al. 2017; Wong et al. 2026). The selected models were TPM2u+F+I+G4 for 16S rRNA, K3Pu+F+G4 for the first codon position of *ND2*, TIM3+F+I for the second codon position, and TIM2+F+G4 for the third codon position. The matrilineal genealogies were inferred using Bayesian inference (BI) in MrBayes v. 3.2.7a (Ronquist et al. 2012) and maximum likelihood (ML) in IQ-TREE v. 3.1.1. For the BI analysis, two independent Metropolis-coupled Markov chain Monte Carlo analyses were run for 100 million generations, each with one cold chain and three heated chains, with sampling every 1,000 generations and the first 25% of samples discarded as burn-in, resulting in the average standard deviation of split frequencies below 0.005. For the ML analysis, a consensus tree was inferred with 1,000 approximate likelihood ratio test (SH-aLRT) replicates and 1,000 ultrafast bootstrap replicates (Hoang et al. 2018). The Bayesian posterior probability (BPP), SH-aLRT value, and ultrafast bootstrap value (UFB) were employed to evaluate the nodal support. Nodes with BPP $\geq$ 0.90, SH-aLRT $\geq$ 80.0, and UFB $\geq$ 95 are considered strongly supported.

**Table 1.** Molecular samples of *Tylototriton* and *Echinotriton* used in this study. Dashes indicate unavailable data.

| No. | Species | Locality | Voucher specimen | GenBank accession number | |
|---|---|---|---|---|---|
| | | | | 16S | ND2 |
| 1 | *Tylototriton koliaensis* | China: Guangxi: Napo: Bainan Township | SYS a009670 | PZ656449 | PZ662445 |
| 2 | *T. koliaensis* | China: Guangxi: Napo: Bainan Township | SYS a009671 | PZ656450 | PZ662446 |
| 3 | *T. koliaensis* | China: Guangxi: Napo: Bainan Township | SYS a009672 | PZ656451 | PZ662447 |
| 4 | *T. koliaensis* | China: Guangxi: Napo: Bainan Township | SYS a009713 | PZ656452 | PZ662448 |
| 5 | *T. koliaensis* | Vietnam: Cao Bang: Nguyen Binh: Thanh Cong | ZMMU A-8157 | PQ530962 | PQ530359 |
| 6 | *T. koliaensis* | Vietnam: Cao Bang: Nguyen Binh: Thanh Cong | ZMMU A-8158 | PQ530963 | PQ530360 |
| 7 | *T. koliaensis* | Vietnam: Cao Bang: Nguyen Binh: Thanh Cong | ZMMU A-8159 | PQ530964 | PQ530361 |
| 8 | *T. koliaensis* | Vietnam: Cao Bang: Nguyen Binh: Thanh Cong | ZMMU A-8160 | PQ530965 | PQ530362 |
| 9 | *T. anhuiensis* | China: Anhui: Yuexi County | CIB 08042905-2 | KY800587 | KY800853 |
| 10 | *T. asperrimus* | China: Guangxi: Jinxiu County | CIB GX200807016 | KY800550 | KY800822 |
| 11 | *T. dabienicus* | China: Henan: Shangcheng County | HNNU 1004-015 | KY800607 | KC147811 |
| 12 | *T. guilinensis* | China: Guangxi: Quanzhou: Tianhu Lake | GXNU YU001042 | PZ255437 | PZ247725 |
| 13 | *T. hainanensis* | China: Hainan: Lingshui: Mt. Diaoluo | CIB 20081048 | KY800553 | KC147817 |
| 14 | *T. kweichowensis* | China: Guizhou: Nayong County | GZNU 20180516035 | OM228750 | OM164016 |
| 15 | *T. lizhenchangi* | China: Hunan: Yizhang County | KUHE 42316 | KY800621 | KY800881 |
| 16 | *T. notialis* | Laos: Khammouan: Boualapha District | FMNH 271120 | HM462061 | HM462061 |
| 17 | *T. obsti* | Vietnam: Son La: Van Ho: Xuan Nha Nature Reserve | IEBR 4471 | — | MT210168 |
| 18 | *T. pasmansi* | Vietnam: Hoa Binh: Da Bac: Phu Canh Nature Reserve | IEBR 4466 | — | MT210166 |
| 19 | *T. uyenoi* | Thailand: Chiang Mai: Doi Inthanon | KUHE 19037 | — | AB830730 |
| 20 | *T. shanorum* | Myanmar: Shan State | KUHE 42348 | — | AB769544 |
| 21 | *T. sini* | China: Guangdong: Xinyi: Mt Yunkai | SYS a008354 | — | OK539836 |
| 22 | *T. sini* | China: Guangxi: Baise City | KIZ 08080215 | — | JQ046340 |
| 23 | *T. sparreboomi* | Vietnam: Lai Chau: Sin Ho | IEBR 4476 | — | MT210162 |
| 24 | *T. taliangensis* | China: Sichuan: Shimian County | CIB GG200110183 | KY800559 | KC147819 |
| 25 | *T. thaiorum* | Vietnam: Nghe An: Pu Hoat Nature Reserve | ZMMU A-7577 | MW883482 | MW883478 |
| 26 | *T. verrucosus* | China: Yunnan: Longchuan County | CIB TSHS1 | KY800581 | KY800847 |
| 27 | *T. vietnamensis* | Vietnam: Bac Giang: Tay Yen Tu | IEBR A.3674 | KY800614 | KY800874 |
| 28 | *T. wenxianensis* | China: Gansu: Wen County | CIB 20090527 | KY800579 | KC147813 |
| 29 | *T. yangi* | China: Yunnan: Pingbian County | KUHE 42282 | KY800624 | KY800887 |
| 30 | *T. ziegleri* | Vietnam: Ha Giang: Quan Ba | VNMN 3390 | KY800625 | KY800889 |
| 31 | *T. ziegleri* | Vietnam: Ha Giang: Quan Ba: Bat Dai Son Nature Reserve | ZMMU A-8168 | PQ530961 | PQ530358 |
| 32 | *T. ziegleri* | China: Yunnan: Malipo County | KIZ 2015000082 | KY398015 | KY398015 |
| 33 | *Echinotriton chinhaiensis* | China: Zhejiang: Zhenhai District | CIB ZHJY1 | KY800627 | KY800891 |
| 34 | *E. andersoni* | — | MVZ 232187 | EU880314 | EU880314 |

**Morphology.** Three *Tylototriton* specimens were subjected to morphological measurement and examination. Morphometric data were measured to the nearest 0.1 mm on the left side of fixed specimens using digital callipers (Deli DL91200 Digital Vernier Callipers). Morphometric terminology and measurement methods followed Fei and Ye (2016), with the following morphometric characters used: snout–vent length (SVL), distance between the tip of snout and the anterior margin of vent; head length (HDL), distance between the tip of snout and the articulation of head and trunk; head width (HDW), maximum width of head; snout length (SNT), distance between the tip of snout and the anterior corner of eye; internasal distance (IND), distance between nares; interorbital distance (IOD), minimum distance between both upper eyelids; eye diameter (ED), distance between the anterior and posterior corners of eye; forelimb length (FLL), distance between axilla and the tip of finger III; hindlimb length (HLL), distance between groin and the tip of toe III; axilla–groin distance (AGD), distance between axilla and groin; tail length (TAL), distance between the anterior margin of vent and the tip of tail; and tail height (TAH), maximum vertical height of tail. Morphological examination was performed with the naked eye or under a stereoscopic microscope (Leica EZ4 HD). Sex was determined by dissection and examination of the primary sexual characteristics. Morphological terminology followed Fei and Ye (2016). Comparative morphological data were obtained from the original description (Poyarkov et al. 2024).

# Results

***Tylototriton koliaensis*** **Poyarkov, Nguyen, Le, Le, Arkhipov, Gorin, Hernandez & Dufresnes, 2024**
Cao Bang Crocodile Newt / Cá cóc Cao Bằng / 高平疣螈 (pinyin: gāo píng yóu yuán)
Figures 3–5

**Chresonymy.**

*Tylototriton vietnamensis* Böhme, Schöttler, Nguyen & Köhler, 2005 (in part)—Weisrock et al. 2006; Nguyen et al. 2009 (in part); Shen et al. 2012. Non *Tylototriton vietnamensis* Böhme et al., 2005.

*Tylototriton* cf. *vietnamensis*—Stuart et al. (2010); Gu et al. (2012).

*Tylototriton asperrimus*—Yuan et al. 2011 (in part). Non *Tylototriton asperrimus* Unterstein, 1930.

*Tylototriton ziegleri* Nishikawa, Matsui & Nguyen, 2013 (in part)—Phimmachak et al. 2015 (in part); Hernandez 2016 (in part); Jiang et al. 2017 (in part); Wang et al. 2018 (in part); Zaw et al. 2019 (in part); Lyu et al. 2021 (in part); Liu et al. 2022 (in part); Poyarkov et al. 2021a, 2021b, (in part); Dufresnes and Hernandez 2022 (in part); Nguyen et al. 2022 (in part). Non *Tylototriton ziegleri* Nishikawa et al., 2013.

*Tylototriton koliaensis* Poyarkov, Nguyen, Le, Le, Arkhipov, Gorin, Hernandez & Dufresnes, 2024—Li et al. 2026; Ong et al. 2026; Xiao et al. 2026.

**Holotype.** VIETNAM — Cao Bang • Nguyen Binh District, Thanh Cong Commune, Phia Oac-Phia Den National Park, Kolia Organic Farm; 22.562423°N, 105.862566°E; elev. 1,025 m; 09.VI.2017; Nikolay A. Poyarkov, Son Xuan Le leg.; primary subtropical broadleaf montane forest; 1 ♀ adult, ZMMU A-8157 (field number NAP-07305).

**New records.** CHINA — Guangxi • Napo County, Bainan Township; 23°N, 105°E; elev. 1,200 m; 22.III. 2026; Dan-Yang Zhou, Han-Ming Song leg.; forest; 3 ♀ adult, SYS a009670; SYS a009671; SYS a009672 • Napo County, Bainan Township; 23°N, 105°E; elev. 1,200 m; 28.III.2026; Zhong-Wen Jiang, Cheng Wenda leg.; forest; 1 road-killed specimen, SYS a009713.

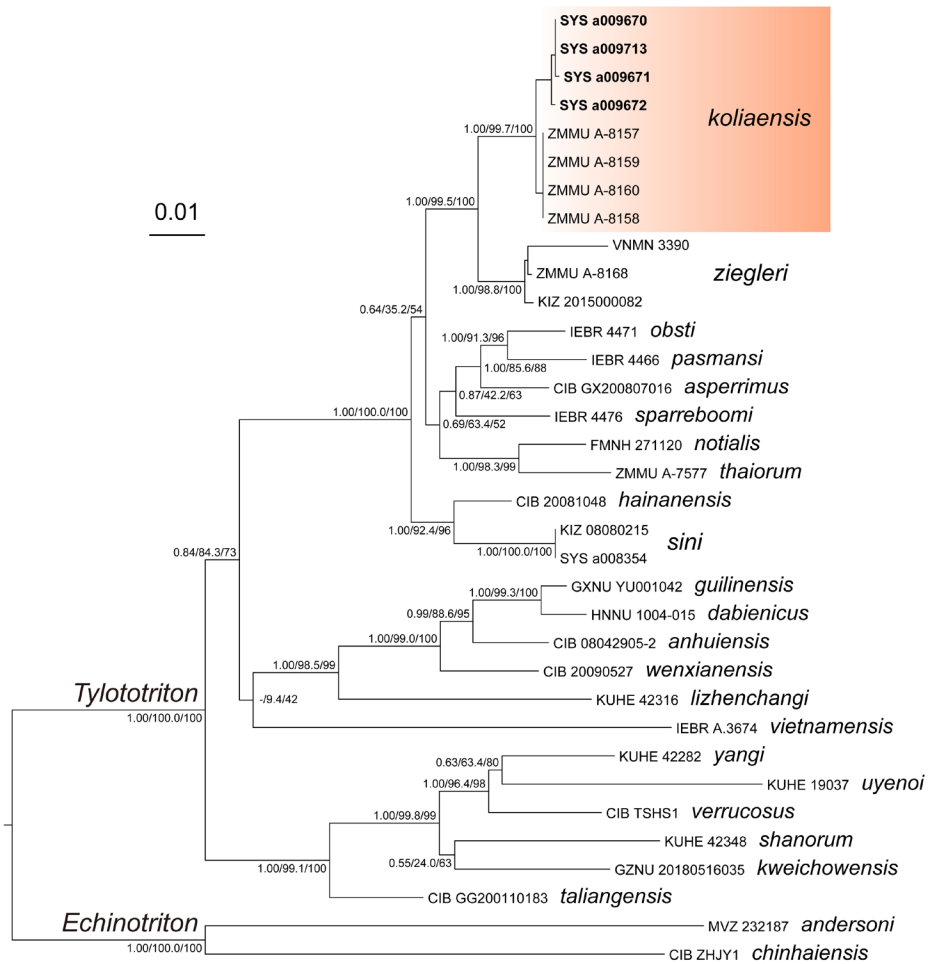


**Figure 2.** Phylogenetic relationships of *Tylototriton* inferred from the maximum likelihood analysis of the concatenated partial 16S ribosomal RNA coding sequence and partial NADH dehydrogenase subunit 2 (*ND2*) gene. Nodal supports are in the order of BPP/SH-aLRT/UFB. The scale bar indicates the number of nucleotide substitutions per site. Vouchers of new records are bold.

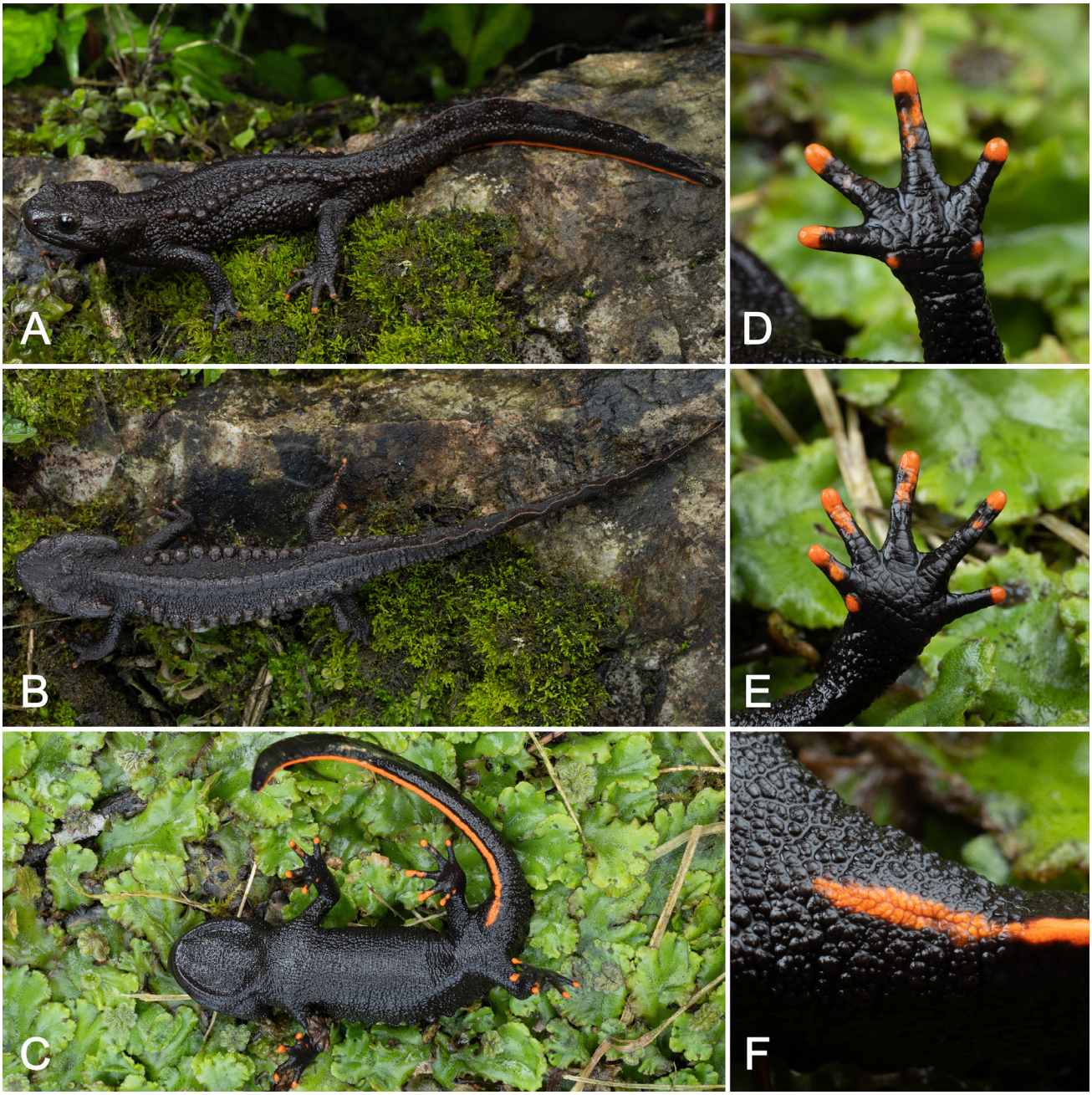


**Figure 3.** *Tylototriton koliaensis* from Napo, Guangxi, China in life. **A.** Dorsolateral view of SYS a009671, adult female. **B.** Dorsal view of same adult female, SYS a009671. **C.** Ventral view of an unvouchered adult female. **D.** Left hand of the same unvouchered adult female. **E.** Left foot of the same unvouchered adult female. **F.** Cloaca of the same unvouchered adult female. Photos by Dan-Yang Zhou.

The road-killed specimen, SYS a009713, was severely damaged and subjected only to molecular analysis.

**Identification.** The final dataset of two mitochondrial DNA fragments included 510 bp of 16S rRNA and 1,035 bp of *ND2*. Both BI and ML analyses recovered nearly identical topologies (Figure 2), which were largely consistent with previous studies (Poyarkov et al. 2024; Xiao et al. 2026) and strongly supported the placement of the four *Tylototriton* specimens from Napo, Guangxi, China with the type series of *T. koliaensis* (BPP = 1.00, SH-aLRT = 99.7, UFB = 100). The Kimura 2-parameter *p*-distances between the Chinese specimens and the type series were 0.45% for 16S rRNA and 0.49%–0.58% for *ND2*, markedly lower than the distances between *T. koliaensis* and its sister species, *T. ziegleri* (0.80%–5.14% for 16S rRNA and 2.46%–2.97% for *ND2*; Appendix Table A1).

Morphologically, all specimens from Napo, Guangxi, China (Figures 3, 4) are similar to one another and conform to diagnosis of *T. koliaensis* provided by Poyarkov et al. (2024): body medium-sized; snout bluntly truncate in dorsal view and rounded in lateral profile; head large; gular fold weak;

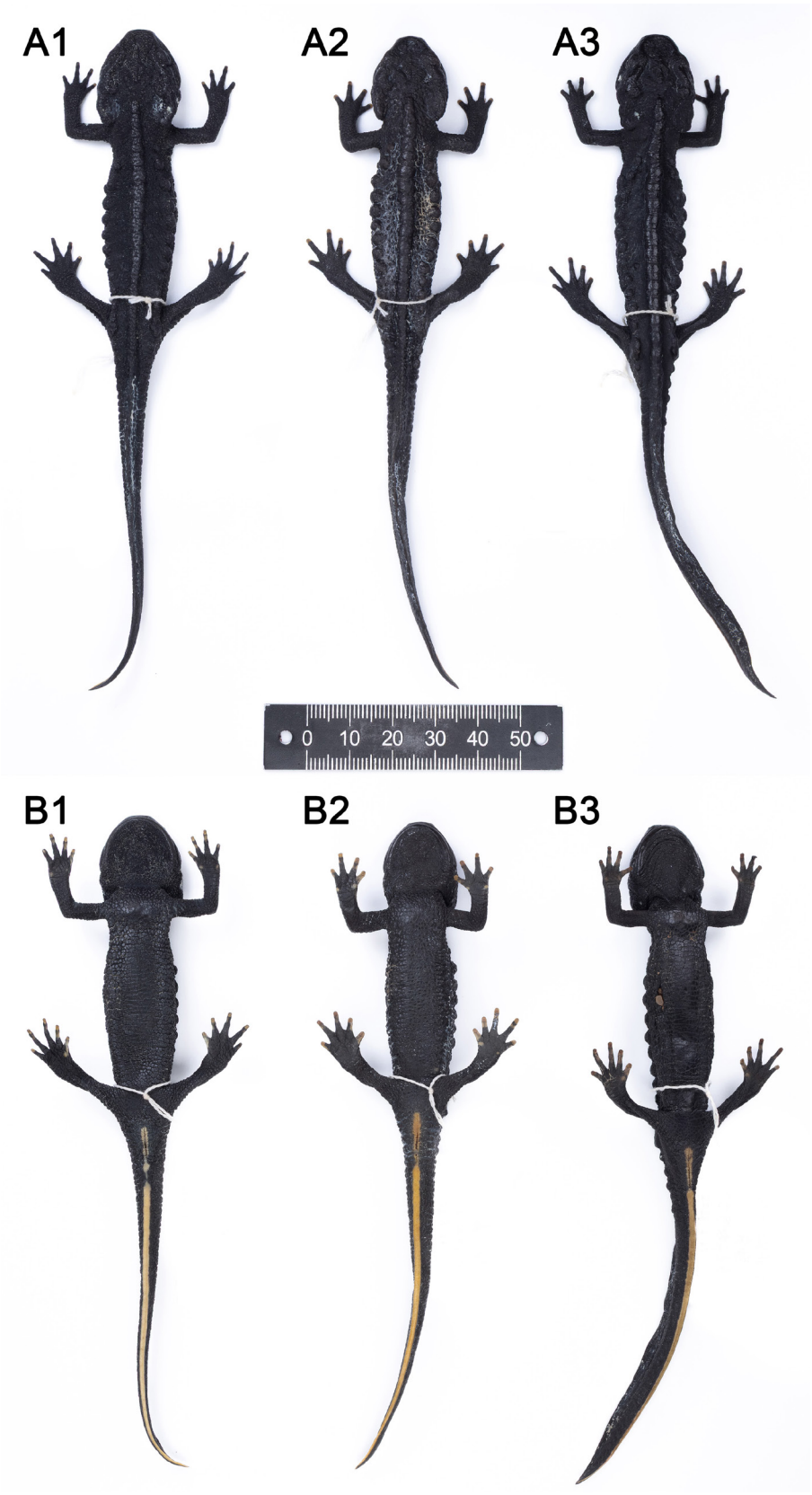


**Figure 4.** *Tylototriton koliaensis* from Napo, Guangxi, China in preservative. **A.** Dorsal view. **B.** Ventral view. **1.** SYS a009670, adult female. **2.** SYS a009671, adult female. **3.** SYS a009672, adult female. Scale bar unit: mm. Photos by Dan-Yang Zhou.

supratemporal bony ridges on head wide, protruding, beginning at the snout; sagittal ridge on head indistinct; vomerine teeth arranged in two gently curving diverging series, converging anteriorly with their anterior corner forming a sharp angle; limbs very long and thin; tips of forelimbs and hindlimbs greatly overlapping when adpressed along body; vertebral ridge prominent, glandular and slightly segmented; rib nodules 10–12, small, knoblike, rounded, protruding, arranged in two irregular

dorsolateral series, intermittent with smaller warts; granules on dorsal skin present; skin rough with fine granules laterally, granules getting smaller at mid-dorsum; tail base widened; dorsal background colouration black, ventral colouration black; limbs black; finger and toe tips, parts of palm and sole bright orange; orange stripe continuing along the ventral edge of tail to the tail tip; bright orange markings on the parotoids or rib nodules absent. No distinct morphological or morphometric differences were detected among the new specimens or between the new specimens and the type series (Table 2, Figure 4). Combining the evidence of molecular phylogenetics and morphology, our results supported the taxonomic identification of the specimens from Napo, Guangxi, China as *T. koliaensis*.

**Distribution.** *Tylototriton koliaensis* is currently known from Nguyen Binh District and Bao Lac District, Cao Bang Province, Vietnam, and Napo County, Guangxi Zhuang Autonomous Region, China. This species may also occur in Jingxi City, Guangxi, China (Figure 1; Hernandez 2016; Liu et al. 2022; Poyarkov et al. 2024; see Discussion below).

**Ecology.** This species inhabits subtropical montane broadleaf forests on limestone substrates at an elevation of approximately 1,200 m a.s.l. in Napo, Guangxi, China. During our fieldwork in March, all live individuals were found in or immediately adjacent to the shallow (<0.5 m) natural pond during nighttime after heavily rainy weather. Many eggs were observed beneath the leaf litter near the pond, but no larvae or copulation behaviour were found (Figure 5).

**Remarks.** The range of SVL of the type specimens is 56.0–61.4 mm in males and 70.8–73.0 mm in females (Poyarkov et al. 2024). In the three female specimens examined in this study the SVL range is 70.9–78.0 mm (Table 2), expanding the SVL size range to 70.8–78.0 mm in females. As no male specimens reported here, the range in the males remains unchanged.

# Discussion

Hernandez (2016) reported a *Tylototriton* record in Jingxi City, Guangxi ZAR, China as *T. ziegleri*; however, this identification was not molecularly verified. Subsequently, Poyarkov et al. (2024) noted that the Jingxi record lies far from the known distribution range of *T. ziegleri* but close to that of *T. koliaensis*. Based on this geographic evidence, but in the absence of sufficient data to confirm its specific identity, they tentatively referred the Jingxi record to *T.* cf. *koliaensis* (Figure 1). As a result, the occurrence of *T. koliaensis* in China remained uncertain. In the present study, we provide the first genetically and morphologically confirmed record of *T. koliaensis* from China, based on specimens from Napo County, Guangxi ZAR. This record is geographically close to, but distinct from, the Jingxi record reported by Hernandez (2016). Our record therefore represents the first formal record of *T. koliaensis* in China. However, further surveys and integrative taxonomic evidence are still needed to clarify the taxonomic identity of the *Tylototriton* record in Jingxi, Guangxi, China.

A recent study (Xiao et al. 2026) revealed that at least three *Tylototriton* species occur in Guangxi, China, including *T. sini* Lyu, Wang, Zeng, Zhou, Qi, Wan & Wang, 2021 in Baise, a city near the China–Vietnam border (Figure 2, Table 1). The new record of *T. koliaensis* in this study represents the fourth recognized *Tylototriton* species in Guangxi and is geographically close to the *T. sini* record of Xiao et al. (2026) (compare Figure 1 with Xiao et al. 2026: figure 1). This pattern implies that the heterogeneous and complex topography of the China–Vietnam border region may have promoted the local

**Table 2.** Morphometric data (in mm) of *Tylototriton koliaensis* specimens examined in this study, and the comparison with the holotype. See Methods for abbreviations.

| Voucher specimen | SYS a009670 | SYS a009671 | SYS a009672 | Holotype |
|---|---|---|---|---|
| Sex | ♀ | ♀ | ♀ | ♀ |
| SVL | 75.6 | 70.9 | 78.0 | 73.0 |
| HDL | 24.9 | 22.4 | 24.7 | 14.5 |
| HDW | 19.6 | 18.7 | 19.2 | 17.8 |
| SNT | 6.7 | 6.3 | 7.4 | 6.6 |
| IND | 6.7 | 6.6 | 6.9 | 6.0 |
| IOD | 8.5 | 7.6 | 8.6 | 8.3 |
| ED | 5.5 | 5.3 | 5.2 | 3.0 |
| FLL | 26.9 | 25.4 | 25.2 | 22.8 |
| HLL | 26.7 | 25.5 | 26.9 | 24.6 |
| AGD | 40.4 | 36.3 | 44.0 | 39.3 |
| TAL | 84.8 | 87.8 | 87.0 | 71.1 |
| TAH | 8.7 | 10.1 | 9.7 | 9.5 |

**Figure 5.** *Tylototriton koliaensis* from Napo, Guangxi, China in life. **A.** Habitat. **B.** Unvouchered individuals in situ. **C.** Eggs. Photos by Dan-Yang Zhou.

diversification of this genus, and the *Tylototriton* diversity in Guangxi likely remains underestimated. Further field surveys and integrative taxonomic studies are therefore warranted to clarify the true species diversity and distribution pattern of this genus in Guangxi.

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## Additional information

**Conflict of interest**

The authors declare that no competing interests exist.

**Ethical statement**

No ethical statement is reported.

**Use of artificial intelligence (AI)**

The authors accept full responsibility for the content of the manuscript, including the disclosure of

any use of AI. The AI tool ChatGPT-5.6 Thinking were used in the preparation of this manuscript under supervision and final proofreading by human, for the language editing prior to submission.

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**Author contributions**

Conceptualization: HMS, DYZ, SQ. Data curation: HMS, YYW. Formal analysis: HMS, DYZ. Funding acquisition: SQ, YYW. Investigation: HMS, DYZ. Supervision: YYW. Visualization: HMS, DYZ. Writing – original draft: HMS. Writing – review and editing: HMS, DYZ, SQ, YYW.

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**Data availability**

All data that support the findings of this study are available in the main text, Appendix, and GenBank depository.

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# Appendix

**Table A1.** Kimura 2-parameter *p*-distances (%) within *Tylototriton*. Numbers correspond to those in Table 1. Values in the upper right part were inferred from the partial 16S ribosomal RNA coding sequence, and those in the lower left part were inferred from partial NADH dehydrogenase subunit 2 (*ND2*) gene. Hyphens indicate unavailable data.

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 0.00 | 0.00 | 0.00 | 0.45 | 0.45 | 0.45 | 0.45 | 3.93 | 1.80 | 4.39 | 4.00 | 1.58 | 5.09 | 3.66 | 0.00 | — | — | — | — | — | — | — | 6.08 | 2.03 | 5.36 | 5.36 | 3.66 | 3.68 | 5.13 | 1.12 | 0.90 |
| 2 | 0.10 | | 0.00 | 0.00 | 0.45 | 0.45 | 0.45 | 0.45 | 3.93 | 1.81 | 4.40 | 4.01 | 1.58 | 5.11 | 3.67 | 0.00 | — | — | — | — | — | — | — | 6.09 | 2.04 | 5.37 | 5.37 | 3.67 | 3.69 | 5.14 | 1.12 | 0.90 |
| 3 | 0.19 | 0.29 | | 0.00 | 0.45 | 0.45 | 0.45 | 0.45 | 3.93 | 1.80 | 4.39 | 4.00 | 1.58 | 5.09 | 3.66 | 0.00 | — | — | — | — | — | — | — | 6.08 | 2.03 | 5.36 | 5.36 | 3.66 | 3.68 | 5.13 | 1.12 | 0.90 |
| 4 | 0.00 | 0.10 | 0.19 | | 0.45 | 0.45 | 0.45 | 0.45 | 3.93 | 1.81 | 4.40 | 4.01 | 1.58 | 5.11 | 3.67 | 0.00 | — | — | — | — | — | — | — | 6.09 | 2.04 | 5.37 | 5.37 | 3.67 | 3.69 | 5.14 | 1.12 | 0.90 |
| 5 | 0.49 | 0.58 | 0.49 | 0.49 | | 0.00 | 0.00 | 0.00 | 3.48 | 1.60 | 3.89 | 3.54 | 1.00 | 4.09 | 3.25 | 0.00 | — | — | — | — | — | — | — | 4.95 | 2.03 | 4.53 | 4.75 | 3.25 | 2.85 | 4.11 | 1.12 | 0.80 |
| 6 | 0.49 | 0.58 | 0.49 | 0.49 | 0.00 | | 0.00 | 0.00 | 3.48 | 1.60 | 3.89 | 3.54 | 1.00 | 4.09 | 3.25 | 0.00 | — | — | — | — | — | — | — | 4.95 | 2.03 | 4.53 | 4.75 | 3.25 | 2.85 | 4.11 | 1.12 | 0.80 |
| 7 | 0.49 | 0.58 | 0.49 | 0.49 | 0.00 | 0.00 | | 0.00 | 3.48 | 1.60 | 3.89 | 3.54 | 1.00 | 4.09 | 3.25 | 0.00 | — | — | — | — | — | — | — | 4.95 | 2.03 | 4.53 | 4.75 | 3.25 | 2.85 | 4.11 | 1.12 | 0.80 |
| 8 | 0.49 | 0.58 | 0.49 | 0.49 | 0.00 | 0.00 | 0.00 | | 3.48 | 1.60 | 3.89 | 3.54 | 1.00 | 4.09 | 3.25 | 0.00 | — | — | — | — | — | — | — | 4.95 | 2.03 | 4.53 | 4.75 | 3.25 | 2.85 | 4.11 | 1.12 | 0.80 |
| 9 | 9.35 | 9.46 | 9.35 | 9.35 | 9.13 | 9.13 | 9.13 | 9.13 | | 4.13 | 1.21 | 1.02 | 3.69 | 3.89 | 2.03 | 2.63 | — | — | — | — | — | — | — | 4.98 | 4.16 | 4.35 | 4.57 | 1.00 | 2.87 | 3.92 | 4.16 | 3.48 |
| 10 | 4.51 | 4.61 | 4.51 | 4.51 | 4.30 | 4.30 | 4.30 | 4.30 | 8.26 | | 4.54 | 3.98 | 1.40 | 4.94 | 3.25 | 0.00 | — | — | — | — | — | — | — | 5.17 | 2.48 | 4.54 | 4.32 | 3.46 | 3.91 | 4.97 | 1.57 | 1.20 |
| 11 | 10.39 | 10.51 | 10.39 | 10.39 | 10.17 | 10.17 | 10.17 | 10.17 | 3.80 | 9.29 | | 0.61 | 4.10 | 4.74 | 2.43 | 2.63 | — | — | — | — | — | — | — | 5.40 | 4.87 | 4.56 | 4.55 | 1.41 | 3.07 | 4.56 | 4.14 | 3.47 |
| 12 | 9.93 | 10.05 | 9.93 | 9.93 | 9.71 | 9.71 | 9.71 | 9.71 | 3.49 | 8.61 | 1.47 | | 3.75 | 4.39 | 1.85 | 3.45 | — | — | — | — | — | — | — | 5.29 | 4.73 | 4.64 | 4.42 | 1.23 | 3.13 | 4.42 | 3.75 | 3.11 |
| 13 | 4.62 | 4.72 | 4.41 | 4.62 | 4.41 | 4.41 | 4.41 | 4.41 | 8.36 | 4.63 | 9.50 | 9.05 | | 3.67 | 3.04 | 0.00 | — | — | — | — | — | — | — | 4.31 | 1.80 | 3.89 | 4.53 | 3.04 | 3.06 | 3.69 | 0.89 | 0.60 |
| 14 | 10.33 | 10.45 | 10.33 | 10.33 | 10.11 | 10.11 | 10.11 | 10.11 | 10.38 | 10.93 | 11.08 | 10.61 | 9.10 | | 4.30 | 0.00 | — | — | — | — | — | — | — | 3.04 | 5.33 | 2.64 | 4.30 | 3.87 | 2.23 | 0.00 | 4.84 | 4.09 |
| 15 | 10.73 | 10.62 | 10.50 | 10.73 | 10.74 | 10.74 | 10.74 | 10.74 | 8.76 | 11.48 | 9.45 | 8.88 | 9.37 | 11.63 | | 0.00 | — | — | — | — | — | — | — | 4.09 | 3.89 | 3.89 | 4.54 | 1.40 | 3.27 | 4.32 | 3.42 | 2.83 |
| 16 | 5.34 | 5.45 | 5.34 | 5.34 | 5.14 | 5.14 | 5.14 | 5.14 | 8.93 | 4.63 | 9.96 | 9.17 | 5.04 | 10.58 | 10.87 | | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 2.63 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17 | 4.92 | 5.02 | 4.92 | 4.92 | 4.71 | 4.71 | 4.71 | 4.71 | 8.58 | 3.18 | 9.61 | 9.39 | 4.83 | 10.47 | 11.12 | 4.62 | | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 18 | 5.45 | 5.56 | 5.45 | 5.45 | 5.03 | 5.03 | 5.03 | 5.03 | 8.93 | 3.48 | 10.20 | 9.74 | 5.57 | 11.15 | 11.48 | 5.14 | 2.87 | | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 19 | 15.15 | 15.28 | 15.15 | 15.15 | 14.91 | 14.91 | 14.91 | 14.91 | 14.00 | 15.08 | 14.63 | 14.12 | 13.59 | 8.38 | 14.60 | 14.33 | 14.48 | 14.95 | | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 20 | 12.39 | 12.51 | 12.39 | 12.39 | 12.16 | 12.16 | 12.16 | 12.16 | 11.63 | 11.95 | 11.99 | 11.63 | 10.55 | 6.10 | 13.03 | 11.60 | 11.60 | 12.89 | 9.59 | | — | — | — | — | — | — | — | — | — | — | — | — |
| 21 | 5.14 | 5.24 | 4.93 | 5.14 | 4.93 | 4.93 | 4.93 | 4.93 | 8.59 | 5.69 | 9.73 | 9.28 | 3.29 | 9.43 | 9.71 | 5.79 | 5.57 | 5.89 | 13.35 | 10.32 | | — | — | — | — | — | — | — | — | — | — | — |
| 22 | 4.07 | 4.29 | 4.07 | 4.07 | 3.63 | 3.63 | 3.63 | 3.63 | 7.74 | 5.23 | 9.45 | 8.49 | 3.43 | 8.40 | 7.74 | 4.31 | 3.86 | 5.00 | 12.31 | 9.09 | 0.00 | | — | — | — | — | — | — | — | — | — | — |
| 23 | 4.61 | 4.72 | 4.61 | 4.61 | 4.41 | 4.41 | 4.41 | 4.41 | 8.28 | 3.90 | 9.17 | 8.95 | 4.63 | 10.26 | 10.66 | 4.94 | 3.89 | 4.41 | 15.12 | 11.51 | 5.05 | 4.07 | | — | — | — | — | — | — | — | — | — |
| 24 | 11.03 | 11.03 | 11.03 | 11.03 | 10.81 | 10.81 | 10.81 | 10.81 | 9.50 | 10.15 | 9.86 | 9.39 | 9.22 | 6.73 | 10.28 | 10.25 | 10.27 | 10.95 | 10.85 | 8.70 | 9.45 | 7.98 | 10.05 | | 5.82 | 2.43 | 5.18 | 4.31 | 2.85 | 3.05 | 5.10 | 4.52 |
| 25 | 5.56 | 5.66 | 5.56 | 5.56 | 5.35 | 5.35 | 5.35 | 5.35 | 8.60 | 4.94 | 9.40 | 8.84 | 4.83 | 10.70 | 10.42 | 2.86 | 4.82 | 5.14 | 13.86 | 11.95 | 6.21 | 5.45 | 4.83 | 9.79 | | 5.09 | 5.59 | 3.89 | 3.90 | 5.35 | 1.80 | 1.57 |
| 26 | 12.75 | 12.88 | 12.75 | 12.75 | 12.52 | 12.52 | 12.52 | 12.52 | 11.41 | 12.44 | 11.90 | 11.30 | 11.13 | 6.11 | 12.69 | 12.08 | 12.20 | 13.38 | 7.40 | 6.52 | 10.90 | 8.15 | 12.59 | 7.92 | 12.09 | | 4.54 | 3.68 | 2.02 | 2.64 | 4.62 | 3.89 |
| 27 | 12.68 | 12.56 | 12.68 | 12.68 | 12.44 | 12.44 | 12.44 | 12.44 | 11.56 | 11.52 | 11.80 | 11.34 | 11.64 | 13.03 | 13.00 | 12.58 | 11.65 | 12.82 | 16.65 | 13.59 | 12.02 | 10.65 | 11.54 | 12.25 | 12.93 | 13.36 | | 4.32 | 3.91 | 4.11 | 4.61 | 3.89 |
| 28 | 10.48 | 10.60 | 10.48 | 10.48 | 10.26 | 10.26 | 10.26 | 10.26 | 4.21 | 9.27 | 5.06 | 4.52 | 9.48 | 10.59 | 8.63 | 9.71 | 9.93 | 10.52 | 13.98 | 12.32 | 9.94 | 8.69 | 9.96 | 9.36 | 9.38 | 10.59 | 11.54 | | 2.64 | 3.89 | 3.42 | 2.83 |
| 29 | 11.23 | 11.34 | 11.23 | 11.23 | 11.00 | 11.00 | 11.00 | 11.00 | 10.83 | 11.14 | 11.91 | 11.07 | 10.33 | 6.44 | 12.10 | 11.14 | 10.68 | 11.83 | 7.75 | 6.74 | 9.42 | 7.22 | 10.82 | 8.39 | 11.27 | 4.11 | 13.49 | 10.59 | | 2.23 | 3.91 | 3.26 |
| 30 | 2.76 | 2.86 | 2.76 | 2.76 | 2.46 | 2.46 | 2.46 | 2.46 | 8.45 | 4.20 | 9.48 | 8.91 | 4.51 | 9.76 | 10.96 | 5.14 | 4.82 | 5.34 | 14.66 | 11.92 | 5.46 | 4.97 | 4.51 | 10.23 | 5.02 | 12.28 | 12.20 | 9.57 | 10.88 | | 4.87 | 4.11 |
| 31 | 2.76 | 2.86 | 2.76 | 2.76 | 2.46 | 2.46 | 2.46 | 2.46 | 8.45 | 4.20 | 9.48 | 8.91 | 4.51 | 9.76 | 10.96 | 5.14 | 4.82 | 5.34 | 14.66 | 11.92 | 5.46 | 4.97 | 4.51 | 10.23 | 5.02 | 12.28 | 12.20 | 9.57 | 10.88 | 0.00 | | 0.22 |
| 32 | 2.86 | 2.97 | 2.86 | 2.86 | 2.56 | 2.56 | 2.56 | 2.56 | 8.34 | 4.09 | 9.36 | 8.80 | 4.41 | 9.88 | 10.84 | 5.03 | 4.92 | 5.45 | 14.54 | 11.80 | 5.57 | 4.97 | 4.61 | 10.11 | 4.92 | 12.17 | 12.09 | 9.46 | 11.00 | 0.29 | 0.29 | |