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A new species of *Cyrtodactylus* (Squamata: Gekkonidae) from Khammouane Province, Laos

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Abstract

We describe a new species of the genus *Cyrtodactylus* based on two adult specimens from Khammouane Province, Laos. *Cyrtodactylus jaegeri* **sp. nov.** is distinguished from the remaining Indochinese bent-toed geckos by a combination of the following characters: a moderately sized *Cyrtodactylus* with a maximum SVL reaching 68.5 mm; dorsal pattern consisting of a dark nuchal loop and four narrow brown body bands between limb insertions; dorsal tubercles in 15–17 irregular rows; ventrals in 31–32 longitudinal rows at midbody; lateral skin folds present with interspersed tubercles; precloacal–femoral pores 44 in the male, in a continuous series; enlarged femoral scales and precloacal scales present; postcloacal tubercles 3–6; subcaudals transversely enlarged. *Cyrtodactylus jaegeri* **sp. nov.** is the ninth species of *Cyrtodactylus* known from Laos.

Key words: *Cyrtodactylus jaegeri* **sp. nov.**, Indochina, karst forest, morphology, taxonomy

Introduction

Cyrtodactylus is known as the most diverse genus of gekkonids to date with a total of 172 currently recognized species (e.g., Uetz *et al.* 2013; Nguyen *et al.* 2013; Ziegler *et al.* 2013). This genus has a widespread distribution throughout tropical South Asia, Indochina, the Philippines, the Indo–Australian Archipelago, and the Solomon Islands in the East (Bauer & Henle 1994). In Laos, eight species of *Cyrtodactylus* have been recorded so far and five of them have been described during last three years: *C. buchardi* David, Teynié & Ohler, 2004 from Champasak Province, *C. interdigitalis* Ulber, 1993 from Vientiane Province, *C. jarujini* Ulber, 1993 from Borikhamxay Province, *C. lomyenensis* Ngo & Pauwels, 2010 from Khammouane Province, *C. wayakonei* Nguyen, Kingsada, Rösler, Auer & Ziegler, 2010 from Luang Nam Tha Province, *C. roesleri* Ziegler, Nazarov, Orlov, Nguyen, Vu, Dang, Dinh & Schmitz, 2010 from Khammouane Province (Teynié & David 2010), *C. teyniei* David, Nguyen, Schneider & Ziegler, 2011 from Borikhamxay Province, and *C. pageli* Schneider, Nguyen, Schmitz, Kingsada, Auer & Ziegler, 2011 from Vientiane Province. Our recent field research in Laos led to the discovery of another new population of *Cyrtodactylus*. Based on morphological examination of two adult specimens, we herein describe a new species from Khammouane, Laos.

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References

- Bauer, A.M. & Henle, K. (1994) *Familia Gekkonidae (Reptilia, Sauria). Part 1. Australia and Oceania*. Das Tierreich 109, 309 pp.
- Bauer, A.M., Kunya, K., Sumontha, M., Niyomwan, P., Panitvong, N., Pauwels, O.S.G., Chanhom, L. & Kunya, T. (2009) *Cyrtodactylus erythropros* (Squamata: Gekkonidae), a new cave-dwelling gecko from Mae Hong Son Province, Thailand. *Zootaxa*, 2124, 51–62.
- Bauer, A., Kunya, K., Sumontha, M., Niyomwan, P., Pauwels, O.S.G., Chanhom, L. & Kunya, T. (2010) *Cyrtodactylus dummuui* (Squamata: Gekkonidae), a new cave-dwelling gecko from Chiang Mai Province, Thailand. *Zootaxa*, 2570, 41–50.
- Bauer, A.M., Pauwels, O.S.G. & Chanhom, L. (2002) A New Species of Cave-dwelling *Cyrtodactylus* (Squamata: Gekkonidae) from Thailand. *Natural History Journal of Chulalongkorn University*, 2 (2), 19–29.
- Bauer, A.M., Sumontha, M. & Pauwels, O.S.G. (2003) Two new species of *Cyrtodactylus* (Reptilia: Squamata: Gekkonidae) from Thailand. *Zootaxa*, 376, 1–18.
- Darevsky, I.S. & Szczerbak, N.N. (1997) A new gecko of the genus *Gonydactylus* (Sauria: Gekkonidae) with a key to the species from Vietnam. *Asiatic Herpetological Research*, 7, 19–22.
- David, P., Nguyen, T.Q., Schneider, N. & Ziegler, T. (2011) A new species of the genus *Cyrtodactylus* Gray, 1827 from central Laos (Squamata: Gekkonidae). *Zootaxa*, 2833, 29–40.
- David, P., Teynié, A. & Ohler, A. (2004) A new species of *Cyrtodactylus* Gray, 1827 (Reptilia: Squamata: Gekkonidae) from southern Laos. *The Raffles Bulletin of Zoology*, 52, 621–627.
- Geissler, P., Nazarov, R.A., Orlov, N.L., Böhme, W., Phung, T.M., Nguyen, T.Q. & Ziegler, T. (2009) A new species of the *Cyrtodactylus irregularis* complex (Squamata: Gekkonidae) from southern Vietnam. *Zootaxa*, 2161, 20–32.
- Grismer, L.L., Wood, P.L. Jr, Quah, E.S.H., Anuar, S., Muin, A., Sumontha, M., Ahmad, N., Bauer, A.M., Wangkulangkul, S., Grismer, J.L. & Pauwels, O.S.G. (2012) A phylogeny and taxonomy of the Thai–Malay Peninsula Bent-toed Geckos of the *Cyrtodactylus pulchellus* complex (Squamata: Gekkonidae): combined morphological and molecular analyses with descriptions of seven new species. *Zootaxa*, 3520, 1–55.
- Heidrich, A., Rösler, H., Vu, T.N., Böhme, W. & Ziegler, T. (2007) Another new *Cyrtodactylus* (Squamata: Gekkonidae) from Phong Nha – Ke Bang National Park, central Truong Son, Vietnam. *Zootaxa*, 1445, 35–48.
- Hoang, Q.X., Orlov, N.L., Ananjeva, N.B., Johns, A.G., Hoang, T.N. & Dau, V.Q. (2007) Description of a new species of the genus *Cyrtodactylus* Gray, 1827 (Squamata: Sauria: Gekkonidae) from the karst of North Central Vietnam. *Russian Journal of Herpetology*, 14, 98–106.
- Honda, M., Ota, H., Murphy, R.W. & Hikida, T. (2006) Phylogeny and biogeography of water skinks of the genus *Tropidophorus* (Reptilia: Scincidae): a molecular approach. *Zoologica Scripta*, 35, 85–95.
<http://dx.doi.org/10.1111/j.1463-6409.2005.00215.x>
- Luu, V.Q., Nguyen, T.Q., Calame, T., Hoang, T.T., Southickack, S., Bonkowski, M. & Ziegler, T. (2013) New country records of reptiles from Laos. *Biodiversity Data Journal*, 1, 1–14.
<http://dx.doi.org/10.3897/BDJ.1.e1015>
- Luu, V.Q., Nguyen, T.Q., Do, H.Q. & Ziegler, T. (2011) A new *Cyrtodactylus* (Squamata: Gekkonidae) from Huong Son limestone forest, Hanoi, northern Vietnam. *Zootaxa*, 3129, 39–50.
- Nazarov, R.A., Orlov, N.L., Nguyen, S.N. & Ho, C.T. (2008) Taxonomy of naked-toe geckos *Cyrtodactylus irregularis* complex of South Vietnam and description of a new species from Chu Yang Sin Natural Park (Krong Bong District, Dac Lac Province), Vietnam. *Russian Journal of Herpetology*, 15, 141–156.
- Nazarov, R., Poyarkov, N.A., Orlov, N.I., Phung, T.M., Nguyen, T.T., Hoang, D.M. & Ziegler, T. (2012) Two new cryptic species of the *Cyrtodactylus irregularis* complex (Squamata: Gekkonidae) from southern Vietnam. *Zootaxa*, 3302, 1–24.
- Ngo, T.V. (2008) Two new cave-dwelling species of *Cyrtodactylus* Gray (Squamata: Gekkonidae) from Southwestern Vietnam. *Zootaxa*, 1909, 37–51.
- Ngo, T.V. (2011) *Cyrtodactylus martini*, another new karst-dwelling *Cyrtodactylus* Gray, 1827 (Squamata: Gekkonidae) from northwestern Vietnam. *Zootaxa*, 2834, 33–46.
- Ngo, T.V. & Bauer, A.M. (2008) Descriptions of two new species of *Cyrtodactylus* Gray, 1827 (Squamata: Gekkonidae) endemic to southern Vietnam. *Zootaxa*, 715, 27–42.
- Ngo, T.V. & Chan, K.O. (2010) A new species of *Cyrtodactylus* Gray, 1826 (Squamata: Gekkonidae) from Khanh Hoa province, southern Vietnam. *Zootaxa*, 2504, 47–60.
- Ngo, T.V. & Chan, K.O. (2011) A new karstic cave-dwelling *Cyrtodactylus* Gray (Squamata: Gekkonidae) from northern Vietnam. *Zootaxa*, 3125, 51–63.
- Ngo, T.V. & Grismer, L.L. (2010) A new karst dwelling *Cyrtodactylus* (Squamata: Gekkonidae) from Son La Province, north-western Vietnam. *Hamadryad*, 35, 84–95.
- Ngo, T.V. & Pauwels, O.S.G. (2010) A new cave-dwelling species of *Cyrtodactylus* Gray, 1827 (Squamata: Gekkonidae) from Khammouane Province, southern Laos. *Zootaxa*, 2730, 44–56.
- Nguyen, S.N., Le, N.T.T., Tran, D.T.A., Orlov, N.L., Lathrop, A., Macculloch, R.D., Le, D.T.T., Jin, J-Q., Nguyen, L.T.,

- Nguyen, T.T., Hoang, D.D., Che, J., Murphy, R.W. & Zhang, Y-P. (2013) Phylogeny of the *Cyrtodactylus irregularis* species complex (Squamata: Gekkonidae) from Vietnam with the description of two new species. *Zootaxa*, 3737, 399–414. <http://dx.doi.org/10.11646/zootaxa.3737.4.4>
- Nguyen, S.N., Orlov, N.L. & Darevsky, I.S. (2006) Descriptions of two new species of the genus *Cyrtodactylus* Gray, 1827 (Squamata: Sauria: Gekkonidae) from southern Vietnam. *Russian Journal of Herpetology*, 13, 215–226.
- Nguyen, T.Q., Kingsada, P., Rösler, H., Auer, M. & Ziegler, T. (2010) A new species of *Cyrtodactylus* (Squamata: Gekkonidae) from northern Laos. *Zootaxa*, 2652, 1–16.
- Orlov, N.L., Nguyen, T.Q., Nazarov, R.A., Ananjeva, N.B. & Nguyen, S.N. (2007) A new species of the genus *Cyrtodactylus* Gray, 1827 and redescription of *Cyrtodactylus paradoxus* (Darevsky et Szczerbak, 1997) [Squamata: Sauria: Gekkonidae]. *Russian Journal of Herpetology*, 14, 145–152.
- Pauwels, O.S.G., Bauer, A.M., Sumontha, M. & Chanhome, L. (2004) *Cyrtodactylus thirakhupti* (Squamata: Gekkonidae), a new cave-dwelling gecko from southern Thailand. *Zootaxa*, 772, 1–11.
- Pauwels, O.S.G., Sumontha, M., Latinne, A. & Grismer, L.L. (2013) *Cyrtodactylus sanook* (Squamata: Gekkonidae), a new cave-dwelling gecko from Chumphon Province, southern Thailand. *Zootaxa*, 3635 (3), 275–285. <http://dx.doi.org/10.11646/zootaxa.3635.3.7>
- Rösler, H., Vu, T.N., Nguyen, T.Q., Ngo, T.V. & Ziegler, T. (2008) A new *Cyrtodactylus* (Squamata: Gekkonidae) from central Vietnam. *Hamadryad*, 33, 48–63.
- Schneider, N., Nguyen, T.Q., Schmitz, A., Kingsada, P., Auer, M. & Ziegler, T. (2011) A new species of karst dwelling *Cyrtodactylus* (Squamata: Gekkonidae) from northwestern Laos. *Zootaxa*, 2930, 1–21.
- Smith, M.A. (1917) Descriptions of new reptiles and a new batrachian from Siam. *Journal of Natural History Society of Siam*, 2, 221–225.
- Smith, M.A. (1921) New or little-known Reptiles and Batrachians from Southern Annam (Indochina). *Proceedings of Zoological Society of London*, 1921, 423–440.
- Smith, M.A. (1923) Notes on reptiles and batrachians from Siam and Indo-China (No. 2). *Journal of Natural History Society of Siam*, 6, 47–53.
- Sumontha, M., Panitvong, N. & Deekin, G. (2010) *Cyrtodactylus auribalteatus* (Squamata: Gekkonidae), a new cave-dwelling gecko from Phitsanulok Province, Thailand. *Zootaxa*, 2370, 53–64.
- Taylor, E.H. (1962) New oriental reptiles. *University of Kansas Science Bulletin*, 43, 209–263.
- Taylor, E.H. (1963) Lizards of Thailand. *Scientific Bulletin*, 44, 687–1077.
- Teynié, A. & David, P. (2010) *Voyages Naturalistes au Laos. Les Reptiles*. Editions Revoir, Nohanent (France), 315 pp.
- Theobald, W. (1876) *Descriptive Catalogue of the Reptiles of British India*. Thacker, Spink & Co., Calcutta, xiii + 238 pp.
- Uetz, P. (2013) The Reptile Database. Available from: <http://reptile-database.reptarium.cz> (accessed 10 September 2013)
- Ulber, T. (1993) Bemerkungen über cyrtodactyline Geckos aus Thailand nebst Beschreibungen von zwei neuen Arten (Reptilia: Gekkonidae). *Mitteilungen aus dem Zoologischen Museum in Berlin*, 69, 187–200. <http://dx.doi.org/10.1002/mmzn.19930690202>
- Ziegler, T., Heidrich, A., Schmitz, A. & Böhme, W. (2007) Phylogenetic position, morphology and natural history of the Vietnamese water skink *Tropidophorus noggei* Ziegler, Vu & Bui, 2005 (Sauria: Scincidae). *Revue suisse de Zoologie*, 114, 599–614.
- Ziegler, T., Nazarov, R., Orlov, N., Nguyen, T.Q., Vu, T.N., Dang, K.N., Dinh, T.H. & Schmitz, A. (2010) A third new *Cyrtodactylus* (Squamata: Gekkonidae) from Phong Nha – Ke Bang National Park, Vietnam. *Zootaxa*, 2413, 20–36.
- Ziegler, T., Nguyen, Q.T., Schmitz, A., Stenke, R. & Rösler, H. (2008) A new species of *Goniurosaurus* from Cat Ba Island, Hai Phong, northern Vietnam (Squamata: Eublepharidae). *Zootaxa*, 1771, 16–30.
- Ziegler, T., Phung, T.M., Le, M.D. & Nguyen, T.Q. (2013) A new *Cyrtodactylus* (Squamata: Gekkonidae) from Phu Yen Province, southern Vietnam. *Zootaxa*, 3686, 432–466. <http://dx.doi.org/10.11646/zootaxa.3686.4.2>
- Ziegler, T., Rösler, H., Herrmann, H.-W. & Vu, T.N. (2002) *Cyrtodactylus phongnhakebangensis* sp. n., ein neuer Bogenfingergecko aus dem annamitischen Karstwaldmassiv, Vietnam. *Herpetofauna*, 24, 11–25.

APPENDIX. Comparative material examined.

- Cyrtodactylus huongsonensis*. Vietnam: Hanoi: Huong Son: IEBR A.2011.3 (holotype), ZFMK 92293 (paratype).
- C. pageli*. Laos: Vientiane Province: Vang Vieng: IEBR A.2010.36 (holotype), IEBR A.2010.37, MTD 48025, MHNG 2723.91, NUOL 2010.3–2010.7, ZFMK 91827 (paratypes).
- C. roesleri*. Vietnam: Quang Binh Province: Phong Nha – Ke Bang: ZFMK 89377 (holotype), IEBR A.0932, MHNG 2713.79, VNUH 220509, ZFMK 86433, 89378 (paratypes).
- C. teyniei*. Laos: Borikhamxay Province: near Ban Na Hin: NEM 0095 (holotype); Khammouane Province: Ban Na Than: KM2012.14–2012.15.
- C. wayakonei*. Laos: Luang Nam Tha: Vieng Phoukha: IEBR A.2010.01 (holotype), ZFMK 91016, MTD 47731, NUOL 2010.1 (paratypes).