

## A NEW SPECIES OF *CYRTODACTYLUS* (SAURIA: GEKKONIDAE) FROM PULAU TIOMAN, MALAYSIA

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**ABSTRACT.** - A new species of *Cyrtodactylus* is described from Pulau Tioman, an island off the east coast of Peninsular Malaysia. The new species can be differentiated from congeners from south-east Asia in showing the following combination of characters: medium-sized *Cyrtodactylus* (SVL to 83.2 mm); rostral partially divided by rostral groove, contacted posteriorly by two nostrils and two semi-circular supranasals; pectoral and abdominal scales smooth, rounded, semi-circular, imbricate; no preanal groove, a distinct preanal depression; sharp boundary between small scales on posterior surface of thighs and larger ones on ventral surface of thighs; tail without lateral denticles or tubercles forming whorls or segments; supralabials (to midorbit position) 8-11; infralabials 9-11; midventral scale rows at belly to lowest row of tubercles 36-40; lamellae under toe IV 20-22; preanofemoral pores 19; and dorsal pattern comprises four pale yellow transverse bands, each narrower than the intervening pale brown areas, edges with dark brown, and a pale yellow nuchal loop joining posterior edges of eyes.

**KEY WORDS.** - Systematics, *Cyrtodactylus tiomanensis*, new species, Sauria, Gekkonidae, Pulau Tioman, Malaysia.

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### INTRODUCTION

Kluge (1993) recognised 60 nominal species of *Cyrtodactylus* Hardwicke & Gray, 1827, which earlier workers, including Wermuth (1966), allocated to the genus *Gymnodactylus* Spix, 1825, then a catchall for many cyrtodactyline gekkonids (including *Cyrtopodion*, *Cyrtodactylus* and *Tenuidactylus*). The boundary of *Cyrtodactylus* remains poorly defined (Kluge, 1983), and seven additional species have been described subsequent to this work (Ulber, 1993; Darevsky and Szczerbak, 1997; Darevsky et al., 1997; Das, 1997; Schleich and Kästle, 1998), although some workers retained members of the genus in *Gonydactylus*, presumably following the scheme of classification in Kluge (1991). Although a presumed unnamed species of the genus was known to inhabit Pulau Tioman, an island off the east coast of Peninsular Malaysia (see Mäntey and Grossmann, 1997: 228; Lim and Lim, 1999), no attempt had been made to evaluate its systematic status. In the present paper, we examine

material from the island, compare it with congeners and supply a name for the taxon.

Pulau Tioman (02° 35'N; 104° 15'E) is a large (land area: ca. 133.6 km<sup>2</sup>) continental island, located ca. 32 km east of Mersing, Johore, in Pahang State, Peninsular Malaysia. The vegetation types on this island include coastal vegetation, mangrove swamps, and tropical rainforests as represented by lowland and hill dipterocarp formations (Latiff et al., 1999). Further details of the island can be found in Jasmi (1999) and Ng et al. (1999).

### MATERIALS AND METHODS

The following measurements were taken with a Mitutoyo dial caliper (to the nearest 0.01 mm): snout-vent length (SVL, from tip of snout to vent), forearm (FA, from elbow to palmar surface), tail length (TL, from vent to tip of unregenerated tail), tail width (TW, measured at base of tail), head length (HL,

distance between posterior edge of last supralabial and snout-tip), head width (HW, measured at angle of jaws), head depth (HD, maximum height of head, from occiput to throat), ear length (EL, greater ear length), body width (BW, greatest width of body), eye diameter (ED, greatest diameter of orbit), eye to nostril distance (E-N, distance between anteriormost point of eye and nostrils), eye to snout distance (E-S, distance between anteriormost point of eye and tip of snout), eye to ear distance (E-E, distance from anterior edge of ear opening to posterior corner of eyes), internarial distance (IN, distance between nares), and interorbital distance (IO, shortest distance between eyes). Observations of external morphology were made using a dissecting microscope. Comparative materials examined are given in Appendix I. Additional sources of information include: Inger (1957), Dring (1979), Hikida (1990), Manthey and Grossmann (1997), Smith (1935), Taylor (1963), Ulber (1993) and Ulber and Grossmann (1991). Institutional abbreviations (except for that of the Singapore collection, which we refer to as ZRC, following local usage of this abbreviations) follow Leviton et al. (1985). Sex was

confirmed through examination of gonads through dissection.

## SYSTEMATICS

### *Cyrtodactylus tiomanensis*, new species

(Figs. 1-2)

**Holotype.**- ZRC 2.3412 (adult male, with partially regenerated tail, bearing a mid-ventral incision), Kampung Tekek-Juara trail, Pulau Tioman (02° 35'N; 104° 15'E), Pahang, Malaysia. Coll. L. J. Lim, 16 Sep.1995.

**Paratypes.**- ZRC 2.3413a-b (both adult males), data as above; ZRC 2.3508-011 (three adult males, one adult female), Kampung Tekek-Juara trail, Pulau Tioman, Pahang, Malaysia. Coll. H. H. Tan, 28 Jun.1996; ZRC 2.3515 (juvenile), Gunung Kajang, Pulau Tioman, Pahang, Malaysia. Coll. L. J. Lim, 27 Jun.1996. Condition of tail in Table 1. Paratypes were sexed via a dorsolateral incision.

TABLE 1: Data on measurements (in mm) taken on the type series of *Cyrtodactylus tiomanensis*, new species. References to condition of tail: d = detached; o = original, intact; p = partially preserved original; r = regenerated.

	ZRC 2.3412	ZRC 2.3413.a	ZRC 2.3413.b	ZRC 2.3508	ZRC 2.3509	ZRC 2.3510	ZRC 2.3511	ZRC 2.3515
sex	male	male	male	male	male	male	female	juvenile
SVL	83.2	65.9	74.3	71.8	67.5	76.4	72.4	46.9
FA	14.9	9.9	11.5	12.8	11.1	12.9	12.9	7.5
TBL	16.3	12.7	15.6	15.9	14.0	15.1	14.5	9.1
TL	109.4 (r)	95.1 (o)	111.1 (o)	102.5 (o)	52.8 + (p)	89.9 (r)	112.5 (o)	60.8 (d)
TW	7.2	5.7	7.1	7.1	5.3	6.9	6.4	3.7
A-G	33.5	27.5	33.7	35.1	29.9	31.5	33.3	19.8
HL	14.8	11.8	14.5	13.8	12.6	15.2	12.8	10.2
HW	12.7	11.4	11.9	12.7	10.6	12.6	12.0	8.1
HD	8.8	7.7	8.3	7.7	7.2	8.7	7.9	5.3
ED	5.9	5.2	5.6	5.7	4.7	6.4	5.2	4.3
E-E	6.7	5.0	5.5	5.6	4.3	5.6	5.0	3.6
E-S	10.2	7.9	8.5	10.2	8.2	9.9	8.9	5.8
E-N	7.6	5.9	6.1	7.5	6.3	6.8	6.4	4.3
IO	6.9	5.2	5.0	6.5	4.1	4.5	4.6	3.6
EL	1.9	1.1	1.7	1.3	1.3	1.3	1.3	0.9
IN	3.0	2.3	2.7	2.9	2.3	2.8	2.4	1.9

**Diagnosis.**- A medium-sized (SVL to 83.2 mm), pale transverse banded species of *Cyrtodactylus*, which can be further differentiated from known congeners from south and south-east Asia in showing the following combination of characters: rostral partially divided by rostral groove, contacted posteriorly by two nostrils and two semi-circular supranasals; pectoral and abdominal scales smooth, rounded, semi-circular, imbricate; no preanal groove, a distinct preanal depression; sharp boundary between small scales on posterior surface of thighs and larger ones on ventral surface of thighs; tail without lateral denticles or tubercles forming whorls or segments; supralabials (to midorbit position) 8-11; infralabials 9-11; midventral scale rows at belly to lowest row of tubercles 36-40; lamellae under toe IV 20-22; preanofemoral pores 19; and dorsal pattern comprises four pale yellow transverse bands, each narrower than the intervening pale brown areas, edges with dark brown, and a pale yellow nuchal loop joining posterior edges of eyes.

**Description (based on holotype).** - snout-vent length 83.2 mm; head oblong, large (HL/SVL ratio 0.178); narrow (HW/SVL ratio 0.153); depressed on occipital region (HD/HL ratio 0.594); distinct from neck; lores and interorbital region flattened; snout long (E-S/HW ratio 0.803), longer than eye (ED/E-S ratio 0.578), scales on snout and forehead rounded, raised, scales on snout larger than those on occipital region; eye large (ED/HL ratio 0.399); orbits of eyes with extra-brillar fringes; pupil vertical *Gekko*-type (sensu Underwood, 1954); elongated supraciliaries on upper half of orbit; tympanum deep, oval, horizontally elongated (EL/HL ratio 0.128); eye to ear distance greater than diameter of eyes (E-E/ED ratio 1.136); rostral partially divided by dorsomedial groove which terminates in a Y-shaped bifurcation, wider (3.5 mm) than deep (2.4 mm), contacting posteriorly with nostrils, two semi-circular supranasals that are separated by two scales and supralabial I; nostrils oval, situated within nasals, oriented dorsolaterally; three postnasals bounding nasal; six scales separating orbit from supralabials. Mentals subtriangular, wider (3.3 mm) than deep (3.0 mm), postmentals paired, semicircular, contacting each other, smaller than mental, each bounded by eight rounded, smooth, juxtaposed scales posteriorly; series of nine enlarged scales separating infralabials from chin shields. Teeth regularly arranged, conical, slightly recurved, oriented posteriorly. Tongue narrow, elongate, with a median cleft.

Body slender, elongate (A-G/SVL ratio 0.403), scale size not decreasing dorsally after thorax; ventrally,

scales not decreasing in size from chin posteriorly. Gulars oval, juxtaposed. Scales at midbody smaller than ventral scales; scales on vertebral region not differentiated. Tubercles on dorsum weakly keeled. Pectoral and abdominal scales smooth, semi-circular, imbricate; 19 preanofemoral pores; no preanal groove, but with distinct preanal depression.

Scales on palm and sole smooth, oval; scales on inner surface of forearm and distal surface of upperarm smooth; scales on dorsal surfaces of thigh, tibia, upperarm and forearm weakly keeled, with scattered enlarged scales.

Forelimbs moderately long, slender; forearm short; hindlimbs relatively short; tibia short (TBL/SVL ratio 0.196). Digits elongate, all bearing claws that are slightly recurved; subdigital scansors smooth, entire, except for two to three fragmented ones at base, unnotched; largest scansor on basal phalange x 3 as wide as adjacent scale; interdigital webbing vestigial; sharp boundary between small scales on posterior surface and larger scales on ventral surface of thigh. Scansors under digits (finger): 12, 16, 18, 17, 16; (toe) 12, 16, 18, 19, 16. Relative lengths (measurements in parentheses) of finger: IV (7.0) > III (6.5) > V (6.4) = II (6.4) > I (4.4); of toe: V (8.3) > IV (7.9) > III (7.4) > II (6.8) > I (4.1).

Tail partially regenerated, subcylindrical in cross-section, without lateral denticles or tubercles forming whorls or segments, but with a distinct pair of furrow laterally; tail base distinctly swollen, with cloacal spurs, each consisting of two weakly conical scales; scales in postanal region and at proximal part of tail base smooth, bearing a single pit; scales on ventral surface of tail smooth, juxtaposed.

**Scutellation and miscellaneous characters (holotype, followed by the range shown by the paratypes in parentheses).** - Supralabials (to midorbit position) 9 (8-11); infralabials 11 (9-11); midventral scale rows at belly to lowest row of tubercles 36 (36-40); lamellae under toe IV 21 (20-22); preanofemoral pores 19 (19, in adult males only); postcloacal spurs 2 (1-2) pairs.

**Colouration.** - In formalin, forehead pale brown, a dark brown temporal patch; a pale yellow nuchal loop, joining posterior edge of eye; body with four dark brown edged pale yellow transverse bands, each narrower than the pale brown interspace; uppersurfaces of limbs pale brown, unbanded; digits unpatterned pale brown. Original portion of tail with four pale bands; proximal two of them show dark



Fig. 1. The holotype of *Cyrtodactylus tiomanensis* (ZRC 2.3412). Marker = 10 mm.

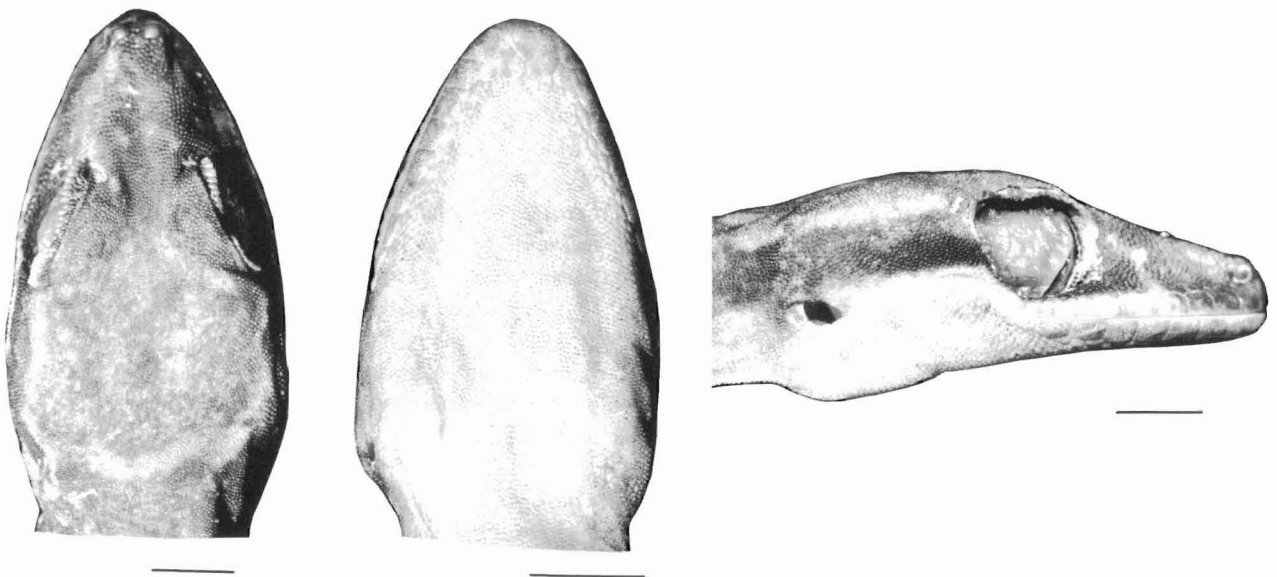


Fig. 2. Head of the holotype of *Cyrtodactylus tiomanensis* (ZRC 2.3412), in dorsal (left), ventral (middle) and lateral (right) views. Markers = 5 mm.

blotches on the vertebral region. Venter unpatterned cream, each scale with 2-7 minute black spots on ventral surfaces of body, limbs and tail. Tongue with grey melanophores distally, pink basally. The juvenile (ZRC 2.3515) has a darker base colour than the adults, that obscures the dark-edges of the transverse pale bands. The forehead is chocolate brown.

**Natural history notes.** - ZRC 2.308-11 were collected between 2000-2100 hours, from tree trunks and moss-covered granitic boulders that flank the lower part of the Tekek part of the Tekek-Juara trail, and were more abundant on rocks (Tan H. H. pers. comm., 1999). ZRC 2.3515 was found on a boulder near a stream at ca. 2030 hours. The altitudinal range of the species varies from ca. 50-150 m asl.

The herpetofauna of Pulau Tioman has been the subject of several investigations (see Hendrickson, 1966; Bullock, 1966). Manthey and Grossmann (1997: 228) reported *Cyrtodactylus quadrivirgatus* from the island, indicating that at least two congeneric species are sympatric on this island.

**Etymology.** - For the island of Pulau Tioman, the type locality of the new species.

## COMPARISONS

In the following section, the new species is compared with congeners from south-east and south Asia. For brevity, only opposing suites of characters are listed.

*Cyrtodactylus adleri* Das, 1997, distribution: Nicobar Islands, India: postnasals six, a series of 11-18 dorsal tubercles, dorsal pattern consisting of seven dark rounded blotches, midventral scale rows 48-50; *C. angularis* (Smith, 1921), distribution: Thailand: lateral fold of enlarged scales, ventrals imbricate, tail with whorls of enlarged scales, preanal pores six and distinct from femoral pores; dorsum with w-shaped dark marks; *C. baluensis* (Mocquard, 1890), distribution: Borneo: midventrals 40-45; femoral pores 6-9; preanal pores separated from femoral pores; *C. brevipalmatus* (Smith, 1923), distribution: Thailand, Cambodia and the Malay Peninsula: supralabials 12-13; lateral fold, consisting of enlarged scales, toes well webbed, tail with sharp lateral denticulations, preanal pores nine; femoral pores six; *C. cavernicolus* Inger & King, 1961, distribution: Borneo: supranasals three, preanal groove present, midventral scale rows 51-58, large scales on venter of thigh merge gradually with

smaller ones on dorsal part; *C. condorensis* (Smith, 1920), distribution: Vietnam: middorsal tubercles 25, postnasals three, three-scaled postcloacal spur, ventrals imbricate, preanal pores four to five; *C. consobrinoides* (Annandale, 1905), distribution: Myanmar: midventral scale rows 24-30, preanal pores four, enlarged femoral scales, dorsum with seven narrow, dark brown, white-edged transverse markings; *C. consobrinus* (Peters, 1871), distribution: the Malay Peninsula and Borneo: midventral scale rows 58-65, large scales on venter of thigh merging gradually with smaller ones on dorsal part; *C. elok* Dring, 1979, distribution: the Malay Peninsula: midventral scale rows 44, middorsal tubercles six to eight; *C. fumosus* (Müller, 1895), distribution: Java, Sulawesi and Halmahera in Indonesia: dorsum comprises narrow, dark transverse bars, without paler edges, preanofemoral pores 21-26; *C. ingeri* Hikida, 1990, distribution: Borneo: midventral scale rows 40-43, ventrals juxtaposed, large scales on venter of thigh merging gradually with smaller ones on dorsal part; *C. interditalis* Ulber, 1993, distribution: Thailand: dorsum with dark cross-bars; midventrals 37-42; preanal pores 7; separated from femoral pores; *C. intermedius* Smith, 1917, distribution: Thailand and Cambodia: supranasals three, a lateral fold of enlarged scales; median series of subcaudals widened, midventral scale rows 40-50, middorsal tubercles 17, preanal pores 8-10; and separate from femoral pores; *C. jarujini* Ulber, 1993, distribution: Thailand: preanofemoral pores 52, dorsum with dark blotches; *C. khasiensis* Jerdon, 1870, distribution: Bhutan, Bangladesh, India and Myanmar: lateral fold of enlarged scales, preanal pores eight to 14, dorsal pattern consisting of dark chain-marks or blotches; *C. lateralis* (Werner, 1896), distribution: Sumatra: midventral scale rows 62-64, preanal pores 13, separate from femoral pores; *C. malayanus* (De Rooij, 1915); distribution: Borneo: midventral scale rows 58-62, large scales on venter of thigh merging gradually with smaller ones on dorsal part; *C. marmoratus* Gray, 1831, distribution: Sumatra and Java: preanal groove present; enlarged scales on snout; *C. matsuii* Hikida, 1990, distribution: Borneo: midventral scale rows 51, ventrals juxtaposed; *C. oldhami* (Theobald, 1876), distribution: Myanmar and Thailand: median series of lamellae transversely enlarged, supralabials 12-13, tail with paired series of enlarged tubercles; preanal pores up to four, separated from femoral pores, femoral scales enlarged, dorsum with pale blotches; *C. papilionoides* Ulber, 1993, distribution: Thailand: dorsum with dark blotches; preanofemoral pores 29-33; midventrals 30-34; *C. paradoxus* Darevsky and Szczerbak, 1997,

distribution: Phu Quoc Island, Vietnam : males lack preanal and femoral pores; midventral scale rows 26-36; lamellae under toe IV 17-23; a median series of transversely widened subcaudal scales; and irregular cross-bars on dorsum; *C. peguensis* (Boulenger, 1893), distribution: Myanmar, Thailand and the Malay Peninsula: median subcaudals widened, midventral scale rows 32, ventrals imbricate, preanal pores seven to eight; *C. pubisulcus* Inger, 1958, distribution: Borneo: deep preanal groove present, midventral scale rows 43-55, large scales on venter of thigh merging gradually with smaller ones on dorsal part; *C. pulchellus* Gray, 1827, distribution: Myanmar, Thailand and the Malay Peninsula: preanal groove present, subcaudals transversely enlarged, two enlarged postnasals contacting nostril, dorsal pattern consisting of dark bands that have narrow yellow edges; *C. quadrivirgatus* Taylor, 1962, distribution: Thailand and the Malay Peninsula: 18-20 middorsal tubercles, dorsal pattern consisting of longitudinal stripes; *C. rubidus* (Blyth, 1860), distribution: Andaman Islands, India: four postnasals, a series of 20-23 dorsal tubercles, three scales comprise postcloacal spurs, narrow preanal groove present, dorsal pattern comprises dark transverse bands; *C. sworderi* (Smith, 1925), distribution: the Malay Peninsula: midventral scale rows 42-48, dorsum with pale blotches; and *C. variegatus* (Blyth, 1859), distribution: Myanmar: tail dorsum with whorls of enlarged scales; midventral scale rows 22, ventrals imbricate, preanofemoral pores 32; large scales on venter of thigh merging gradually with smaller ones on dorsal part.

#### ACKNOWLEDGEMENTS

For permitting us to examine material under their care, we thank American Museum of Natural History, AMNH, New York (Linda Ford, Darrel R. Fröst, David Dickey and Margarete Arnold); The Academy of Natural Sciences, ANSP, Philadelphia (Ned Gilmore); Brunei Museum, BM, Bandar Seri Begawan (Haji Jaya, Marina Wong and Haji Bakariah), Natural History Museum, London, BMNH, London (E. Nicholas Arnold and Colin J. McCarthy), Bernice P. Bishop Museum, BPBM (Carla H. Kishinami); Field Museum of Natural History, FMNH, Chicago (Harold K. Voris, Robert F. Inger, Alan Resetar and Cass Redhed), University of Kansas, Museum of Natural History, KU (W. E. Duellman and J. Mendelson); Museum of Comparative Zoology, Harvard University, MCZ, Cambridge, MA (John E. Cadle, Ernst E. Williams

and José P. Rosado), Sarawak Museum, SM, Kuching (Peter Kedit and Charles Leh), Sabah State Museum, SSM, Kota Kinabalu (Anna Wong), Borneensis Collection, Universiti Malaysia Sabah, UMS (which also includes the collection of the erstwhile Universiti Kebangsaan Malaysia, Sabah Campus, UKMS), Kota Kinabalu (Maryati Mohammed, Axel Poulsen, Ahmed Sudin and Lucy Kimsui); Universiti Brunei Darussalam UBD, Bandar Seri Begawan (Joseph K. Charles, David Edwards and Helen Pang); Florida Museum of Natural History, UF, Gainesville (Frederick Wayne King and David Auth); Raffles Museum of Biodiversity Research, University of Singapore, Department of Zoology, ZRC, Singapore (Peter Ng, C. M. Yang and Kelvin K. P. Lim); the United States National Museum, USNM, Washington, D.C. (W. Ronald Heyer, Ronald I. Crombie and George R. Zug) and Zoological Survey of India, ZSI, Calcutta (J. R. B. Alfred, Shyamal K. Chanda, Basudeb Dattagupta and N. C. Gayen).

Our respective institutions (Universiti Malaysia Sarawak and National University of Singapore) supported our researches on the herpetology of Malaysia. Tan Heok Hui provided natural history information on the paratypes he collected. Finally, we thank Kelvin K. P. Lim for his encouragement during the preparation of this paper, and Aaron M. Bauer, Robert F. Inger and Hidetoshi Ota for comments.

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## APPENDIX I

## Comparative material examined

- Cyrtodactylus adleri* Das, 1997: ZSI 25057 (holotype); ZSI 25058 (paratype of *C. adleri*), from "1 km E Galathea River mouth, Great Nicobar Island (= Sambelong), India"; ZSI 25059 (paratype), from "Galathea National Park, Great Nicobar Island, India"; ZSI 25060 (paratype), from "Shompen Hut, Great Nicobar Island, India"; ZSI 25061 (paratype), from "circa two km E Kopen Heat (= Dakoank), Great Nicobar Island, India"; ZSI 23398 (paratype), from "Magar Nullah, 3 km W Campbell Bay, Great Nicobar, India"; ZSI 25117 (paratype), from "Great Nicobar, India".
- Cyrtodactylus angularis* (Smith, 1921): BPBM 3542-43. Ban Sakaerat, Pak Thong Chai, Korat, Thailand; MCZ 39044. Dong Paya Fai Mt., Thailand (paratype of *Gymnodactylus peguensis angularis*).
- Cyrtodactylus baluensis* (Mocquard, 1890): FMNH 109955. Batu Gading, Middle Baram, Sarawak, Malaysia; UBD 61, 229, 296, 302, 292, 529, 573, Batu Apoi, Temburong, Brunei Darussalam; USNM 130225 and ZRC 2.1116-21. Mount Kinabalu, Sabah, Malaysia; UMMZ 82930. Kiau, Mt. Kinabalu; SSM 0969-70; 0973-74; 0976-77. Hutan Simpan, Trus Madi, Tambunan; SSM 0989. SFI Mendolong, Sipitang; UMS 2455. Sayap, Kota Belud; FMNH 248493-94. Tawau District, Sabah, Malaysia.
- Cyrtodactylus brevipalmatus* (Smith, 1923): MCZ 39037. Khao Luang, Nakorn Sri Thammaraj, Thailand (syntype).
- Cyrtodactylus cavernicolus* Inger & King, 1961: FMNH 131501-10. Niah Caves, Sarawak, Malaysia.
- Cyrtodactylus condorensis* (Smith, 1920): USNM 165036-39. Con Son Island, Vietnam.
- Cyrtodactylus consobrinoides* (Annandale, 1905): ZSI 12741 (holotype). "Tavoy" (= Dawei, southern Myanmar).
- Cyrtodactylus consobrinus* (Peters, 1871): ZRC 2.3197. Kota Tinggi, Johore, Malaysia; FMNH 76248. Mount Matang; ZRC 2.1126. Baram River, Sarawak, Malaysia; FMNH 149147-240; 149615-

- 815; 188198-217; 188630-45; 195366-69; 195473; 221467-68. Nanga Tekalit, Mengiong River, Sarawak, Malaysia; CM 40028. Sungei Seran, Bintulu District, Sarawak, Malaysia; FMNH 159220. Bintulu, Sarawak, Malaysia; FMNH 119901. Subis Forest Reserve, Niah, Sarawak, Malaysia; CM 40028; FMNH 149131-43; 149816-62; MCZ 102031. Labang Camp on Sungei Seran, Fourth Division, Sarawak, Malaysia; FMNH 149144-46. Sungei Nyabau Camp, Nyabau Forest Reserve, Sarawak, Malaysia; FMNH 159156-219; 159221-22. Tubau Camp, Sungei Pesu, Fourth Division, Sarawak, Malaysia; FMNH 221432-66. Sungei Segaham, Seventh Division, Sarawak, Malaysia; MCZ 160784. 12.5 miles from Kuching, Semerjoh Forest Reserve, Sarawak, Malaysia; MCZ 55124. Mount Matang, Sarawak, Malaysia; UBD 256, 353, 437, Batu Apoi, Temburong, Brunei Darussalam; UBD 654. Andulau, Belait, Brunei Darussalam; SSM 0376, 0965. Hutan Simpan, Mandamai, Pitas, Kudat, Sabah, Malaysia; ZRC 2.1125. Beliton, Sabah, Malaysia; UMS 01742. Gunung Rava, Tawau, Sabah, Malaysia.
- Cyrtodactylus elok* Dring, 1979: KU 173086. Parit Buntar, Malaysia.
- Cyrtodactylus ingeri* Hikida, 1990: SSM 0513. Kinabalu National Park, Sabah, Malaysia; SSM 0378. Hutan Simpan, Mandamai, Pitas, Kudat, Sabah, Malaysia; FMNH 251802 and SSM unreg. Pulau Sipadan, Sabah, Malaysia; UBD 82, 231, 338, 694. Batu Apoi, Temburong, Brunei Darussalam.
- Cyrtodactylus intermedius* Smith, 1917: AMNH 43356 and MCZ 39040 (syntype). Khao Seab, Thailand; FMNH 177489. Thailand; FMNH 215981. Khao Soi Daow Wildlife Sanctuary, Chantaburi Province, Thailand; MCZ 39041. Koh Chong, Gulf of Siam, Thailand; MCZ 39042. Bockor, Cambodia.
- Cyrtodactylus khasiensis* Jerdon, 1870: ZSI 15716 (holotype of *Gymnodactylus himalayicus* Annandale, 1906). "Kurseong (5,000 ft.)" (in West Bengal State, eastern India).
- Cyrtodactylus lateralis* (Werner, 1896): MCZ 7502. Sumatra, Indonesia.
- Cyrtodactylus marmoratus* Gray, 1831: AMNH 2287 and MCZ 7591. Bogor, Java, Indonesia; AMNH 50977. Kawoh Komodjan, Java, Indonesia; MCZ 20975. Java, Indonesia; MCZ 8284. Palabuan Ratu, Java, Indonesia; MCZ 8038-39. Megamendoeng Mountain, Java, Indonesia.
- Cyrtodactylus matsuii* Hikida, 1990: FMNH 239565-98. Tambunan Sunsuron, Sabah, Malaysia; FMNH 239599-646; FMNH 243785. Mendolong, Sipitang, Sabah, Malaysia; FMNH 242469-70. Mt. Lumaku, Sipitang District, Sabah, Malaysia; FMNH 251009-10. Gunung Emas, Crocker Range National Park, Tambunan District, Sabah, Malaysia.
- Cyrtodactylus oldhami* (Theobald, 1876): ZSI 5858 (holotype), type locality unknown; FMNH 177072-73. Thailand; MCZ 39047. Klong Bang Lai, Thailand; MCZ 39048-49. Tasan, Isthmus of Kra, Thailand; ZSI 5517. Tenasserim, Myanmar; ZSI 12675 and 12660. Mintao, Tavoy District, Myanmar.
- Cyrtodactylus peguensis* (Boulenger, 1893): UF 96691-93. Thailand; MCZ 39050. Khao Luang, Nakhorn Sri Thammaraj, Thailand; MCZ 74103. Khao Chong, Trang, Thailand; USNM 26207. Thailand; ZSI 16719. East Yoma Forest Reserve, Thayet Myo District, Pegu Yomas, Myanmar; ZSI 17220. Henzada District, Arakan Yomas, Myanmar.
- Cyrtodactylus pubisulcus* Inger, 1958: USDZ 2.3384-86. Lambir Hills, Sarawak, Malaysia; USDZ 2.3394 and FMNH 223200. Bako National Park, Sarawak, Malaysia; ZRC 2.1166. Baram River, Sarawak, Malaysia; FMNH 221500-600. Sungei Segaham, Seventh Division, Sarawak, Malaysia; FMNH 76249-5-51. Sungei China, Mt. Matang, Sarawak, Malaysia; FMNH 119905-14; 119916; 128382-86; KU 58564. Subis Forest Reserve, Niah, Sarawak, Malaysia; FMNH 128363-72; 129499-505; 131513-14; 177659-60. Kampung/Sungei Tangap, Niah, Sarawak, Malaysia; FMNH 128381. Tandjong Datu, First Division, Sarawak, Malaysia; FMNH 149241-369; 188566-77; 195475; 221561-64. Nanga Tekalit, Mengiong River, Third Division, Sarawak, Malaysia; FMNH 149369-75. Sungei Nyabau Camp, Nyabau Forest Reserve, Fourth Division, Sarawak, Malaysia; AMNH 111888; FMNH 149376-424; 149852; 150464-600; 159223-24. Labang Camp, Sungei Seran, Fourth Division, Sarawak, Malaysia; AMNH 111889-95; FMNH 150526; 158832; 159225-493; KU 155743-50; MVZ 111788-95; UMMZ 154371-72). Tubau Camp, Sungei Pesu, Fourth Division, Sarawak, Malaysia; UBD 102, 218, 249, 252, 335, 351, 350, 374, 532. Batu Apoi, Temburong, Brunei Darussalam; UBD 598. Bukit Patoi, Temburong, Brunei Darussalam; BM 92/121, 92/133. Sungei Ingei, Belait, Brunei Darussalam; BM 92/160-161, 92/164, 92/171. Sungei Pendarman, 9 km Utara Temada, Brunei Darussalam; BM 91/48-49. Sungei Merembun, Brunei Darussalam; SSM 0962. Hutan Simpan Paitan, Sandakan, Sabah, Malaysia; SSM 0679. Sabah Museum Compound, Kota Kinabalu, Sabah, Malaysia. ANSP 26473. "Borneo".
- Cyrtodactylus pulchellus* Gray, 1827: UF 102913-14, Malaysia; MCZ 39045. Nakhorn Sri Thammaraj Mountains, Thailand; MCZ 39046. Betong Puket, Thailand; ZSI 5789. Johore, Malaysia; ZSI 15010. Bukit Kutu, Selangor, Malaysia; ZSI 15011. Gunung Anging, Negri Sembilan, Malaysia; ZRC 2.1168-70,



Penang Hill, Pulau Penang, Malaysia; ZRC 2.1171-77. Perak, Malaysia; ZRC 2.1180-81. Negri Sembilan, Malaysia; ZRC 2.1178-79. Ringlet, Cameron Hills, Malaysia.

*Cyrtodactylus quadrivirgatus* Taylor, 1962: FMNH 177197 (suspected to be a paratype of the species, possibly E. H. Taylor's field number 388M36). Fraser's Hill, Malaysia; FMNH 196076. Northern Thailand; ZRC 2.3283-84. Upper Pierce Reservoir, Singapore; ZRC 2.3296. Kuala Tahan, Pahang.

*Cyrtodactylus rubidus* (Blyth, 1860): BMNH 1906.8.10.5, MCZ 7134 and ZSI 15015. Narcondum Island, Andamans, India; BMNH 1931.6.13.6-9. Andamans, India; ZRC 2.4607-09; 2.4611-12. Madhuban, South Andaman Island, India; ZRC 2.4610. Shoal Bay, South Andaman Island, India; ZRC 2.4613. Panighat, South Andaman Island, India; ZSI 6208-10 (syntypes). Andaman Islands, India; ZSI 23397. Pahargaon, 5 km S. Port Blair, Andamans, India; ZSI 23007. A.F.D. Rest House compound, Chiriatapu, South Andamans, India; ZSI 20915.

Bugena, ca. 6 km W Kwate-tu-Kwage, Little Andamans, India; ZSI 20913. Nachuge, Little Andamans, India; ZSI 17901 and 17896. Port Blair, Andamans, India; ZSI 21184. Mannarghat, Andamans, India; ZSI 21180. Wrafters Creek, Baratang, Middle Andamans, India.

*Cyrtodactylus sworderi* (Smith, 1925): BPBM 7909 and 7912. Pulau Jarak, Perak State, Malaysia; BPBM 7251. Nee Soon, Singapore.

*Cyrtodactylus variegatus* (Blyth, 1859): ZSI 6188. Moulmein, Myanmar (holotype): ZSI 16732. Between Thingannyinaung and Sukli, Dawna Hills, Amherst District, Tenneserim, Myanmar.

*Cyrtodactylus yoshii* Hikida, 1990: FMNH 235118-47; FMNH 240620-31. Danum Valley Field Centre, Lahad Datu District, Sabah, Malaysia; FMNH 248068-71; FMNH 248102-05; FMNH 249767; FMNH 248978-81. Tawau Hills Park, Tawau District, Sabah, Malaysia; FMNH 249765-66; FMNH 249768; FMNH 251008. Poring, Kepungit Satu, Kinabalu Park, Sabah, Malaysia.