

# Records of Cook Islands Lizards

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**ABSTRACT:** The distribution of lizards across the islands of the Cook Islands group, in the southwest Pacific, is documented by a listing of museum voucher specimens. Some islands have not been fully surveyed for lizards but, to date, 14 species are known from the group - eight geckos and six skinks.

**KEYWORDS:** Lizard, gecko, skink, distribution, Cook Islands, Pacific

## Introduction

The Cook Islands are a group of small scattered islands in the south Pacific, between Tahiti to the east and Samoa and Tonga to the west. The southern Cook group comprises Rarotonga, Mangaia, Ma'uke, Miti'aro, 'Atiu, Takutea, Manuae (Hervey), Aitutaki and Palmerston. The northern Cooks comprise Pukapuka (Danger), Nassau, Suvarrow (Suvarov), Rakahanga, Manihiki and Penrhyn (Tongareva).

The lizards of the Cook Islands have received little attention. The Whitney South Sea Expedition visited Rarotonga and Suvarrow in 1923, and Nassau and Pukapuka in 1924, and the lizard specimens (except, for some reason, those from Suvarrow) were cited by Burt & Burt (1932). Other lizard faunal lists exist for Pukapuka (Slevin 1934), Manihiki (McCann 1974), Penrhyn (Clapp 1977) and for Rarotonga and Mangaia (Crombie & Steadman 1986).

The aim of this study is to document the distribution of lizards on the individual islands of the Cook group by listing voucher specimens from museums with Cook Islands holdings. Such a listing shows up the islands that have been poorly surveyed for lizards and will encourage future researchers to fill the gaps. It also provides a handy summary of museum holdings for researchers interested in particular species.

Ineich (1987) split the skink *Emoia cyanura* into two sibling species. The nomenclature of these species was re-adjusted by Ineich & Zug (1991), and they are currently called *E. cyanura* and *E. impar*. All pre-1987 voucher specimens of *E. cyanura* must be re-identified as one or other of the sibling species, and this is done here, where possible, for the Cook Islands.

## Materials and Methods

I collected lizards on Rarotonga, Mangaia, Aitutaki and 'Atiu in September-October 1995; the specimens are at Auckland Museum, Auckland (AIM). I obtained catalogue listings of (or other references to) Cook Islands lizards held by the following institutions: American Museum of Natural History, New York (AMNH); Australian Museum, Sydney (AMS); Bernice P. Bishop Museum, Hawaii (BPBM); California Academy of Sciences, San Francisco (CAS); Field Museum of Natural History, Chicago (FMNH); Moscow State University Zoological Museum, Moscow (MMSU) (I. Ineich, pers. comm.); Museum of New Zealand, Wellington (NMNZ); National Museum of Natural History, Washington DC (USNM); Natural History Museum, London (BMNH); Queensland Museum, Brisbane (QM); San Diego Natural History Museum, San Diego (SDSNH); and Senckenberg Museum, Frankfurt-am-Main (SMF).

Except for three important AMNH specimens (AMNH 29208, 41683, 41735), and those at AIM, NMNZ and QM, I did not personally examine the museum holdings, but took catalogue or published identities to be correct. Most museum holdings of pre-1987 *E. cyanura* have been re-determined by specialists (e.g., I. Ineich, R.N. Fisher), and specimens are cited in the present list only if they are marked in museum catalogues as having been recently checked. Thirty-two specimens of *E. cyanura* from Rarotonga and Mangaia cited by Crombie & Steadman (1986) were skeletonised and cannot now be re-determined (Zug pers. comm.). They are USNM 249748-56, 249759-61 and 249777-96.

## Results

### List of Species

Appendix 1 lists records of lizards on the various islands of the Cook group. The results are summarised in Tables 1 (geckos) and 2 (skinks). The voucher specimens (and other evidence) establish that the Cook Islands herpetofauna comprises at least 14 species: eight geckos (including an undescribed species) and six skinks.

Of the 15 main islands in the Cook group, the Snake-eyed Skink *Cryptoblepharus poecilopleurus* has been recorded from 11, the Oceanic Gecko *Gehyra oceanica* from 10, the Moth Skink *Lipinia noctua* and Sad Gecko *Lepidodactylus lugubris* from nine each, and the Stump-toed Gecko *Gehyra mutilata* from eight. The White-bellied Skink *Emoia cyanura* and Dusky-bellied Skink *E. impar*, a recently-recognised pair of cryptic species, are also widespread but precision on this point requires more voucher specimens.

Rarotonga, the largest island, has the biggest lizard fauna, with six geckos and five skinks. On present evidence, the islands with the next highest diversity of lizards are 'Atiu, Aitutaki and Pukapuka, with eight species each.

### Ecological Notes

Like Crombie & Steadman (1986), I found individuals of *L. lugubris* on Mangaia away from human habitations, and they were darker than individuals inside

**Table 1:** Summary of known distribution of the eight species of geckos on the islands of the Cook group.

Gm = *Gehyra mutilata*  
 Go = *G. oceanica*,  
 Hf = *Hemidactylus frenatus*  
 Hg = *H. garnotii*,  
 Ht = *Hemiphyllodactylus typus*  
 Ll = *Lepidodactylus lugubris*,  
 Lu = *Lepidodactylus* undescribed species,  
 Np = *Nactus pelagicus*  
 x = known from museum voucher specimens  
 o = G. McCormack, pers. comm.  
 ? = uncertain record (see Appendix 1).  
 No geckos are yet reported from Takutea, Manuae or Rakahanga.

|                       | Gm | Go | Hf | Hg | Ht | Ll | Lu | Np | Spp./<br>island |
|-----------------------|----|----|----|----|----|----|----|----|-----------------|
| <b>SOUTHERN COOKS</b> |    |    |    |    |    |    |    |    |                 |
| Rarotonga             | o  | x  | x  | x  | x  | x  |    |    | 6               |
| Mangaia               | x  | x  |    |    |    | x  |    |    | 3               |
| Ma'uke                | x  |    |    |    |    |    |    |    | 1               |
| Miti'aro              | x  | x  |    |    |    | x  |    |    | 3               |
| 'Atiu                 | x  | x  |    | x  |    | x  |    |    | 4               |
| Aitutaki              | x  | x  | x  |    |    | x  |    |    | 4               |
| Palmerston            |    | x  |    |    |    | x  |    |    | 2               |
| <b>NORTHERN COOKS</b> |    |    |    |    |    |    |    |    |                 |
| Pukapuka              | x  | x  |    |    |    | x  |    |    | 3               |
| Nassau                | ?  |    |    |    |    |    |    | x  | 1               |
| Suvarrow              |    | x  |    |    |    |    |    |    | 1               |
| Manihiki              | x  | x  |    |    |    | x  |    |    | 3               |
| Penrhyn               |    | x  |    |    |    | x  | x  |    | 3               |

No. islands on which recorded 8 10 2 2 1 9 1 1

**Table 2:** Summary of known distribution of the six species of skinks on the islands of the Cook group.

Cp = *Cryptoblepharus poecilopleurus*

Ea = *Emoia adpersa*

Ec = *E. cyanura*

Ei = *E. impar*

Et = *E. trossula*,

Ln = *Lipinia noctua*

x = known from museum voucher specimens

o = reported by Crombie & Steadman (1986)

? = reported as "*E. cyanura*" by Crombie & Steadman (1986) but could be *E. cyanura* and/or *E. impar*.

No skinks are yet reported from Takutea, Palmerston or Rakahanga.

|                       | Cp | Ea | Ec | Ei | Et | Ln | Spp./<br>island |
|-----------------------|----|----|----|----|----|----|-----------------|
| <b>SOUTHERN COOKS</b> |    |    |    |    |    |    |                 |
| Rarotonga             | x  |    | x  | x  | x  | x  | 5               |
| Mangaia               | x  |    | x  | x  |    | x  | 4               |
| Ma'uke                |    |    | ?  | ?  |    | o  | 2               |
| Miti'aro              | x  |    | x  |    |    | x  | 3               |
| 'Atiu                 | x  |    | x  | x  |    | x  | 4               |
| Manuae                | x  |    | ?  | ?  |    |    | 2               |
| Aitutaki              | x  |    | x  | x  |    | x  | 4               |
| <b>NORTHERN COOKS</b> |    |    |    |    |    |    |                 |
| Pukapuka              | x  | x  | x  | x  |    | x  | 5               |
| Nassau                | x  |    | x  | x  |    | x  | 4               |
| Suwarrow              | x  |    | x  | ?  |    | o  | 3               |
| Manihiki              | x  |    |    |    |    |    | 1               |
| Penrhyn               | x  |    | x  |    |    |    | 2               |

No. islands on  
which recorded    11  1  9  6  1  9

dwellings. Under the bark of dead trees at the summit (Rangimotia) near the centre of the island, I found individuals that were extremely dark-pigmented both dorsally and ventrally (voucher AIM H1840), even the underside of the tail having dark markings. This degree of pigmentation seemed to be more than just short-term skin-colour change. The individuals presumably belong to a clone other than Clone A of Ineich (1988), although I cannot be sure of which clone because the preserved voucher specimen is so dark that the dorsal pattern is obscured.

I recorded the house gecko fauna in three dwellings at which I stayed (at Arutanga, Aitutaki; Oneroa, Mangaia; Areora, 'Atiu) and at a house I visited one evening (at Mapumai, 'Atiu). Each dwelling had three species; *Lepidodactylus lugubris* and *Gehyra oceanica* were common to all, the Mapumai house had *Hemidactylus garnotii* and the others had *Gehyra mutilata*.

The ecological differences between *Emoia cyanura* and *E. impar*, first suggested by Ineich (1987), were very clear on Mangaia. In open, dry, grassy inland areas I found only *cyanura*; in forest of the *makatea* (raised coral limestone) I found only *impar*. Though the *impar* were in shady sites they avidly basked in any direct sunlight. The situation on Aitutaki was similar, and there I saw *impar* foraging up to 2 m above ground among leaves and branches of forest trees.

## Discussion

Museum voucher specimens do not yet give a complete picture of the distribution of lizards across the islands of the Cook group. There appear to be no museum collections of lizards from Takutea and Rakahanga. Other islands (Ma'uke, Manuae, Palmerston, Nassau, Suwarrow and Manihiki) have been poorly surveyed for lizards and are likely to have more species than indicated here.

Crombie & Steadman (1986) reported eight species of lizards from Rarotonga and Mangaia. This number now stands at 11, with the addition of *Hemidactylus frenatus* and *Hemiphyllodactylus typus*, and the recognition of *Emoia cyanura* and *E. impar* where previously only one species was recognised.

Among the geckos, the common pan-Pacific species *Gehyra oceanica* and *Lepidodactylus lugubris* probably

occur on every island in the Cook group. *Gehyna mutilata* may have been in the Cooks for only a few decades (Crombie & Steadman 1986) but is clearly already widespread. Another human commensal, the parthenogenetic Fox Gecko *Hemidactylus garnotii*, seems to be rare in the Cook Islands. *H. frenatus* is probably the most recently established gecko in the Cook group – its spread in the Pacific dates from the 1940s (Moritz *et al.* 1993). The Rarotonga specimen was collected in 1987 from Matareka (probably from a boarding hostel), inland from the main town and port. The Aitutaki specimens came from the wharf at Arutanga. *Hemiphyllodactylus typus* is hard to find and may be discovered on islands other than Rarotonga. It occurs further east on Pitcairn Island and in French Polynesia [see references in Gill (1993)]. It is puzzling that the Pacific Slender-toed Gecko *Nactus pelagicus*, so common in the islands west of the Cook group, is limited in its Cook Islands distribution. However, it is also rare further east in French Polynesia where it is known only from Tahiti and one other island (Ineich & Blanc 1989).

The undescribed *Lepidodactylus* from Penrhyn also occurs on numerous scattered islands between the Marshall Islands and French Polynesia (Radtkey *et al.* 1995), and it is said to be the paternal ancestor of at least some of the parthenogenetic clones of *L. lugubris*. After examining their dorsal pattern in 1990, Ineich (pers. comm. August 1996) believes that USNM 158330 and 158335 from Penrhyn (both females, and listed here under *L. lugubris*) belong to the same bisexual species as the males AMNH 41749 and USNM 158329 and 158331 (listed here as *Lepidodactylus*, undescribed).

The Micronesian Skink *Emoia adspersa* is difficult to find and may turn up on other islands of the northern Cooks. However, it occurs only west and north of the American Samoan archipelago (Gill *et al.* 1994), so it is unlikely to occur in the southern Cook Islands. The conspicuous Dandy Skink *E. trossula* seems genuinely limited to just one island within the Cook group. All skinks other than *E. adspersa* and *E. trossula* are likely to be found on every island.

On Rarotonga and Pukapuka, some individuals of *Emoia impar* are melanistic [the “bronze morphs”

of Crombie & Steadman (1986)]. They are so dark that the dorsal stripes are not (or scarcely) apparent. In 1990 Ineich scored six of 21 USNM specimens of *E. impar* from Rarotonga as melanistic to some degree (I. Ineich, pers. comm. 1996). He recorded four of nine MMSU specimens from Pukapuka as melanistic (Ineich, pers. comm. August 1996). Bronze morphs do not seem to occur among *impar* populations on other islands of the Cook group, or in populations of *E. cyanura* in the Cooks.

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## Appendix 1

Voucher specimens (or other evidence) for the occurrence of geckos and skinks on the islands of the Cook group. For key to museum abbreviations see Materials and Methods.  
SVL = snout-vent length.

### STUMP-TOED GECKO *Gebyra mutilata*.

*Rarotonga*: G. McCormack [pers. comm., in Crombie & Steadman (1986)] has recorded this species from Rarotonga.

*Mangaia*: AIM H1845. SDSNH 66130. USNM 249693-4.

*Ma'uke*: BPBM 10673.

*Miti'aro*: SDSNH 66067-70, 66082-4, 66101-3, 66112, 66248, 66252-3.

*'Atiu*: AIM H1866.

*Aitutaki*: AIM H1863.

*Pukapuka*: AMNH 41683; from the Danger Group (= Pukapuka or Nassau); coll. E.H. Bryan 29 Feb. 1924; SVL = 44.2 mm. CAS 72311.

*Manihiki*: NMNZ: 1 spec. unreg. (McCann 1974); now in poor condition but identity seems correct.

### OCEANIC GECKO *Gebyra oceanica*.

*Rarotonga*: AIM H1056, H1834-6, H1838. AMS R110106, R110116. BPBM 721, 1603. CAS 183320-1, 186259-64. NMNZ R809-10. SDSNH 66144, 67812. 14 USNM specimens listed by Crombie & Steadman (1986).

*Mangaia*: AIM H1843-4, H1846. SDSNH 66131-2, 66135, 66139-43, 66259-60. 11 USNM specimens listed by Crombie & Steadman (1986).

*Miti'aro*: SDSNH 66081, 66104-9, 66113, 66254-6.

*'Atiu*: AIM H1867. SDSNH 67813.

*Aitutaki*: AIM H1861-2. BMNH 83.11.26.107. FMNH 11662, 69610-1. SDSNH 66019, 66043, 66047-50, 66241.

*Palmerston*: NMNZ R982-4.

*Pukapuka*: CAS 72304-10, 85432.

*Suvarrow*: BPBM 1501.

*Manihiki*: NMNZ: 1 spec. unreg. (McCann 1974); identity confirmed.

*Penrhyn*: USNM 158322-4.

### HOUSE GECKO *Hemidactylus frenatus*.

*Rarotonga*: CAS 190613, Matareka, coll. W.N. Beckon 7.3.1987.

*Aitutaki*: AIM H1855-7, Arutanga wharf, coll. B.J. Gill 5.10.1995.

### FOX GECKO *Hemidactylus garnotii*.

*Rarotonga*: USNM 249660. 1-2 specimens of this species cited by Moritz *et al.* (1993) were from Rarotonga (T.J. Case, pers. comm. June 1996).

*'Atiu*: AIM H1868. 1-2 specimens of this species cited by

Moritz *et al.* (1993) were from 'Atiu (T.J. Case, pers. comm. June 1996).

### INDOPACIFIC TREE GECKO

#### *Hemiphyllodactylus typus*.

*Rarotonga*: SDSNH 67822, Avarua School, coll. T. Case & D. Bolger 28.9.1989. SDSNH 67823, Nihao [= Nikao?], coll. C. McConnell 12.12.1988. SDSNH 67824, Agriculture Building [Avarua?], coll. T. Case & D. Bolger 27.9.1989.

#### SAD GECKO *Lepidodactylus lugubris*.

[This is often called the "mourning" gecko, but the name is ambiguous in spoken English. "Sad" gecko was used by Loveridge (1946).]

*Rarotonga*: AIM H1055, H1832-3, H1837, H1839. AMS R110093-4, R110096, R110103-5, R110111, R110115. CAS 183336-41, 186446-88. FMNH 205961, 211870. NMNZ R808, R811. 13 USNM specimens listed by Crombie & Steadman (1986).

*Mangaia*: AIM H1840-2. SDSNH 66137. 12 USNM specimens listed by Crombie & Steadman (1986).

*Miti'aro*: SDSNH 66087-92, 66100, 66110, 66250-1.

*'Atiu*: AIM H1864-5.

*Aitutaki*: AIM H1847-54, H1858-60. BMNH 1971.1350-2. FMNH 207662-6, 211873. SDSNH 66020-2, 66034-5, 66041-2, 66242-3.

*Palmerston*: NMNZ R1000-1.

*Pukapuka*: AMNH 41684. CAS 72312-3.

*Manihiki*: NMNZ: 2 specs. unreg. (McCann 1974); identity confirmed.

*Penrhyn*: USNM 158325-6, 158328, 158330, 158332-8.

#### GECKO (UNDESCRIBED) *Lepidodactylus* sp. (see Radtkey *et al.* 1995)

*Penrhyn*: AMNH 41749. USNM 158329, 158331.

#### PACIFIC SLENDER-TOED GECKO *Nactus pelagicus*.

*Nassau*: AMNH 41735; coll. E.H. Bryan 17 May 1924; SVL = 29.6 mm.

#### SNAKE-EYED SKINK *Cryptoblepharus poecilopleurus*.

*Rarotonga*: USNM 252386-90.

*Mangaia*: AIM H1877-8. SDSNH 66124-6. USNM 249703-4, 249776.

*Miti'aro*: SDSNH 66072, 66075, 66099.

*'Atiu*: AIM H1906. SDSNH 67819-21.

*Manuae*: SMF 15654-8; reported by Mertens (1931) from "Mui, Cook-Inseln" [= Manuae, see Crombie & Steadman (1986)].

*Aitutaki*: AIM H1882-4, H1890-3. FMNH 69556-9. SDSNH 66018, 66033, 66053-9, 66240.

*Pukapuka*: AMNH 29183, 29204.

*Nassau*: AMNH 29210, 29220, 29225.

*Suvarrow*: BPBM 1500.

*Manibiki*: NMNZ: 3 specs. unreg. (McCann 1974); identity confirmed.

*Penrhyn*: USNM 158339.

**MICRONESIAN SKINK** *Emoia adpersa*.

*Pukapuka*: AMNH 29208; coll. R.H. Beck 3 Mar. 1924; SVL = 81.7 mm; mid-body scale rows 53; 4th-toe lamellae 26.

**WHITE-BELLIED SKINK** *Emoia cyanura*.

*Rarotonga*: BMNH 83.11.26.108. CAS 183331-2, 196383, 199867-91, 199912-21, 199941-6, 199952-9, 199981-2. SDSNH 66118, 67814-5. USNM 249671, 249676, 252392-400.

*Mangaia*: AIM H1873-5. CAS 199966-77. SDSNH 66119, 66121-2, 66136, 66138. USNM 249729-30, 252409.

*Miti'aro*: SDSNH 66073-4, 66247, 66249.

*Atiu*: AIM H1903. SDSNH 67816-8.

*Aitutaki*: AIM H1885, H1888-9, H1894, H1899. BPBM 5859. FMNH 69560, 69562-3, 69565-6, 69568-9, 69571-2, 69574-7, 69580-2, 69584, 69587-8, 69592-6, 69603-4, 211874. SDSNH 66030-2, 66060-1, 66063-5, 66244-6.

*Pukapuka*: AMNH 29171-5, 29177-80, 29184-6, 29189, 29194, 29198, 29200-3, 29205, 29207. CAS 72314, 72316-9, 72321, 72323, 72325-6, 72330-3, 85433-4, 85436. MMSU 8003-4, 8003-7, 8003-10, 8003-13 (I. Ineich, pers. comm. August 1996).

*Nassau*: AMNH 29209, 29211-9, 29221-2, 29224, 41722-6, 41728.

*Suvarrow*: AMNH 29084, 29100, 29104, 29106, 29109-10, 29117, 29124, 29128, 29131, 29138-9, 29145, 29153 (I. Ineich, pers. comm. August 1996).

*Penrhyn*: AMNH 41748. CAS 78784-93. USNM 158340-9.

**DUSKY-BELLIED SKINK** *Emoia impar*.

*Rarotonga*: AIM H1870-1. AMNH 29246-7 [listed by Burt & Burt (1932) under *E. cyanogaster*; mis-identification corrected by Brown (1956)]. CAS 183333-5, 183342-3, 196382, 199892-911, 199922-40, 199947-51, 199960-5, 199978-80. USNM 249667-70, 249672-3, 249677-86, 249688-92.

*Mangaia*: AIM H1879-81. SDSNH 66120, 66123. USNM 249705-28, 252406-8.

*Atiu*: AIM H1902, H1905.

*Aitutaki*: AIM H1887, H1895-8. FMNH 69561, 69564, 69567, 69570, 69573, 69578-9, 69583, 69585-6, 69589-91, 69597-602. SDSNH 66040, 66044, 66051-2, 66062, 66066.

*Pukapuka*: AMNH 29176, 29187-8, 29190-2, 29197, 29206. CAS 72315, 72320, 72322, 72324, 72327-9, 72334, 85435. MMSU 8003-1 to -3, 8003-5 to -6, 8003-8 to -9, 8003-11 to -12 (I. Ineich, pers. comm. August 1996).

*Nassau*: AMNH 29223, 29226.

**DANDY SKINK** *Emoia trossula*.

*Rarotonga*: AIM H1869. CAS 183322-7. Six specimens of this species from "Cook Islands" held by QM are presumably from Rarotonga: QM J42397 (coll. P. Prociv Feb. 1984), QM J45620-4 (coll. M. Jones 1985). SDSNH 66114-7, 66145-6, 66257, 66261-4. 11 USNM specimens listed by Crombie & Steadman (1986).

**MOTH SKINK** *Lipinia noctua*.

*Rarotonga*: AIM H1872. AMS R110092, R110097-101.

CAS 183328-30. NMNZ R807. SDSNH 67825-9.

USNM 249674-5, 249687, 249757-8, 252401-3.

*Mangaia*: AIM H1876. SDSNH 66127-9, 66133-4, 66258. USNM 249731, 249797-9, 252410-1.

*Ma'uke*: Reported by Crombie & Steadman (1986).

*Miti'aro*: SDSNH 66071, 66076-80, 66085-6, 66093-8, 66111.

*Atiu*: AIM H1900-1, H1904. SDSNH 67830-1.

*Aitutaki*: AIM H1886. FMNH 69605-9, 109937. SDSNH 66015-7, 66023-9, 66036-9, 66045-6.

*Pukapuka*: AMNH 29181-2, 29193, 29195-6, 29199. CAS 72335-8.

*Nassau*: AMNH 41727.

*Suvarrow*: Reported by Crombie & Steadman (1986).