



## Two new skinks (Scincidae: *Glaphyromorphus*) from rainforest habitats in north-eastern Australia

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### Abstract

Tropical rainforest is largely restricted in Australia to the fairly continuous Wet Tropics region and disconnected patches to the north on Cape York. The Wet Tropics is relatively well explored and studied, whereas the rainforests of Cape York have received less attention due to their remoteness. Here we describe two new species of *Glaphyromorphus* skinks from rainforest areas on Cape York. The two new species are most similar to each other and to *G. fuscicaudis* and *G. nigricaudis*, but both are readily diagnosed on numerous traits. *Glaphyromorphus othelarrni* **sp. nov.** is diagnosed from all similar species by its supralabial count (typically 8 vs 7), high number of subdigital lamellae beneath the 4<sup>th</sup> finger (14–15 vs < 14), and its relatively longer limbs. *Glaphyromorphus nyanchupinta* **sp. nov.** is diagnosed from all similar species by its small body size (max SVL = ~ 54 mm vs > 85 mm) and slender body shape, low number of subdigital lamellae beneath the 4<sup>th</sup> toe (17–20 vs generally 20 or more), and head and body pattern. Both species also differ from each other and similar congeners in other aspects of body shape, scalation and colour pattern. *Glaphyromorphus othelarrni* **sp. nov.** is restricted to boulder-strewn rainforest of the Melville Range, whilst *Glaphyromorphus nyanchupinta* **sp. nov.** is known only from upland rainforest in the McIlwraith Range. We discuss patterns of rainforest vertebrate endemism on Cape York, and the importance of lithoreugia in generating these.

**Key words:** *Glaphyromorphus othelarrni*, *Glaphyromorphus nyanchupinta*, Cape York, rainforest, boulder-field, lithoreugia, Queensland

### Introduction

Until recently, *Glaphyromorphus* Wells & Wellington, 1984 contained 18 species distributed in northern and south-western Australia, New Guinea and the Lesser Sundas. However, morphological and genetic data strongly suggested that the genus was polyphyletic (Greer 1989; Reeder 2003; Rabosky *et al.* 2007; Skinner 2007). Mecke *et al.* (2009) added to this data and reassigned 8 of the species to *Eremiascincus* Greer, 1979a or *Hemiergus* Wagler, 1830. This included five of the Australian species, four of which were reassigned to *Eremiascincus* and one to *Hemiergus*. This was supported by a more thorough genetic analysis by Skinner *et al.* (2013). *Glaphyromorphus* now contains nine Australian species: *G. cracens* (Greer, 1985), *G. darwiniensis* (Storr, 1967), *G. pumilus* (Boulenger, 1887), *G. crassicaudus* (Duméril & Duméril, 1851), *G. mjobergi* (Lönnerberg & Andersson, 1915), *G. punctulatus* Peters, 1871), *G. fuscicaudis* (Greer, 1979b), *G. nigricaudis* Macleay, 1877 and *G. clandestinus* Hoskin & Couper, 2004. Most of these species occur in north-eastern Queensland (Wilson & Swan 2013). While most *Glaphyromorphus* are slender-bodied and short-limbed, *G. nigricaudis* and *G. fuscicaudis* are more robust and longer limbed (Greer 1979b). Genetic analyses have revealed these to be sister-species (Mecke *et al.* 2009; Skinner *et al.* 2013). *Glaphyromorphus nigricaudis* is widespread in moister habitats in north Queensland, north-eastern Arnhem Land and southern New Guinea, while *G. fuscicaudis* is restricted to rainforests of the Wet Tropics.

In Australia, tropical rainforest is largely restricted to a fairly continuous 430 km strip along the mountains and associated lowlands between Townsville and Cooktown (termed the ‘Wet Tropics’), and smaller and more disjunct patches to the north of Cooktown on Cape York Peninsula. The Wet Tropics has been explored in detail and has

*Glaphyromorphus othelarrni* **sp. nov.** does not live on exposed rock surfaces but it was always found living amongst boulders. Although its limbs aren't long as seen in true boulder-adapted lizards at Cape Melville (Covacevich & Ingram 1978; Hoskin 2013a; Hoskin & Couper 2013), it nonetheless conforms to the predicted pattern of relatively long legs compared to sister species (Table 1). As for most other Cape Melville vertebrate endemics (Davies & McDonald 1998; Hoskin 2013a, 2013b; Hoskin & Couper 2013), this suggests a long history of association with rock and highlights the importance of rock landscapes for the persistence of rainforest lineages (Couper & Hoskin 2008). While rainforest refugia of substantial size persisted in the Wet Tropics through the cool, dry glacial maxima (e.g., VanDerWal *et al.* 2009), it is likely that rainforest and associated biota contracted to tiny areas on Cape York during restrictive climatic periods. While the large upland area of McIlwraith Range is likely to have retained small rainforest refugia (and rainforest lineages like *Cophixalus crepitans* Zweifel 1985 and *G. nyanchupinta* **sp. nov.** that are not rock-associated), in other areas (e.g., Cape Melville) persistence would have been reliant on the cool, moist conditions offered by deeply layered rock environments—lithoreugia (Couper & Hoskin 2008). Over extended periods in these rocky environments, the fauna adapted to a largely rock-associated morphology and lifestyle, such that even under more expansive current climatic conditions many of these species remain restricted to rock habitats and absent from the surrounding rainforest lacking rocks.

### A key to the *Glaphyromorphus nigricaudis* group of north-eastern Australia

Group defined as having: adpressed limbs overlapping or separated by at most the length of forelimb, 24 or more midbody scale rows, and prefrontal not contacting first preocular scale.

1. Body size small (SVL ~ 50 mm); dark barred pattern on dorsal and lateral surfaces of the body, extending posteriorly to groin; supralabials predominantly dark ..... *nyanchupinta*
- Body size large (SVL ~ 70–90 mm); dark barred pattern not extending to groin; supralabials predominantly pale with dark sutures ..... 2
2. Eight supralabial scales with 6<sup>th</sup> below centre of eye, and more than 14 subdigital lamellae beneath 4<sup>th</sup> finger ..... *othelarrni*
- Seven supralabial scales with 5<sup>th</sup> below centre of eye, and less than 14 subdigital lamellae beneath 4<sup>th</sup> finger. .... 3
3. 59–70 paravertebral scale rows; a series of pale or yellowish dorsolateral blotches present on shoulders ..... *fuscicaudis*
- 51–58 paravertebral scale rows; no series of yellowish dorsolateral blotches on shoulders ..... *nigricaudis*

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## APPENDIX. Additional material examined.

***Glaphyromorphus fuscicaudis***: QMJ25218, Mt Finnigan summit (15°49'10" S, 145°17'05" E); QMJ29074–075, Danbulla SF, 'A' Rd (17°07' S, 145°38' E); QMJ29076–077, Lake Eacham NP (17°16'57" S, 145°37'46" E); QMJ48700, Gadgarra SF, Bull Ck (17°17'30" S, 145°41'30" E); QMJ51995, Mt Molloy (16°41' S, 145°20' E); QMJ58119, Mt Pieter Botte (16°04' S, 145°25' E); QMJ60638, Mt Boolbun South, via Cooktown (15°56' S, 145°09' E); QMJ60739, Windsor Tableland (16°17'30" S, 145°05'30" E); QMJ61842, Stagers Rd, base of Mt Bartle Frere (17°23' S, 145°46' E); QMJ75147, Mt Lewis SF, SW slope of Mt. Lewis (16°35'25" S, 145°16'15" E); QMJ89914, Black Mountain Rd, N of Kuranda (16°47' S, 145° 37'54" E); QMJ89915, Black Mtn Rd, south of Forestry Hut (16°45'58" S, 145°37' E). ***Glaphyromorphus nigricaudis***: QMJ47100, Cairns (16°55' S, 145°46' E); QMJ63520, Cape Melville NP (14°17'03" S, 144°27'31" E); QMJ69394, Haggerstone Is. (12°02' S; 143°18' E); QMJ86368, Masig Is., Yorke Islands (09°45' S, 143°24' E); QMJ87578, Muck River (14°18'45" S, 144°26'22" E); QMJ87881, Bluebottle Spring, Steve Irwin Wildlife Reserve (12°20' S, 142°14'14" E); QMJ87921, Oasis Spring, Steve Irwin Wildlife Reserve (12°20'24" S, 142°15'05" E); QMJ87973, Ling Ck, Steve Irwin Wildlife Reserve (12°18'01" S, 142°15'15" E); QMJ89482, Kennedy Hills, north of Pascoe R. (12°28' S, 143°16'12" E); QMJ92549, Altanmoui Range (14°31'27" S, 144°37'17" E).