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A new species of death adder (*Acanthophis*: Serpentes: Elapidae) from north-western Australia

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Abstract

Australian death adders (genus *Acanthophis*) are highly venomous snakes with conservative morphology and sit-and-wait predatory habits, with only moderate taxonomic diversity that nevertheless remains incompletely understood. Analyses of mitochondrial and nuclear gene sequences and morphological characteristics of death adders in northern Australia reveal the existence of a new species from the Kimberley region of Western Australia and the Northern Territory, which we describe as *Acanthophis cryptamydros* **sp. nov.** Although populations from the Kimberley were previously considered conspecific with Northern Territory death adders of the *A. rugosus* complex, our mtDNA analysis indicates that its closest relatives are desert death adders, *A. pyrrhus*. We found that *A. cryptamydros* **sp. nov.** is distinct in both mtDNA and nDNA analysis, and possesses multiple morphological characteristics that allow it to be distinguished from all other *Acanthophis* species. This study further supports the Kimberley region as an area with high endemic biodiversity.

Key words: Australian Monsoonal Tropics, mtDNA, nDNA, systematics, taxonomy, *Acanthophis cryptamydros* **sp. nov.**

Introduction

The Kimberley region in north-western Australia is an area of high endemism (Slatyer *et al.* 2007; Bowman *et al.* 2010; Powney *et al.* 2010; Palmer *et al.* 2013; Pepper & Keogh 2014). Ongoing collections of animal and plant groups in recent years has led to the identification of many new species (e.g., frogs: Anstis *et al.* 2010; Doughty 2011; lizards: Doughty *et al.* 2012; Oliver *et al.* 2012, 2014; Pepper *et al.* 2011; snails: Köhler 2010, 2011; flowering plants: Barrett *et al.* 2009; Carlson *et al.* 2011; Maslin *et al.* 2013). Snakes have received some attention in the Kimberley region of Western Australia and the Australian Monsoonal Tropics (e.g. *Pseudechis*: Kuch *et al.* 2005; *Demansia*: Shea & Scanlon 2007; *Anilius*: Marin *et al.* 2013), yet many genera have not been subject to extensive systematic revision recently.

The death adders, *Acanthophis* Daudin, 1803 are a widespread genus of elapid snakes distributed across Australia and New Guinea, and on several Indonesian islands to the west of New Guinea. Although the genus is highly distinctive due to its convergent viper-like morphology and ecology (Shine 1980; Greer 1997), species limits within the genus have remained poorly understood (Storr 1981; McDowell 1984; Aplin & Donnellan 1999; Wüster *et al.* 2005), partly due to extensive polymorphism within many species and even populations (e.g., Johnston 1996).

The systematics of the death adders from the Australian Monsoonal Tropics (northern Queensland, the Top End of the Northern Territory and the Kimberley region in northern Western Australia) have proven especially complex. While *A. pyrrhus* Boulenger, 1898 from the arid zone is highly distinctive, and *A. wellsi* Hoser, 1998 from the Pilbara region in Western Australia was discovered, defined and shown to be a clearly diagnosable, valid