The king cobra, *Ophiophagus hannah* (Cantor), occurs throughout tropical Asia, ranging from India eastward to Vietnam and southern China, and from the Philippines southward through Malaysia and Indonesia (Anonymous, 1991; Ernst and Zug, 1996). Barnard and Durden (2000) cite six tick species from *O. hannah*: *Amblyomma cordiferum*, *A. helvolum*, *Aponomma flavomaculatum*, *A. latum*, *A. pattoni* and *A. varanense*. In a recent checklist of the ticks of the world, Horak, Camicas and Keirans (2002) synonymized the genus *Aponomma* under *Amblyomma*; however, this modification has not been accepted by all authorities and is not employed here.

In April 2007, an adult (total length ≈ 4m) king cobra was exported from Malaysia to Taiwan. While the snake was in quarantine, six ticks were collected from the floor of its cage: *Amblyomma cordiferum* (one female), and *Aponomma varanense* (two males and three females). This appears to be the first report of the accidental transportation of ticks into Taiwan on imported reptiles.

**Amblyomma cordiferum** is a rare tick species known from Indonesia, Malaysia, Singapore, Taiwan, Thailand, and Western Samoa (Barnard and Durden, 2000; Voltzit and Keirans, 2002; Robbins, 2005). It is also one of the few ticks known to reproduce parthenogenetically (Ho and Ismail 1984; Oliver, 1989; Voltzit and Keirans, 2002; Kolonin, 2004). Under laboratory conditions, *A. cordiferum* can complete its life cycle in 168-209 days (Ho and Ismail 1984). Immature specimens apparently feed on rodents (Ho and Ismail, 1984; Oliver, 1989; Barnard and Durden, 2000), while adults appear to prefer ophidian hosts and have been reported from several snake species in the past: *Ophiophagus hannah*, *Python reticulatus*, *Ptyas mucosa* and *Orthriophis taeniurus friesi* (Barnard and Durden, 2000; Norval et al., 2005; Norval et al., 2008). In Malaysia, *A. cordiferum* has also been reported to be the carrier of an unidentified virus (Audy, Nadchatram and Lim, 1960; Nadchatram, 1960), which implies that tick specimens introduced from Malaysia could potentially pass the pathogen to Taiwan.

**Aponomma varanense** is one of the most widespread members of its genus, occurring in Bangladesh, Cambodia, China, India, Indonesia, Malaysia, Myanmar, Papua New Guinea, the Philippines, Singapore, Sri Lanka, Thailand, and Vietnam (Burridge, 2001). Although it has not been recorded on the main island of Taiwan, it has been collected from the Penghu archipelago (Robbins, 1996). *A. varanense* is primarily a tick of monitor lizards and large snakes (Kolonin, 2004), but it has also been collected from chelonians and mammals (Kaufman, 1972; Burridge, 2001).
Burridge (2001) stated that *A. varanense* has the potential to spread outside its natural geographic range to new reptile hosts, and Simmons and Burridge (2000) reported that in Florida this tick has disseminated beyond importation facilities. Although the ornamentation in males of *A. varanense* is variable (Kaufman, 1972; Robbins, 1996), this species generally bears metallic yellowish-green markings on a reddish-brown scutum (Burridge, 2001). The one retained male from our sample is virtually inornate (Fig. 2), illustrating the difficulties that may arise when attempting to identify small numbers of specimens.

Ectoparasites, especially mites and ticks, are often seen on snakes in the wild (Ernst and Zug, 1996), and like other parasitic forms, the infection rates and the effects they have on their hosts have been poorly studied (Zug, Vitt and Caldwell, 2001). Although ticks rarely occur in numbers large enough to cause serious blood loss in reptile hosts or other direct injuries (Rundquist, 1995; Lane and Mader, 1999), they can be carriers of vector-borne diseases (Klingenberg, 1993; Lane and Mader, 1999), which can sometimes be transmitted to other animals, including humans (Karesh et al., 2005; Pietzsch et al., 2006). Because of increased international trade in wild reptiles (Auliya, 2003; Shiau et al., 2006; Schlaepfer, Hoover and Dodd, 2005; Soorae et al., 2008),

Figure 1. The king cobra, *Ophiophagus hannah*, is the world’s largest venomous snake. This male, found near Galibeedu, Coorg District, Karnataka State, India, was about the same size as the tick-infested individual discussed herein.

Figure 2. An almost inornate male *Aponomma varanense* (left), collected from the king cobra in quarantine, and a conspecific ornate male from Singapore, illustrating why morphology, as opposed to coloration, is used by tick taxonomists for species identification.
there is a high risk that exotic ticks and the pathogens they carry may become established in new geographic areas (Burridge, 2001; Simmons and Burridge, 2000; Simmons and Burridge, 2002; González-Acuña et al., 2005).

Simmons, Stadler and Burridge (2002) reported a case in which *A. helvolum* accidentally entered the United States on imported *O. hannah*. Thus, our report is not the first instance of ticks being introduced into a new geographic area on this snake species. However, ours does appear to be the first instance of accidental transportation of ticks into Taiwan on an imported reptile, demonstrating the ease with which ticks can gain access to new areas through the trade in wildlife.

We encourage the examination of ticks whenever they are found on reptiles. The number of specimens and their locations on the host’s body should be noted, as well as data on the age, sex, size and physiological condition of the host. Such information would enhance interdisciplinary cooperation among specialists and, on a practical level, improve the wildlife inspection process, thereby minimizing the risk of importing potential disease vectors.

One male and two female *A. varanense* from *O. hannah* have been deposited in the Division of Entomology, Peabody Museum of Natural History, Yale University, New Haven, Connecticut, USA (accession number YPM 300712).

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**References**


