

# RESEARCH COMMUNICATION

# The prevalence and distribution of *Argas walkerae* (Acari: Argasidae) in the eastern region of the Eastern Cape Province, South Africa

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### **ABSTRACT**

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The prevalence and geographic distribution of the fowl tampan, *Argas walkerae* Kaiser & Hoogstraal, 1969 was determined in the eastern region of the Eastern Cape Province, South Africa by inspecting two fowl houses in the vicinity of each of 72 randomly selected communal cattle dip-tanks. Tampans were collected from 102 (70.8%) of the 144 fowl houses in the neighbourhood of 57 (79.2%) of the 72 selected dip-tanks, and the localities of the collections were mapped. *Argas walkerae* was present in fowl houses from the warm coastal regions of the Indian Ocean in the south to the cold and mountainous Drakensberg in the north-east of the Province. Taking into account the probable sensitivity of the sampling method, it is estimated that *A. walkerae* is likely to be present in fowl houses belonging to between 74 and 84% of communities making use of cattle dip-tanks in the eastern region of the Eastern Cape Province, and that when it is present, between 64 and 75% of fowl houses will be infested. The geographic distribution of *A. walkerae* seemed to be more strongly associated with the presence of fowls and fowl houses containing raw or processed wood in their structure than with climate

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Its colloquial name, fowl tampan, describes both the preferred hosts of *Argas walkerae* Kaiser & Hoog-

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straal, 1969 and the tick family to which it belongs. According to Norval, Short & Chisholm (1985) it is the most important ectoparasite of fowls in Zimbabwe and is the cause of considerable losses to peasant farmers and others. Gothe & Schrecke (1972) have demonstrated that A. walkerae can be infected with Aegyptiannella pullorum, the cause of fowl aegyptiannellosis, and with Borrelia anserina, the cause of fowl spirochaetosis, and Huchzermeyer (1972) suggested that the possibility of it transmitting Pasteurella avicida, the cause of fowl cholera, should be investigated. Gothe (1999) has induced paralysis in domestic chickens by feeding larvae of various wild strains of A. walkerae as well as those of a laboratory strain on them. In addition the fourth stage nymphs and the adults can imbibe considerable quantities of blood.

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Lounsbury (1895) originally identified the southern African fowl tampan as Argas reflexus (Fabricius, 1794), but later changed this to Argas persicus (Oken, 1818) (Lounsbury 1903). However, after examining numerous specimens from several localities in southern Africa, Kaiser & Hoogstraal (1969) came to the conclusion that these belonged to a new species, which they named Argas walkerae. Furthermore they expressed their doubts as to whether A. persicus did indeed occur in southern Africa, because all the collections that they had examined from this region proved to be A. walkerae. They reported collections from Fort Beaufort and Queenstown in the Eastern Cape Province, Onderstepoort and Pretoria North in Gauteng Province and Christiana, North West Province, all in South Africa, as well as from a farm close to Omaruru in Namibia and from Maseru in Lesotho. Eastwood (1971) has reported A. walkerae from Beit Bridge in Zimbabwe, and Huchzermeyer (1972) records it from Chinhoyi and Bulawayo, while Norval et al. (1985) have mapped its widespread distribution in that country.

Norval *et al.* (1985) state that *A. walkerae* is common in resource-poor and 'backyard' situations, where fowl runs are constructed from poles, planks, grass, loose bricks or stones and any other materials at hand. They also noted the seasonal occurrence of its larvae on fowls and all its developmental stages on or in the various structures comprising an experimental fowl run.

The present survey records the prevalence and geographic distribution of *A. walkerae* in the rural eastern region of the Eastern Cape Province, South Africa. It was conducted within four municipal districts that completely or partially lie within this region, namely Alfred Nzo, Amatole, Chris Hani and O.R. Tambo. The sampling sites were fowl houses or roosts in the vicinity of 72 communal cattle dip-tanks that had been selected by means of tables of random numbers. Two fowl houses in the vicinity of each of the cattle dip-tanks were inspected on a single occasion for *A. walkerae*, but no attempt was made

to collect all the tampans present. Once approximately five tampans had been collected, sampling at that fowl house ceased. The ticks were usually collected while the birds were out foraging, but on some occasions were confined to the house by their owners. Sampling was done from midsummer to autumn (January to May) in 2004 and 2005.

Argas walkerae was collected from 102 (70.8%) of 144 fowl houses in the neighbourhood of 57 (79.2%) of the 72 selected dip-tanks (Table 1). Because of the possibility of failing to find tampans even though they were present, both at the dip-tank site and within fowl houses, a 95% confidence interval for the true prevalence of infested dip-tank sites and fowl houses was calculated (Cameron 1999). Since only two fowl houses per site were sampled, and these yielded an average prevalence of infestation of 79.2% for all localities combined, it was estimated that the sensitivity for detecting tampans at a diptank site, provided adequate numbers of fowl houses were examined, was 95%. The sensitivity for finding engorged nymphs or unfed or engorged adults in a fowl house was even lower, and was taken to be 90%. As far as we are aware there have been no previous attempts to estimate the sensitivity of sampling techniques for A. walkerae. Consequently our estimates are based solely on expert opinion taking into account the number of sites sampled and the variability of results within a site that was found in this survey. It was assumed that the ability to correctly identify a tampan was 100% (specificity). Given these assumptions, the true prevalence of A. walkerae in fowl houses belonging to communities living in the vicinity of cattle dip-tanks in the eastern part of the Eastern Cape Province is likely to be between 74 and 84%, and when tampans are present, between 64 and 75% of fowl houses will be infested.

Tampans were collected from under the bark of wooden wall poles, or roof rafters, in cracks in walls, and under nest boxes, bricks, logs and other floor debris. A total of 599 tampans in all stages of development were collected, and males constituted 44.4%

TABLE 1 Argas walkerae collected from fowl houses in the eastern regions of the Eastern Cape Province, South Africa

Localities sampled (no. infested)	Fowl houses sampled (no. infested)	Argas walkerae	
		Stage of development	No. collected
72 (57)	144 (102)	Larvae Nymphs Males Females	14 170 266 149

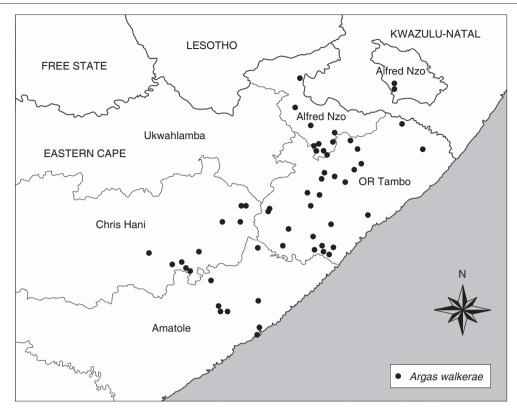


FIG. 1 The geographic distribution of cattle dip-tanks in the eastern region of the Eastern Cape Province, South Africa, in the neighbourhood of which *Argas walkerae* was collected from fowl houses

and females 24.8% of this number (Table 1). None of the larvae that were collected had fed, whereas several of the nymphs and adults were partially or fully engorged. Most *A. walkerae* were collected from houses with wood in their structure, and few or none from houses constructed only or mainly from stone or bricks.

The geographic coordinates of the dip-tanks in the vicinity of which tampans were collected were mapped (Fig. 1), and the map reveals that *A. walkerae* is present throughout the eastern region of the Eastern Cape Province. It occurs in fowl houses along the coast of the warm Indian Ocean to the high mountainous regions of the Drakensberg close to the Lesotho border, where winter snow is a frequent occurrence.

These findings together with those of Kaiser & Hoogstraal (1969), Eastwood (1971), Huchzermeyer (1972) and Norval *et al.* (1985) imply that climate does not play an important role in determining the geographic distribution of *A. walkerae*, but rather the environment. Thus the tick may be present at any locality in South Africa in which there are domestic fowls in a rural or 'backyard' setting that contains a fowl house or a roost, of which unprocessed

or partially processed wood constitutes a major component, and where there is little or no chemical control.

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