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Significant extension in northern Australia of the known geographic range of the Shield Shrimp *Triops australiensis* (Crustacea: Notostraca)

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Abstract

The program BIOCLIM predicts the total geographic distribution of species, based upon the biogeoclimatic characteristics common to the localities at which they are known to occur. Field studies in the Northern Territory have located the Shield Shrimp *Triops australiensis* at localities substantially north of its known and predicted geographic distribution.

Introduction

Williams (1968) plotted the geographic distribution of the Shield Shrimp *Triops australiensis,* demonstrating that it was confined to the arid portions of Australia, and revealing that it did not extend into the wet-dry tropics of the northern portion of the continent.

Using the program BIOCLIM, Williams & Busby (1991) undertook a biogeoclimatic review to predict the likely total geographic distribution of *T australiensis* in Australia. The review involved an analysis of the environmental and particularly climatic parameters common throughout its known distribution based on the data of Williams (1968), and addressed the issue of the apparent absence of *T australiensis* from ephemeral waters of northern Australia. These authors concluded that their analysis suggested, 'that *T australiensis* is not absent from northern Australia because it is unable to reach suitable environments there; it is absent because no suitable environments for this species apparently exist in northern Australia'.

Each year since 1974 we have undertaken a study involving the collection of aquatic invertebrate and vertebrate samples from the Kimberley Division of Western Australia, and from the northern half of the Northern Territory. Our sampling has taken place almost entirely north of the projected distribution of *T australiensis,* and has involved investigations of at least 300 sites, principally in the wet season. We have located *T australiensis* on only two occasions, and each has been at sites considerably north of the previous known distribution, and beyond the distribution predicted by Williams & Busby (1991).

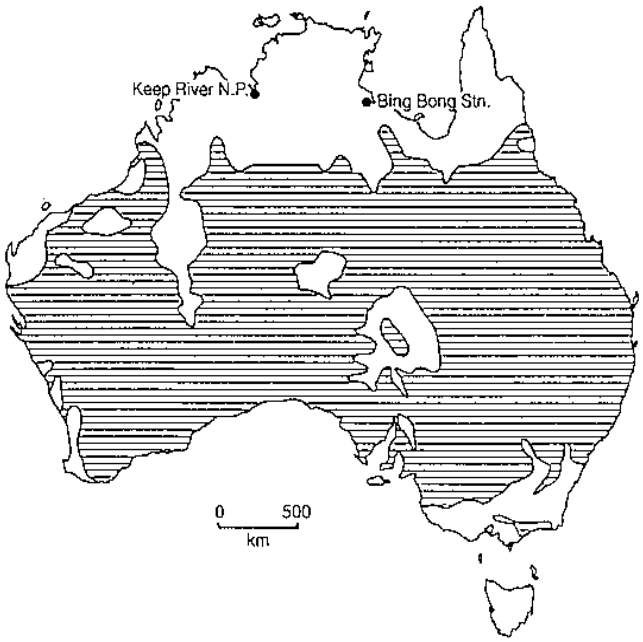

Fig. 1. Geographic range extensions for *Triops australiensis*. Solid circles = specimens collected or sighted by us. Hatching indicates actual and predicted distribution of Williams & Busby (1991).

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Fig. 2. Triops australiensis was collected in these shallow wheel ruts in Mile Creek Paddock at Bing Bong Station, N.T.

Observations

On February 8, 1986, we found *T australiensis* in a shallow, temporary pool in the Keep River National Park, adjacent to Newry Station in the extreme west of the Northern Territory. Water temperature in those pools during the day reached a maximum of 41.6 ^{0}C; when we collected the *Triops* at 8.00 p.m. it was still high but had fallen to 32 ^{0}C.

We collected extensively in the area examining 20—30 pools and undertook intensive monitoring of two ephemeral pools located to the east and reported by Watson *et al. (1995).* However, we did not locate any further specimens of *Triops*. The position of this locality is shown in Fig. 1, and the coordinates for the site are 15 0221 129 0021

Our second collection of *T australiensis* in northern Australia took place on February 9, 1989, in the Mule Creek Paddock, an open expanse of grassland on Bing Bong Station approximately 1 km south of the
station homestead, and 52 km north of the township of Borroloola, Northern Territory. There we located large numbers in shallow wheel ruts shown in Fig. 2. The water temperature at the time of collection (6.30 p.m.) was 34.4 ^{0}C. The latitude of the site is similar to that of the Keep River National Park *(15* 0381 136 0211)

Discussion

It is noteworthy that the predictive component of the BIOCLIM program used by Williams & Busby (1991) proves to be conservative. Their use of the program predicted that suitable climatic conditions existed south of Borroloola (and south of Bing Bong Station in Fig. 1); our location of the species in that area is only a slight projection further north. However, the Keep River National Park is northeast of a second extension of predicted suitable habitat by approximately 250km.

The two localities at which we encountered shield shrimps were in no way obviously different from the diversity of other sites there (and further north), at which we have failed to locate them. We do not therefore subscribe to the view of Williams & Busby (1991) that absence is attributable to the lack of suitable environments.

Acknowledgments

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References

Watson, G. F., M. Davies & M. 1. Tyler, *1995.* Observations on temporary waters in northwestern Australia. Hydrobiologia 299: 53—73.

Williams, W. D., 1968. The distribution of *Triops* and *Lepidurus* (Branchiopoda) in Australia. Crustaceana 14:119—126.

Williams, W. D. & 1. R. Busby, (1991). The geographical distribution of *Triops australiensis* (Crustacea: Notostraca) in Australia: a biogeoclimatic analysis. Hydrobiologia 212 (Dev. Hydrobiol. 64): 235—240.