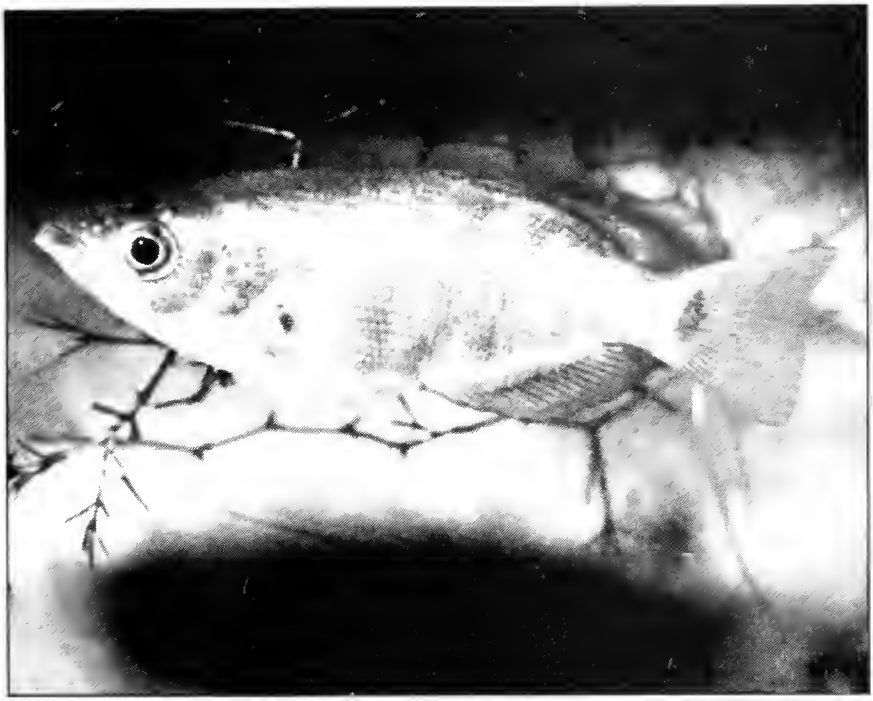
NORTHERN TERRITORY NATURALIST



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FOUNDED 1977

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Notes

If you have made a series of observations (for example, on the behaviour of a bird or other animal) or have notes on something new or unusual in the field, then this is the place to report your findings. Contributions should be in order of 200-500 words and provided with a title.

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An article should run to a maximum of about 1500 words (four to five double-spaced typed, A4 pages) and deal with a topic in the sciences. It should be written in a manner intelligible to readers without a specialist knowledge of the subject. Articles should be appropriately illustrated by clear, black ink graphs, diagrams or photographs.

Cover: Primitive Archer Fish *Toxotes lorenzi* — Photo P. Horner.

SOME NOTES ON THE OCCURRENCE OF THE GREAT REED WARBLER *Acrocephalus arundinaceus* IN THE NORTHERN TERRITORY

John L. McKean

Introduction

The eastern form of the Great Reed Warbler *Acrocephalus arundinaceus orientalis* (Temminck and Schlegel) which is sometimes accorded full specific ranking, has, according to current literature, been recorded on only one occasion in Australia, viz. a specimen collected on Melville Island, N.T. (Hartert 1924, McGill 1970, Storr 1977). This specimen is the type of *A. a. melvillensis* Mathews 1912. It is listed by Mathews (1912) as number 11,728 and is given that number in his collection register. However, the number 11,723 appears on the Mathews specimen label. It is the only *Acrocephalus* specimen collected by J. P. Rogers on Melville Island. It is now registered as AMNH 594413, sex unknown and the collecting locality is 10 miles SE of Snake Bay, Melville Island.

The breeding distribution of *A. a. orientalis* covers northern Mongolia eastwards to south-eastern Transbaikalia, Amurland, Ussuriland, Japan, Manchuria, Korea and China south to the Yangtze Valley (Williamson, 1976). Williamson (*loc. cit.*) records it as wintering over much of South-east Asia between the Philippines and Burma and as a vagrant to Germany. Vaurie (1959) includes the Malay Peninsula, Greater and Lesser Sundas to Timor and South West Islands, Celebes and Moluccas in its wintering range. *A. arundinaceus* has been recorded in the New Guinea area on at least two and probably four occasions (Le Croy 1969, Finch 1980).

Recent Northern Territory Records

On 13 March 1979, I located a Great Reed Warbler in a clump of *Avicennia* mangroves beside a small pond at the Sanderson Sewerage Ponds, Darwin, N.T. As this was an unusual date for Australian Reed Warblers, *A. australis*, to be in the area (cf. Crawford, 1972), the bird was carefully inspected and identified as a Great Reed Warbler. In my field notes I recorded the Reed Warbler, as appearing bulkier and longer than *australis* with the bill being noticeably different, appearing thick and not so elongated. I thought the area below the buff superciliary stripe was broader and darker and the flanks to be a richer chestnut but later experience showed these characters to be too variable to be of any use in distinguishing the species.

No further evidence of Great Reed Warblers in the Northern Territory was obtained until January 1982, when C. Corben, D. Robinson and others returned to Darwin from Kununurra with a tape recording of an *Acrocephalus* which they thought might be *A. arundinaceus*. I too, after gaining experience of *A. a. orientalis* recently in Asia consider the Kununurra taped call to represent *A. arundinaceus*. C. Corben kindly provided me with a copy of this tape plus a recording of the calls of the Australian Reed Warbler and I resolved to use these tapes to try and locate Great Reed Warblers locally.

Two areas, viz. Holmes Jungle Swamp and Harrison Dam, both of which were

known to have stands of Cumbungi *Typha domingensis* and *T. orientalis*, were selected for study. Small numbers of Australian Reed Warblers had been noted in both areas during dry season months over the past ten years (Crawford 1972, McKean, Thompson *et al.* unpublished). Extensive replay of Reed Warbler tapes at Holmes Jungle Swamp during January 1982 failed to elicit any response from Reed Warblers there and it was assumed that none were in the area.

H. A. F. Thompson and I visited Harrison Dam in the Humpty Doo area on 13 January 1982. Using tape recordings we lured into view one Gray's Grasshopper Warbler, *Locustella fasciolata**, three Australian Reed Warblers and one bird which we both considered to be a Great Reed Warbler. Our field description reads 'larger than Australian Reed Warbler, perhaps 1-2 cm greater in length. The bill appears deeper and not as long, and the skull flatter; head and mantle duller and the superciliary stripe distinct but not as elongated. A few striations or streakings were noted on the upper breast'.

S. B Raskin and I visited Harrison Dam on 22 January 1982. We set up two mist nets in the cumbungi beds and with the aid of the Reed Warbler tape, managed to lure one Great Reed Warbler and four Australian Reed Warblers into the nets. The Great Reed Warbler was kept for a specimen and is housed in Darwin at the Conservation Commission of the Northern Territory. A. L. Spring and I again visited the area on 11 February 1982. Using the same techniques we captured three Australian Reed Warblers and one Great Reed Warbler. The Great Reed Warbler was retained as a study skin and is to be deposited with the Queensland Museum. At Sanderson Sewerage Ponds, Darwin, N.T. on 13 March 1982 a Reed Warbler was seen skulking in mangroves *Avicennia* by John Whitaker and myself. Although the bird was not adequately seen, I identified it as a Great Reed Warbler, on the basis of its harsh grating call. J. Whitaker, A. L. Spring and I set up two mist nets at Harrison Dam on 23 March 1982, and captured two Great Reed Warblers and two Australian Reed Warblers. These birds were released after banding with CSIRO bird-rings.

The early part of the 1983 wet season was characterised by virtually no rainfall and at the end of February, Harrison Dam contained no more than 20 cm of water at its deepest point. Normal wet season rainfall commenced in March but the cumbungi in Harrison Dam was severely set back and the habitat seemed unsuitable for Reed Warblers. Tape recordings and mist nets were again utilised during four visits in January, February and April, but no Reed Warblers were recorded. Unfortunately, I did not have sufficient time to check other potential localities for Reed Warblers; however, H. A. F. Thompson located one singing bird in a small patch of cumbungi close to Leanyer Dump, Darwin on 9 January 1983. The Great Reed Warbler in this instance was identified on the basis of its call. It seems likely that Great Reed Warblers regularly visit northern Australia on an annual basis during the wet season and that their local occurrence is probably part dependent on habitat availability which is often dependent, in turn, on local rainfall.

Moult

The Great Reed Warbler specimen collected on 22 January 1982, an immature female, had the remiges moderately worn, the rectrices well worn and the body plumage in active moult. The specimen collected on 11 February 1982, an immature male, had well worn remiges and rectrices and the body plumage in active moult. Of

* *The sighting of this species which was only observed adequately by McKean will be published in a separate note in due course.*

the two birds captured on 23 March 1982, one (022-21831) had very worn secondaries and rectrices while primaries, wing coverts and body feathers were in active moult; the other (022-21834) was in active moult, everywhere, except the secondaries and secondary coverts which were old but not worn. The specimens were aged and sexed on the basis of degree of skull ossification and condition of gonads.

Measurements

Measurements in millimetres and grammes of the immature female collected on 22 January 1982 and the immature male collected on 11 February 1982, are respectively: total length 175, 164; wingspan 235, 222; wing 79, 73; tail 68, 62; weight 19.5, 18; bill, exposed culmen 16.4, 15.2; bill, from base 24.1, 21.1; bill, depth from rear of nares 4.8, 4.2; tarsus 26.8, 25.4; middle-toe 17.8, 16.8; claw 7.5, 7.2.

Subspecific Identification of Specimens

The immature female collected on 22 January 1982, on the basis of measurements, wing formula and plumage features, I consider to be an example of the race *A. a. orientalis* (Temminck and Schlegel). I cannot, however, assign the other specimen to this race. Wear on the primaries and rectrices is considerable negating the value of wing formula and wing and tail measurement as racial discriminants. However, the bird is, judging by other measurements, rather small for *orientalis*. It lacks that form's streaking on the upper breast. This, however, may be absent in heavily abraded *orientalis*. I wondered whether the specimen might not be an example of *A. a. celebensis* (Heinroth) which, according to the original description of the type is of a similar size. I have not been able to locate any other measurements of this form, and in fact, from the description, one could not be certain that Heinroth was not describing some sort of *A. australis*. If the problem specimen had not had the characteristic shaped bill of *arundinaceus* it could easily have been mistaken for *australis*. Racial determination of this specimen must await comparison with adequate series of all forms of the *Acrocephalus arundinaceus/orientalis/stentoreus/australis* complex.

Taxonomic Notes on *Acrocephalus stentoreus/australis*

Current usage in Australia (e.g. Schodde, 1975) combines *A. australis* (Gould) and its various subspecies with *A. stentoreus* Linnaeus. This is apparently based on the opinions of Hartert (1924) and Stresemann and Arnold (1949). I, like Finch (1980), feel that the evidence justifying this lumping is not strong enough. The wide hiatus in the range alone is sufficient for one to seriously consider the possibility of divergence while similarities in size could be due to convergence. In addition, the calls and song to my ear, are quite distinct. My observations on *A. stentoreus* (sens. strict.) were made at Bharatpur, India during October 1982.

Field Identification

McGill (1970) states that *orientalis* is 'not distinguishable in the field from *australis* by any noticeable plumage characteristic, but the wing is comparatively longer. With experience, it probably could be separated by the call-notes'. I concur with McGill that it would be difficult to separate the two Reed Warblers by plumage characteristics. The Great Reed Warbler is noticeably larger, not only in wing but in length and in bulk or general body size. This, however, is not readily apparent to even the most astute observer if the bird is seen without the other species available for comparison. Even then, some people would have problems.

Differences in wing formula are extremely difficult to ascertain in the field, particularly with a skulking species such as the Great Reed Warbler out of breeding season. Moreover, the wing formula of the Australian Reed Warbler is fairly variable (Mayr, 1948), while Great Reed Warblers could be expected to have their wing feathers heavily abraded or in active moult during much of their wintering period in northern Australia.

Pizzey (1980) states that the inside of the mouth of *orientalis* is salmon while that of *australis* is yellow. I found the inside of the mouth of both Reed Warblers to be indistinguishable and somewhere near salmon in shade. Comparison of *australis* and *orientalis* in the hand showed the irides of *orientalis* to be a deeper brown. I have not been able to pick this difference in the field but it might be possible under extremely favourable viewing conditions. Another in hand difference noted that may have limited use in the field is that the exposed culmen ridge penetrates deeper into the frontal feathers (i.e. is exposed much further past the nares) in *australis* than in *orientalis*.

Our experience indicates that Great Reed Warblers rarely sing in northern Australia but the song is none-the-less quite distinctive being lower in pitch and having a much more guttural quality than that of Australian Reed Warblers. With practice even the contact and alarm calls may be distinguished. Despite the differences in song and calls Great Reed Warblers will respond to tapes of Australian Reed Warblers and vice versa.

By far the most useful field character that I have found to be reliable, is the length and depth of the bill in relation to the length of the crown or as judged from the position of the eye in the head. Great Reed Warblers give the impression of having a thicker and shorter bill than that of Australian Reed Warblers. Figure 1 shows a Great Reed Warbler illustrating the size and shape of the bill in comparison with the rest of the body, while Figure 2 compares the head and bills of Great (upper) and Australian (lower) Reed Warblers. The actual length of Australian Reed Warblers' bills, however, overlaps that of the Great Reed Warbler and it is mainly due to it being more slender that the impression of a longer bill is achieved.

My conclusions concerning bill shape were gained prior to the reported sightings and resulted from studying and comparing many photographs of *A. arundinaceus* (mainly of the nominate race) and *A. australis*. Later, during 1982 I was able to observe many hundreds of *A. arundinaceus* in Asia and confirm that the bill of the eastern form *orientalis* also appeared thicker and shorter than that of *australis*. No comments are made on the relative usefulness of tail shape (c.f. Williamson, 1976) in identification as most of the *orientalis* that I have seen or handled in Australia have had heavily abraded tails.

Acknowledgements

H. A. F. Thompson, J. Whitaker, A. L. Spring and S. B. Raskin assisted in the field. I am grateful to Mary Le Croy for information on the Melville Island specimen and to Chris Corben for providing the *Acrocephalus* tapes. A number of the useful critical comments made on the manuscript by D. Robinson and C. Corben have been utilised in the text.

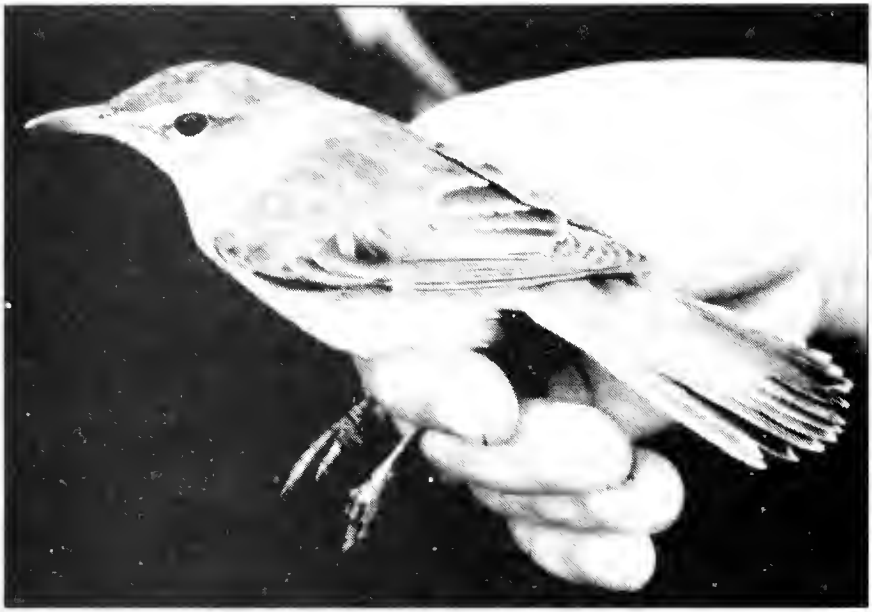


Fig. I: Great Reed Warbler captured at Harrison Dam, Humpty Doo area, N.T. January 22, 1982. Photo Keith Martin.

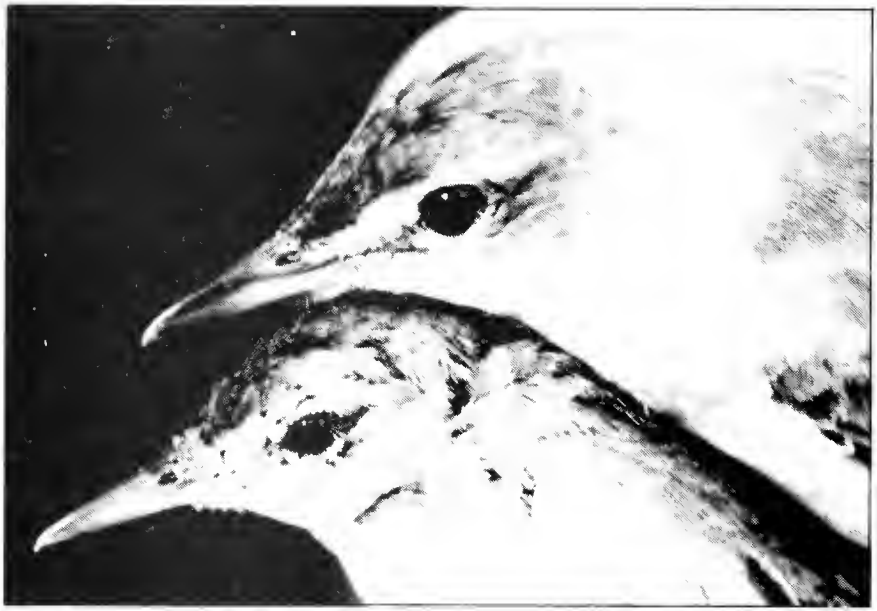


Fig. II: Comparative study of head and bill profiles of Great Reed Warbler (above) and Australian Reed Warbler (below). Harrison Dam, January 22, 1982. Photo Keith Martin.

Summary

Recent occurrences of the Great Reed Warbler *Acrocephalus arundinaceus* in the Northern Territory are documented. The species is probably a regular wet season visitor in small numbers that has been previously overlooked because of its secretive nature, and the problems of distinguishing it in the field. Most of the birds visiting the Australasian region probably belong to the race *orientalis* but it was not possible to positively identity one specimen to race. Some notes on the nomenclature used for the Australian Reed Warbler are given and criteria for distinguishing the two Reed Warblers is discussed.

References

CRAWFORD, D. N. (1972) Birds of the Darwin area, with some records from other parts of the Northern Territory. *Emu* 72:131-148.

FINCH, B. W. (1980) First Papua New Guinean Record of the Great Reed Warbler *Acrocephalus arundinaceus orientalis* at Aroa Lagoon, Central Province. *Pap. N.G. Bird Soc. Newsl.* 163/164:16-20.

HARTERT, E. (1924) 'Ueber Einige Neue Voegel aus dem Indo-Australischen Archipel und deren Vorwandt'. *Treubia* 6:20-25.

LE CROY, M (1969) *Acrocephalus arundinaceus orientalis*, first record in New Guinea. *Emu* 69:119-120.

MATHEWS, G.M. (1912) Additions and corrections to my reference list to the birds of Australia. *Austral Av. Rec.* 1:73-80.

MAYR, E. (1948) Geographic Variation in the Reed Warbler. *Emu* 47:205-210.

McGILL, A. R (1970) *Australian Warblers*. Bird Observers Club: Melbourne 147 pp.

PIZZEY, G. (1980) *A field guide to the birds of Australia*. Collins: Sydney 460 pp.

SCHODDE, R. (1975) *Interim List of Australian Songbirds. Passerines*. R.A.O.U.:Melbourne.

STORR, G. M. (1977) Birds of the Northern Territory. *Spec. Publs. West Aust. Mus.* 7:1-130.

STRESEMANN, E. and ARNOLD, J. (1949) Speciation in the group of Great Reed Warblers. *J. Bombay Nat. Hist. Soc.* 48:428-443.

VAURIE, C. (1959) *Birds of the Palearctic Fauna, Order Passeriformes*. Witherby: London 762 pp.

WILLIAMSON, K. (1976) *Identification for Ringers I. The genera Cettia, Locustella, Acrocephalus and Hippolais*. B.T.O. Tring. 3rd Rev. Ed. 79 pp.

John L. McKean
Wildlife Research Section
Conservation Commission of the Northern Territory
P.O. Box 38496
WINNELLIE, N.T. 5789

ARCHERFISHES IN THE NORTHERN TERRITORY

Keith Martin

Introduction

The Archerfishes (family *Toxotidae*) are a small group of Perciform fishes which inhabit the mangrove estuaries and freshwater streams of South East Asia and nearby regions. The genus *Toxotes* contains all six of the currently recognised species, the distributions of which are summarised below (Allen, 1978).

Toxotes blythi — Burma.

Toxotes chatereus — Widespread throughout S.E. Asia, including India, Malaysia, Thailand, Vietnam, Singapore, Sumatra, Borneo, New Guinea, and Northern Australia.

Toxotes jaculator — S.E. Asia and Indonesia generally, also Philippines, New Guinea, and several South Pacific islands. Although reported from Darwin and N.W. Australia, the only reliable Australian records appear to come from northern coastal Queensland.

Toxotes lorenzi — Irian Jaya and Northern Territory, Australia.

Toxotes microlepis — Thailand, Sumatra, Borneo.

Toxotes oligolepis — Mollucca Islands, Irian Jaya, and Western Australia (Kimberleys).

This article deals with two species (*T. chatereus* and *T. lorenzi*) which occur in the Northern Territory. Information is provided on the distribution, habitat, and behaviour of these fishes, including a new locality record for *T. lorenzi*.

General

The Archerfishes, or Riflefishes as they are sometimes known, are famous for their peculiar habit of securing food. When a prey item is spotted above the water, such as an insect flying overhead or resting on a reed, the fish rises to the surface and "shoots" it down by forceably ejecting a pellet of water from the mouth. The prey is then seized at the water surface and eaten.

To accomplish this amazing feat the archerfish has a specially adapted palate with a deep longitudinal groove. When the gill covers are suddenly compressed, water is forced from the pharynx into this canal under pressure, to be shot out of the mouth. The tongue is pressed against the palate during this operation and acts as a regulatory valve (Smith, 1945). Using this technique, the fish can accurately hit its prey from a distance of over a metre.

The habit of shooting water to secure prey appears to be confined to fishes of the family *Toxotidae*. Several old references, however, credit the long nosed butterfly fishes of the genus *Chelmon* (a group of marine Chaetodontids) with the same ability, but lack of any recent evidence seems to refute this claim. These fishes inhabit coral reefs, and the long snout is an adaptation for reaching food in narrow crevices and holes, rather than for shooting water.

Four species of archerfishes occur in tropical Australia. *Toxotes jaculator* and *T. oligolepis* are yet to be reliably recorded in the Northern Territory. Although they may well occur here, they are not discussed in this article. The remaining two species, *T. chatereus* and *T. lorenzi* may be readily distinguished by a number of morphological features, which are compared below:

Toxotes chatereus	*Toxotes lorenzi*
Dusky grey colour, with 6 or 7 black spots on the upper side of the body. Soft dorsal, caudal and anal fins sometimes black.	Pale brown, all fins greyish. Several faint darker bands on body.
Lateral line curved anteriorly.	Lateral line nearly straight.
Large body scales.	Small body scales.
Body and fins flared posteriorly.	Body streamlined.

***Toxotes chatereus* (Hamilton)**

This ubiquitous archerfish attains a standard length of up to 400 mm. Much variation in colour and pattern exists throughout its large range. In some specimens, the body spots are extended into vertical bands whilst in others, they are greatly reduced. Specimens from the inland streams and rockholes of the N.T. have a great deal of black on the dorsal and posterior parts of the body and fins, and look quite different from the more coastal forms. Juveniles exhibit a distinctive white spot on the anterior dorsal surface.

This species occurs in mangrove fringed estuaries along the entire N.T. coastline, penetrating far inland in all the major rivers and freshwater streams. Allen (1978) records its presence up to 200 km inland in the Roper, Edith, and King rivers.

It is a surface swimmer, and is usually seen cruising about the mangrove or pandanus fringes of our waterways. Due to its surface dwelling habit, this is a very obvious fish to even the casual observer, and visitors to places such as Berry Springs and Katherine Gorge spend countless hours watching and feeding these interesting fishes.

Despite its small size, it is regarded as a fine food fish, and can be readily caught on a lure. Live grasshoppers are, however, a sure fire bait when angling for this species.

***Toxotes lorenzi* Weber**

This fish has been commonly referred to as the "primitive" archerfish, and was placed in a separate genus *(Protoxotes)* by Weber and de Beaufort (1936) because of its apparently primitive morphology (lack of distinctive markings, small scale size, straight lateral line, and streamlined body). However, there is really little scientific evidence to support this theory and Taylor (1964) relocated it to the genus *Toxotes*. Its present distribution, however, could indicate that of relict populations.

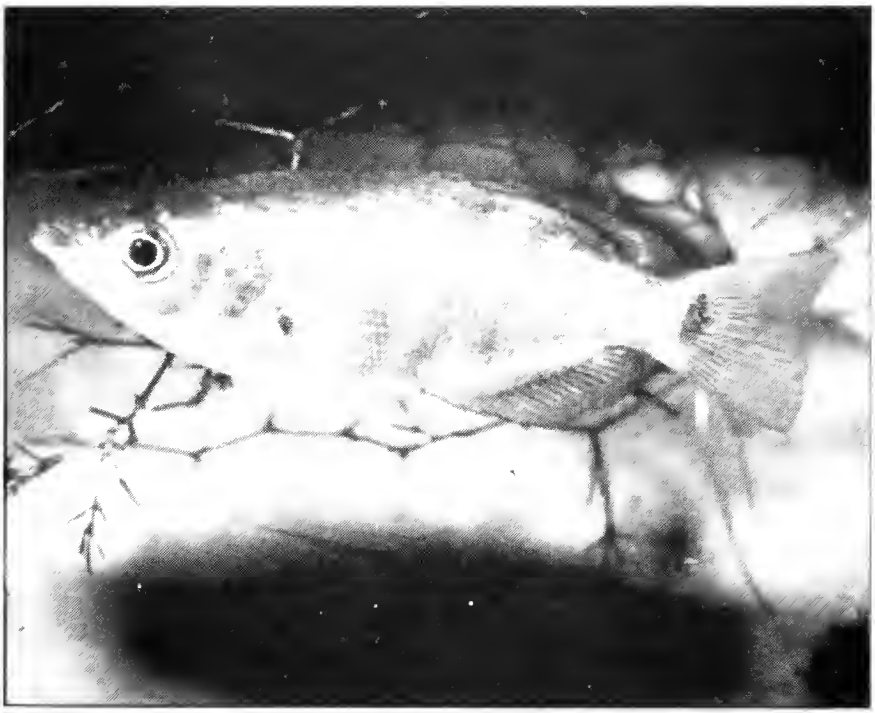
This species is probably the most poorly known of the genus. Described in 1911 from "a freshwater pool near Merauke, South New Guinea" (Weber, 1911), it is known in Irian Jaya only from the Merauke River, and in the vicinity of Balimo.

Its presence in Australia was first reported in 1950 (Whitley, 1950) from Yam Creek, a tributary of the upper Adelaide River, N.T. During the Alligator Rivers Fact

Finding Study of 1973, it was collected from three localities in the South Alligator River drainage system — Sawcut Gorge, Deaf Adder Gorge, and Baroalba Springs (Pollard, 1974). These are all clear, upland rockpools at the base of the Arnhem Land and escarpment, which were found to contain a number of other highly localised fish species. The species has also been collected in Long Harry's Billabong, downstream of Sawcut Gorge in Nourlangie Creek (F. Hubbard, pers comm).

Recently, several Darwin aquarists brought to my attention the occurence of *T. lorenzi* in Scotch Creek, a tributary of the lower Adelaide River. My wife and I decided to investigate these reports, and on 25/4/81 we located a population of *T. lorenzi* in Scotch Creek just below the Woolner Road crossing, where we managed to collect a living specimen.

This locality is a vastly different habitat to that of the South Alligator sites, all of which are isolated, sheltered upland rockpools of clear, permanent water. They are little affected by seasonal changes. On the other hand, the Scotch Creek site is virtually on the Adelaide River floodplain. It is open, muddy, and severely affected by seasonal flooding and drying out. That this fish can tolerate these apparently extreme habitat variations is an indication that the species may have previously had a much larger range in Australia.



Primitive Archer Fish — Photo P. Horner.

Behaviour

The following information is summarised from the author's unpublished research (Martin, 1981) and other personal observations.

Under experimental conditions, both species of N.T. archerfishes exhibit very similar behavioural patterns. These fishes spend a large proportion (63% in *chatereus*, 79% in *lorenzi*) of their daylight activities engaged in cruising on the water surface at a depth of less than three centimetres.

Other activity units are generally associated with securing food. Most food is captured at or near the surface, and is generally comprised of insects such as grasshoppers, dragonflies, ants and flies. However, occasional forays are made at depth, where the fishes prey on crustaceans and other invertebrates, particularly young prawns *(Macrobrachia spp)*.

The habit of firing pellets of water to knock down insects has been described briefly in the introduction, and in detail in Smith (1945). To effect a shot, the fish tries to approach its prey as closely as possible, and ideally, directly below the prey item. The fish has very little flexibility in its mouth parts so to line up a potential target, it must alter its body angle, or "trim", in the water for accurate shooting.

There are two very distinct methods employed in shooting prey:

1. The "Power Shot" is usually a long range shot, intended to knock prey into the water. It is accompanied by an audible sound of water expulsion. This shot is used when the fish is certain that a prey item is present, and intends to capture it.

2. The "Washing Shot" is used where the suspected prey item is close enough to the water's edge that it can be "washed" into the water by a succession of light, fanning sprays. This shot is also used to test if a particular search image is, in fact, a prey item.

   The washing shot is therefore something of an exploratory shot, and if there is no movement in the suspected prey item, the fish will lose interest and depart.

Archerfishes also use another quite spectacular method of securing prey. From a standing start near the surface, the fish orients its body so that the head is pointing towards the prey and the tail is dipped such that the fish is "standing on its tail" just below the water surface. With a rapid flick of the body, the fish jumps out of the water to capture a prey item overhead. The fish then side-flops back into the water, where the prey is eaten.

On one occasion, a *T. lorenzi* was observed to leap 60 cm from the water to capture a dragonfly. Prey items which are large, such as this, are probably difficult to catch using the water shooting technique, so the fish leaps. It was also noted that by using this method, the fishes were also able to capture insects on the wing, a feat which would be very difficult to achieve by water shooting. Using a variation on technique, archerfishes are also able to capture prey which were close to the water's edge, and could not be shot down. The fish will actually beach itself, grab the prey, then flick back into the water.

The "Leaping Capture" appears to have a high success rate for capturing food compared with the shooting techniques. Strangely, it does not seem to have been recorded in the literature previously.

H. K. Larson (pers comm) informs me that during field studies at Victoria River, N.T., archerfishes were frequently found caught in gill nets which were raised about one metre above the water when not in use. The fishes presumably leapt into the nets when attempting to capture insects which had landed there.

Conclusion

Toxotes chatereus is a common fish throughout its range and is of no economic importance. Therefore, its continued existence in the N.T. would seem to be assured. *Toxotes lorenzi*, however, due to its very restricted known range, must be regarded as a potentially endangered species. Fortunately, its major distribution falls well within the Kakadu National Park, and its survival in this area would seem to be safe.

The Scotch Creek population has no such guarantee. This area is an example of the Top End's coastal wetland habitat and as such, it is a haven for many kinds of wildlife. However, the recent construction of a badly engineered culvert on the Woolner road at Scotch Creek has caused havoc with the freshwater environment. Countless thousands of native fishes (and other freshwater wildlife) died there in the early dry season of 1981 whilst attempting to negotiate the culvert and reach the permanent freshwater billabongs upstream. Unless this situation is rectified, the Scotch Creek population of *T. lorenzi* (along with numerous other freshwater animals) is threatened.

Archerfishes are easily kept in the home aquarium, and make fascinating subjects for the garden pond. In captivity they will accept normal fish foods, but generally prefer live insects. They are quite tolerant of other fish species in the same aquarium, and will live for many years with little maintenance.

References

ALLEN, G. R. (1978) A review of the Archerfishes (family *Toxotidae*). Rec. West. Aust. Mus. 6:4.

MARTIN, K. (1981) Behavioural aspects of the Archerfishes, *Toxotes chatereus* (Hamilton) and *Toxotes lorenzi* Weber (Pisces: Toxotidae). Animal Behaviour Project, Darwin Comm. College. (unpubl.)

POLLARD, D. A. (1974) The freshwater fishes of the Alligator Rivers "Uranium Province" area (Top End, Northern Territory) with particular reference to the Magela Creek catchment (East Alligator River system). Aust. Atomic Energy Comm. Rep E305.

SMITH, H. M. (1936) The Archer Fish. Nat. Hist. 38:3-11.

TAYLOR, W. R. (1964) Fishes of Arnhem Land. In: "Records of the American-Australian Scientific Expedition to Arnhem Land" ed. R. L. Specht 4:45-307. Melbourne Univ. Press.

WEBER, M. & de BEAUFORT, L. F. (1936) The fishes of the Indo-Australian archipelago. Leidon: E. J. Brill. 7.

WHITLEY, G. P. (1950) Studies in Ichthyology. No 14. Rec. Aust. Mus. 22:234-245.

SUBSPECIFIC IDENTIFICATION OF AN AUSTRALIAN SPECIMEN OF THE LITTLE RINGED PLOVER *(Charadrius dubius)*

John L. McKean* and Hilary A. F. Thompson**

The Little Ringed Plover, *Charadrius dubius*, is probably a regular visitor, though in small numbers, to northern Australia. Since last reviewing our Darwin records (McKean and Hertog, 1981) a number of further sightings have been made at the Sanderson Sewerage Ponds and on Leanyer Swamp. At least three birds were present during the 1981/82 season. One of these could be readily identified from the other two on account of its more advanced plumage. This bird was first noted on 23 January 1982 and by 13 February 1982 had donned what appeared to be full nuptial plumage.

At 0700 hours on the morning of 3 March 1981, one of us (H.A.F.T.) found the nuptial plumaged Little Ringed Plover dead on a road running through the sewerage pond area. Rigor mortis had not set in and it was surmised to have been hit by a motor vehicle the previous night. Although no bones were broken, copious internal bleeding had occurred. The bird was prepared as a study skin and is apparently the first specimen taken in Australia. Racial determination of *Charadrius dubius* visiting Australia has thus not been possible until now although it has been predicted (McKean et al., 1975, R.A.O.U. Checklist Amendment Committee 1978) that the form to do so would be *C. d. curonicus*.

Colouration of the soft parts at the time of discovery were: iris, brown; eye skin, bright yellow; bill, black with the first 5 mm of the lower mandible yellow; tarsus and toes, yellowish flesh, claws, grey. The specimen was a male with testes measuring 1.5 x 1.0 mm and 2.3 x 0.9 mm. It was considered to be in its first summer plumage as the skull was not fully ossified. Wing, tail and body moult were complete except for some new feathers appearing on the head. The subcutaneous and peritoneal fat deposits were extremely heavy. Measurements were: total length, 168 mm; wing span, 360 mm; weight, 48 gm; bill, exposed, 14.2 mm; bill, total, 18.8 mm; wing, 116 mm; tail, 62 mm; tarsus, 25.1 mm, mid toe, 16.3 mm; claw 4.6 mm.

Three subspecies are generally recognised (Johnsgard, 1981). *C. d. curonicus* breeds in Eurasia from Scandinavia east through Russia and Siberia to the Sea of Okhotsk and perhaps Sakhalin, and south to the Mediterranean and northern Africa, Asia Minor, central Asia, Mongolia, China and Japan. It winters south to Sri Lanka, the Malay Peninsula, the Sundas and on one occasion to New Guinea (Japen Island). *C. d. jerdoni* is resident throughout the Indian subcontinent from Sind through Burma, the Malay Peninsula and southern China, and south to Sumatra and Borneo. Ali and Ripley (1980) state that *jerdoni* differs from *curonicus* in being slightly smaller. However, *jerdoni* differs considerably from *curonicus* in its moult patter. The latter has a juvenile-like winter plumage, whereas *jerdoni* lacks a winter plumage. They consider that in India all examples with wing over 114 mm, especially non-breeding birds collected in the plains in winter are probably referable to *curonicus*. *C. d. dubius* (includes *papuanus*) is resident in the Philippines, New Guinea and New Ireland. It differs from *curonicus* in its much smaller size with wing

length ranging from 105 to 110 mm (Rand and Gilliard, 1967, du Pont 1971). The nominate form has little or no black in outer tail feathers, whereas *curonicus* has a distinct black bar on the outer tail feathers.

On the basis of size and the presence of a distinct black bar on the outer tail feathers, the specimen is referred to the form *curonicus*. The occurrence in Australia of the migratory form *curonicus* rather than one of the non-migratory forms *dubius* and *jerdoni* is not surprising.

References

ALI SA'LIM AND RIPLEY, S. DILLON (1980) *Handbook of the Birds of India and Pakistan together with those of Bangladesh, Nepal, Bhutan and Sri Lanka.* Vol. 2. 2nd Ed., Oxford Univ. Press: London. 347 pp.

DU PONT, JOHN ELEUTHERE (1971) *Philippine Birds.* Delaware Mus. Nat. Hist.: Delaware. 480 pp.

JOHNSGARD, PAUL A. (1981) *The Plovers, Sandpipers, and Snipes of the World.* University of Nebraska: Lincoln. 494 pp.

McKEAN, JOHN L. AND HERTOG, A. L. (1981) 'Some further records of uncommon migrant waders near Darwin, N.T.' *N.T. Nat.*, 4:10-13.

McKEAN, J. L., MASON, I. J. AND O'CONNOR, L. W. (1975) 'Birds not previously recorded from Timor'. *Emu*, 75:62-64.

RAND, AUSTIN L. AND GILLARD, E. THOMAS (1967) *Handbook of New Guinea Birds.* Weidenfield and Nicolson: London. 612 pp.

R.A.O.U. Checklist Amendment Committee (1978) 'Second Amendments to the 1975 R.A.O.U. Checklist'. *Emu*, 78:80-87.

* Conservation Commission of the Northern Territory, P.O. Box 38496 Winnellie, N.T. 5789.

** G.P.O. Box 5385, Darwin, N.T. 5794.

EFFECTS OF A BITE FROM A BARKING SPIDER *(Selenocosmia stirlingi)* Hoog

Geoffrey Robinson* and Graham Griffin**

The paucity of information concerning manifestations of spider invenomation in humans can often hinder the application of appropriate medical treatment. This situation is particularly serious in sparsely settled regions where access to assistance can often be delayed by travel time to medical centres.

In central Australia there are few species of spider capable of inflicting serious and prolonged discomfort in humans. Of these the Redback Spider, *Latrodectus hasselti*, Mouse Spider *Missuleana* sp. and the Bird or Barking Spider, *Selenocosmia stirlingi* are considered the most dangerous.

Effects of a bite

The following describes the clinial manifestations exhibited by a 35-year-old woman thought to have been bitten by a spider and admitted to Alice Springs Hospital four days after the bite. The bite was inflicted on the thigh while the woman was asleep. A spider was recovered from the bed clothes the next morning and was subsequently identified as a mature male Barking Spider.

The woman initially felt an itch at the bite location. Next morning the bitten area began to sting and appeared as a pink circular area about 3 cm in diameter, with two puncture marks approximately 1 cm apart within it. Over the next two hours the bite caused intense discomfort, similar to a 'wasp sting', and the area of redness increased.

Antihistamines, aspirin and codeine were taken to alleviate the pain, however the inflamed area surrounding the bite continued to increase. By nightfall the area was circular in shape, about 6 cm in diameter, red and felt 'very hot and burning'. The woman experienced nausea but no vomiting and developed a 'splitting headache behind the eyes', which was exacerbated by light. During the next three nights she also had frequency and dysuria.

The nausea and headache continued less intensely into the third day and the erythematous area was fading, but in the evening the headache became very severe, aggravated by the slightest light. The woman had a rigor, felt very nauseated and vomited. The bitten area again became hot, red and 'angry looking'. It became slightly vesiculated on the margins, and began to spread rapidly and irregularly over the thigh. By the morning of the fourth day the plague-like lesion covered almost two-thirds of the thigh surface area. She was admitted to hospital on the fourth day without any systemic symptoms or fever, and was not distressed. The lesion was tender but not hot. The following observations were made:

— Regional lymph nodes not enlarged or tender;
— Urine contained no protein;
— Erythrocyte Sedimentation Rate was 60 mm/h;
— Blood count and film, serum electrolytes, serum urea and creatinine, liver function tests, microscopic examination of urine and fibrinogen degradation products in the blood were all within normal limits;
— No growth on culture of the urine.

The patient remained symptom-free over the next four days and the skin lesion gradually faded.

The spider

The Barking Spider is a terrestial burrower common in inland Australia. Its body (head and thorax) measure about 4-5 cm in mature specimens. In central Australia the spider is most active during, and for several days following, summer rains. Males of the species are most commonly encountered since they vacate their burrows during humid weather in search of the more sedentary females. The males do not return to their burrows but remain as vagrants until death. It is during this period they are most likely to come into direct contact with people.

Southcott (1978) reports that bites from species of *Selenocosmia* can sometimes cause 'severe reactions'. A bite from a closely related larger species *(S. crassipes)* near Darwin, was reported to have killed a 4.5 kg dog within two and a half hours (C. S. Li, pers comm).

Reference

SOUTHCOTT, R. V. (1978) Australian harmful Arachnids and their allies. R. V. Southcott, 2 Taylors Road, Mitcham, South Australia 5062.

* Alice Springs Hospital, Alice Springs, N.T. 5750.
** C.S.I.R.O. Central Australian Laboratory, Alice Springs, N.T. 5750.

A NEW RECORD FOR THE NORTHERN TERRITORY OF THE THICK-TAILED GECKO *(Underwoodisaurus milii)*

B. W. Strong* and M. W. Gillam**

Counts of European rabbits *(Oryctolagus cuniculus)* are undertaken bi-monthly in an experimental area located on Owen Springs Station, 35 kilometres south-west of Alice Springs, Northern Territory. As an adjunct to this work, sightings of feral cats *(Felis catus)* are noted and where possible specimens are shot and their stomach contents recorded.

On the night of 4 August, 1982, an adult male cat was shot as it emerged from a rabbit warren (23° 53′ S, 133° 33′ E). Examination of its stomach contents revealed the following prey items:

— *Underwoodisaurus milii* (immature, snout-vent length 45 mm)
— *Amphibolurus nuchalis* (part of adult)
— *Mus musculus* (two adults)
— *Oryctolagus cuniculus* (foot and fur)
— Grasshopper (unidentified)

The cat was taken from an open calcareous plain with sparse witchetty bush *(Acacia kempeana)* in the upper storey and short annual grasses and forbs in the under storey. Immediately to the south are large areas of sandy red earths dominated by Mulga *(Acacia aneura)*. The two Land Systems, Muller and Ewaninga, are described by Perry et. al. (1962).

The *U. milii* is the first record of the species from the Northern Territory and is lodged with the Central Australian Museum in Alice Springs (NTM-A/S R979).

The Map shows the location of the new record in relation to the previous known distribution of *U. milii* (after Cogger 1979).

References

COGGER, H. G. (1979) Reptiles and Amphibians of Australia, Reed, Sydney.

PERRY, R. A. et. al. (1962) Lands of the Alice Springs Area, Northern Territory, 1956-57. Land Research Series No. 6, CSIRO, Melbourne.

* c/o Conservation Commission of the Northern Territory
P.O. Box 1046,
ALICE SPRINGS, N.T.

** 11 Gardenia Court,
ALICE SPRINGS, N.T.

Map. Distribution of *Underwoodisaurus milii*. (after Cogger 1979)

* Location of new record.

A SHORT NOTE ON THE DISTRIBUTION OF THE FOX *(Vulpes vulpes)* IN THE SOUTHERN NORTHERN TERRITORY

B.W. Strong and W.A. Low

During the course of a three year study to determine the distribution and biology of the European rabbit in the Northern Territory we noted the location, date and time of sightings of foxes. The fox is considered to be a natural predator of the rabbit and we were interested in any possible controlling influence they might have on the rabbit population. Time did not permit a detailed study and we present here a map showing the general areas of our sightings and some of our observations.

The map shows the location of our sightings in the period March 1981-March 1983. During that period we covered a large proportion of the accessible areas encompassed by the map. Table 1 lists our major study sites and the number of sightings in each. We occasionally saw pairs of foxes, in one case three, and on three occasions we recorded six or more foxes for each visit. All the sightings were located in rabbit infested areas and the most common habitat was open low woodland or sparse tall shrubland on flat to undulating limestone plains. The almost total absence of foxes on the Mt. Cavanagh study site could have been due to rabbit shooters operating in the area or to unsuitable habitat. All of our night work was done in rabbit areas and we do not have any observations on foxes outside these areas. Over 80% of the sightings were below latitude 25°N where rabbit infestation is at its worst. There is probably a strong correlation in distribution of foxes and rabbits but a more intensive study is required to confirm this.

The most northerly records we have are on Newhaven and Mt. Wedge Stations. This is the only area north of the MacDonnell Ranges where our work was intensive. Ten other nights spent north of the ranges on stations ranging from Stirling to Mt. Riddock yielded only one sighting. As Table 1 shows we saw no foxes on Ambalindum and The Garden Stations which were located in the eastern MacDonnells and our study sites there are heavily infested with rabbits. Presumably the country north of the ranges is not suitable habitat due to climatic limitations or lack of suitable food.

A summary of the hour of sightings is given in Figure 1. Only one sighting at 0930, was outside the period 1700 to 0100 hours. Our observation time was mostly between 0800 hours and midnight so we cannot make any comment on fox movements during the early morning. The evidence confirms a strong nocturnal behaviour. Our data does not show any clear seasonal trend in sightings. Foxes were seen in all months of the year except February, October and November, and more frequent sightings were in March, June, July and December.

There is a large gap in our knowledge of the distribution and biology of the fox in the Northern Territory. The limit of its distribution and the factors causing this limit are unknown. We have suggested that there is a strong dependence of foxes on rabbits but at the same time we have presented some evidence that foxes do not appear to inhabit some rabbit areas. We have no knowledge of their diet in the Northern Territory, although it is highly likely that rabbit is the principal item of food. We do not know anything of their diet outside these areas, or if in faet foxes survive there.

Table 1: STUDY SITES AND FOX SIGHTINGS IN THE SOUTHERN NORTHERN TERRITORY

Study Area	Latitude of Study Area	No. of Nights of Observations	No. of Foxes	Major Habitat Type where Foxes observed
Newhaven/ Mt. Wedge	22° 55′	13	4	Open Sandy limestone plain
The Garden/ Ambalindum	23° 20′	15	0	Terraees and plains bordering the Hale River
Owen Springs	23° 50′	37	4	Open and undulating limestone and alluvial plain bordering the Hugh River
Idraeowra	25° 05′	9	17	Open undulating stony plains with intrusions of ealerete and sand-dunes
Erldunda	25° 25′	8	32	Sandy limestone plain
Mt. Cavanagh	26° 00′	6	1	Granite hills and plains

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