

V REPTILES AND FROGS OF BADJALING NATURE RESERVE,
SOUTH BADJALING NATURE RESERVE, YOTING TOWN
RESERVE AND YOTING WATER RESERVE

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Reptiles and frogs were collected on Badjaling Nature Reserve (BNR), South Badjaling Nature Reserve (SBR), Yoting Town Reserve (YR) and Yoting Water Reserve (YWR) between 11-18 November 1974 and 5-11 May 1975. Collecting methods included shooting active reptiles with 0.22 calibre dust shot, searching litter, logs, rubbish and roadside spoil, and digging out burrows. In addition, searching at night with head torches was carried out. All specimens are in the Western Australian Museum with registered numbers R49174-49187, R52390-52435, R52440-52486, R52489-52515 and R52206-52252.

All specimens were dissected, sexed, their reproductive organs examined, and gonads and snout-vent lengths (SVL) measured. Clutch sizes are referred to as, for example, 2, 1 eggs. This means two eggs were in the left and one in the right oviduct. Stomach contents were collected and identified where possible. Appendix 1 indicates species present, number collected with vegetation location numbers (where known) which are directly referable to Muir (this publication). Where we cannot allocate a specimen to a particular formation, we quote the collector's field label directly. The annotated list is compiled from data from all 4 reserves. Number in brackets refers to number of specimens collected each season.

Annotated List

LEPTODACTYLIDAE

Heleioporus albopunctatus BNR, SBR, YR, YWR (November — 12, May — 7). Headtorching at night in Salmon Gum (*Eucalyptus salmonophloia*)/Gimlet (*E. salubris*) woodland on sandy clay, in Wandoo (*E. wandoo*) woodland on clay loam, in Jam (*Acacia acuminata*) and *Banksia prionotes* woodlands on fine sandy loam. Males calling in May.

Heleioporus sp. BNR, YWR (3 specimens — November). Headtorching at night, in the open in woodland on sandy clay and in shrubland. Probably juveniles (recently metamorphosed) and sub-adult *H. albopunctatus*.

Limnodynastes dorsalis SBR (1 specimen — May). In water in well, adjacent to woodland on fine sandy loam.

Myobatrachus gouldii SBR (2 specimens — May). In water in well, adjacent to woodland on fine sandy loam.

Neobatrachus centralis YWR (7 specimens — May). Headtorching at night in Salmon Gum/Gimlet woodland on heavy clay.

Neobatrachus pelobatoides BNR, SBR, YR, YWR (22 specimens — May). Headtorching at night in Salmon Gum/Gimlet woodland on heavy clay, in *Banksia prionotes/Xylomelum angustifolium* woodland on fine sandy loam, in Jam woodland on fine sandy loam and in Wandoo woodland on clay loam.

Neobatrachus spp. BNR, SBR, YR (November — 6, May — 2). Probably 2 taxa involved, those with head vent lengths 24-38 mm tentatively identified as *N. sutor*, those with 46-53 mm as *N. centralis*.

Pseudophryne guentheri BNR, YR, YWR (November — 2, May — 10). Headtorching at night, and in pit traps and under tyres, tin, etc. in rubbish. In Salmon Gum/Gimlet woodland on sandy clay, in heath on sandy loam and in shrubland on sandy loam. Males calling in November and May.

GEKKONIDAE

Crenadactylus ocellatus BNR, YWR (November — 4, May — 1; 3 ♀♀, 2 juveniles). Cryptozoic. In rubbish tip under sheet of tin in Salmon Gum woodland on sandy clay, under spoil in *Eucalyptus gracilis* woodland too small to be mapped, within loc. 3.1 and 'on a yellow sandplain under litter'. One November female (SVL 31 mm) had 1, 1 oviducal eggs (9 x 5 mm x 9 x 4 mm), another November female (SVL 32 mm) had 1, 1 yolky follicles *ca* 2.0 mm diameter, with 3, 1 smaller follicles < 1.0 mm diameter.

Diplodactylus granariensis YWR (November — 8, May — 2; 4 ♀♀, 4 ♂♂, 2 juveniles). Headtorching at night, on ground in Salmon Gum woodland on sandy clay. Two November females (SVL 51, 54 mm) had 1, 1 yolky follicles in ovaries (4-7 mm in diameter) and other smaller follicles. Juveniles (SVL 29, 33 mm) collected in November and May.

Diplodactylus maini BNR, YR, YWR (November — 15, May — 12; 15 ♀♀, 10 ♂♂, 2 juveniles). Headtorching at night, on ground and in spider burrow in Salmon Gum woodland, and in Jam woodland. Four November females (SVL 46-51 mm) each had 1, 1 oviducal eggs (*ca* 14 x 6 mm). Two other November females had 1, 1 yolky follicles *ca* 5 mm diameter in their ovaries with other smaller follicles < 1.0 mm diameter. Two juveniles (SVL 28, 29 mm) collected in May. Stomach contents of 4 specimens from YWR included (a) 1 spider (Gnaphosidae), (b) 1 spider (Ctenidae), 1 moth and several termites, (c) 1 or 2 flies and several ants, (d) several spiders (Gnaphosidae and other families) and 1 isopod. One specimen from BNR had 1 spider and 1 ant in its stomach.

Diplodactylus pulcher YWR (November — 1, May 1; 2 ♂♂). Headtorching at night and in spider burrow in Salmon Gum woodland on sandy clay.

Diplodactylus spinigerus BNR (November 1 ♂). Headtorching in Jam woodland on fine sandy loam.

Gehyra variegata BNR, YR, YWR (November —25, May — 9, 17 ♀♀, 13 ♂♂, 4 juveniles).

Cryptozoic and in open at night. In open and in rubbish in Salmon Gum woodland on sandy clay, in rubbish in shrubland on sandy loam, under bark of Jam trees in woodland on sandy clay loam and in leaf litter and spoil in *Banksia prionotes*/*Xylomelum angustifolium* woodland on fine sandy loam. Eight November females (SVL 45-48 mm) had 1, 0 (4) and 0, 1 (4) oviducal eggs — largest 12 x 8 mm, smallest 9 x 5 mm. Three other November females had 1, 0 (2) and 0, 1 (1) yolky follicles *ca* 4 mm diameter with other smaller developing follicles of variable size. May females had smaller but greater numbers of follicles of variable size. Too few males were collected in May to allow comparison of testis size between seasons. Three juveniles (SVL 28-33 mm) were collected in November and 1 (SVL 33 mm) in May. These were too small to sex. Stomach contents of 5 specimens from YWR included (a) 1 moth (adult) and 1 spider, (b) termites and 1 spider, (c) 1 beetle (Scarabaeidae), 1 moth and 1 spider, (d) 1 moth and termites and (e) *ca* 20 termites and 1 spider. One from BNR had 1 cockroach, termites (*Coptotermes* sp.) and 1 spider.

Oedura reticulata YWR (November 1 ♂). Collected on trunk of *Eucalyptus salmonophloia* tree in loc. 1.1.

PYGOPODIDAE

Delma fraseri BNR (November 1 ♂). Among leaf litter in *Xylomelum angustifolium* woodland on fine sandy loam. Stomach contents included spiders.

AGAMIDAE

Amphibolurus minor BNR (November 4 ♀♀, 2 ♂♂). Active, in Jam woodland on fine sandy loam. One November female (SVL 126 mm) had 2, 4 oviducal eggs (*ca* 24 x 11 mm), and 17, 12 ovarian follicles of variable size, the largest *ca* 2 x 2 mm. Three other November females (SVL 82-86 mm) also had large numbers of ovarian follicles but were not gravid. These data may suggest that female *A. minor* do not breed until their second year when they achieve an SVL in excess of 100 mm. Stomach contents of 3 specimens included (a) several bugs (Pentatomidae), 1 grasshopper (Acrididae), 1 beetle and several ants, (b) several bugs (Pentatomidae), 1 grasshopper (Acrididae), and (c) a few ants and bugs (Pentatomidae).

Amphibolurus reticulatus BNR, YWR (November — 2, May — 1, 2 ♀♀, 1 ♂). In hollow log in Salmon Gum woodland on sandy clay, and on bitumen road with mallee road verge adjacent in November and dug from shallow

burrow in gravel railway line ballast in May. A November female (SVL 73 mm) had 2, 2 oviducal eggs (ca 16 x 10 mm) and 6, 4 ovarian follicles of variable size, the largest 2 x 3 mm. Stomach contents of two specimens from BNR included (a) a beetle, a wasp (Pompilidae), several ants (Formicidae), a centipede and a bug, and (b) several bugs (Pentatomidae) — greatest volume of food — ants, a beetle and a spider. Some seeds also present.

Moloch horridus BNR (November 1 ♀). Active, in *Banksia prionotes*/*Xylomelum angustifolium*/Jam woodland on fine sandy loam. Stomach contents: a large number of ants.

SCINCIDAE

Ctenotus pantherinus pantherinus BNR (November — 1, May — 1, 2 ♂♂). In bulldozer spoil in shrubland on fine sandy loam and 'shot on yellow sand in open shrubland'. Stomach contents of 1 specimen: mostly termites and 1 centipede.

Ctenotus schomburgkii BNR (November — 3, May — 1, 2 ♀♀, 1 ♂, 1 damaged). In pit traps in *Banksia prionotes*/*Xylomelum angustifolium*/Jam woodland on fine sandy loam. Also 'shot on yellow-sand in open shrubland' and 'in open scrub on deep yellow/orange sand'. Stomach contents of 1 specimen included: termites (*Coptotermes* sp.), 1 spider and 1 earwig.

Menetia greyii BNR, SBR, YR, YWR (November — 18, May — 3, 17 ♀♀, 2 ♂♂, 2 juveniles). In rubbish in Salmon Gum woodland on sandy clay, under litter in *Banksia prionotes* woodland on fine sandy loam, in sedge clump in *Casuarina campestris* shrubland on sandy clay loam, under asbestos in shrubland on sandy loam and under spoil in small *Eucalyptus gracilis* woodland (in loc. 3.1). Also 'under litter on yellow sand in open shrubland'. Ten November females (SVL 27-33 mm) were gravid with 0, 1 (4), 1, 1 (4), 1, 2 (1) and 1, 3 (1) oviducal eggs. There is an inverse relationship between clutch size and SVL as those animals with only 1 egg (4) were ≤ 30 mm SVL and those with more than 1 (6) were 33 mm SVL. Stomach contents of 2 specimens from BNR included (a) 1 spider (Salticidae), 3 termites, 1 wasp (*Trichorhachus australis* — Argidae), and (b) 5-6 termites (*Coptotermes* sp.).

Morethia obscura BNR, SBR, YR, YWR (November — 8, May — 5, 6 ♀♀, 7 ♂♂). In leaf litter in Salmon Gum woodland on sandy clay, in leaf litter and rubbish in *Banksia prionotes* woodland on fine sandy loam, active in shrubland on fine sandy loam, in rubbish in shrubland on sandy loam. Also 'under leaf litter on deep orange yellow sand' and 'under eucalypt leaf litter'. One November female (SVL 41 mm) had 1, 1 oviducal eggs ca 11 x 5 mm; another had 0, 2 yolky ovarian follicles ca 3 mm diameter and other smaller follicles of varying sizes. Stomach contents of 2 specimens from BNR included (a) 1 moth (adult), 1 spider and 1 isopod, and (b) several termites.

Tiliqua occipitalis BNR (November 1 ♂). In breakback trap in shrubland on fine sandy loam.

Tiliqua rugosa BNR, SBR, YR, YWR (November 2 ♂♂, 1 damaged, others seen). In York Gum (*Eucalyptus loxophleba*) woodland on sandy clay loam and in salt complex. Also in 'open shrubland on yellow sand' and 'in woodland on clay soil'. One female (SVL 230 mm) had 1 large yolky follicle *ca* 50 x 40 mm with *ca* 12 smaller follicles attached. Stomach contents of 1 specimen from YWR were mainly seeds (by volume) with the following insects: 1 dragonfly, 1 grasshopper (Acrididae), 1 beetle (Carabidae — *Calosoma schayeri*), and remains of bugs.

VARANIDAE

Varanus gouldii BNR (November 1 ♀). Dug from burrow in shrubland on fine sandy loam. A gravid female (SVL 300 mm) with 7, 5 oviducal eggs *ca* 36 x 26 mm.

ELAPIDAE

Denisonia gouldii BNR (May 3 ♂♂). In bulldozer spoil in shrubland on fine sandy loam.

Pseudechis australis. Not seen on reserves. A road-kill specimen was collected in November *ca* 6 km north of Yoting Siding. Cleared farm land with granite outcrops and Jam trees were on either side of the road.

Pseudonaja sp. (?*nuchalis*) BNR, YR. Two snakes seen, but not collected, in woodland on sandy clay loam and in cleared portion of YR overgrown with grass and weeds.

Vermicella bertholdi SBR (November 1 ♀). Under litter in *Banksia prionotes/Xylomelum angustifolium* woodland on fine sandy loam. A gravid female (SVL 175 mm) with 0, 1 oviducal egg (12 x 3 mm).

Discussion

Twenty species of reptiles and 6 species of frogs were recorded from these reserves. All are within their known range and have been previously recorded from wheatbelt reserves. Frogs are well represented with 6 of the 14 species known from the wheatbelt (Western Australian Museum records).

Only 4 species, *Neobatrachus pelobatoides*, *Menetia greyii*, *Morethia obscura* and *Tiliqua rugosa*, were recorded on all 4 reserves; these species are widespread in the wheatbelt and occupy a wide variety of habitat types. These are the smallest reserves we have examined in the wheatbelt so it is difficult to determine whether the low numbers of reptiles on SBR and YR are due to the small size or degraded habitat of these reserves.

Eleven species, including representatives of all lizard families collected, were breeding, i.e. had oviducal eggs or yolky follicles in their ovaries in November.

APPENDIX 1

Vegetation location numbers for reptiles collected.

	BNR	SBR	YR	YWR
<i>Heleioporus albopunctatus</i>	1.4, 1.1	*	1.3	1.3, 1.1/1.2
<i>Heleioporus</i> sp.	3.6			1.1/1.2
<i>Limnodynastes dorsalis</i>		1.1		
<i>Myobatrachus gouldii</i>		1.1		
<i>Neobatrachus centralis</i>				1.3
<i>Neobatrachus pelobatoides</i>	1.1	1.1/1.2	1.3	1.3
<i>Neobatrachus</i> sp.	1.1	*		1.3
<i>Pseudophryne guentheri</i>	4.1		3.1	1.1, 1.2, 1.3
<i>Crenadactylus ocellatus</i>	W			1.2
<i>Diplodactylus granariensis</i>				1.1
<i>Diplodactylus maini</i>	1.1		*	1.1, 1.2
<i>Diplodactylus pulcher</i>				1.1/1.2
<i>Diplodactylus spinigerus</i>	1.1			
<i>Gehyra variegata</i>	1.6		1.2, 3.1	1.1/1.2
<i>Delma fraseri</i>	1.2			
<i>Amphibolurus minor</i>	1.1			
<i>Amphibolurus reticulatus</i>	*			1.1/1.2
<i>Moloch horridus</i>	1.1			
<i>Ctenotus pantherinus pantherinus</i>	3.3			
<i>Ctenotus schomburgkii</i>	1.4, 1.2			
<i>Menetia greyii</i>	1.4, 3.1, 3.7	1.1/1.2, 3.1	*	1.2
<i>Morethia obscura</i>	1.4, 3.3	1.5, 1.1/1.2	3.1	1.2
<i>Tiliqua occipitalis</i>	3.3			
<i>Tiliqua rugosa</i>	1.8, 7.2	*	*	*
<i>Varanus gouldii</i>	3.3			
<i>Denisonia gouldii</i>	3.3			
<i>Pseudonaja</i> sp.	1.8		8.2	
<i>Vermicella bertholdi</i>		1.1/1.2		

Note: asterisk indicates specimen collected, but vegetation formation not recorded.

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VII REFERENCES

- ANON. (undated)—*Climatic Survey Region II — Great Southern Western Australia*. Melbourne: Commonwealth Bureau of Meteorology.
- ANON. (1975)—*Climatic averages. Western Australia*. Canberra: Aust. Govt. Publ. Service.
- BEADLE, N.C.W. & COSTIN, A.B. (1952)—Ecological classification and nomenclature. *Proc. Linn. Soc. N.S.W.* 77: 61-82.
- CHAPMAN, A. (1980)—Introduction to Yorkrakine Rock, East Yorkrakine and North Bungulla Nature Reserves. In: Biological survey of the Western Australian wheatbelt. Part 11. *Rec. West. Aust. Mus. Suppl.* no. 12:
- DELL, J. (1977)—Birds of Bending and West Bending Nature Reserves. In: Biological survey of the Western Australian wheatbelt. Part 3. *Rec. West. Aust. Mus. Suppl.* no. 5: 31-46.
- DELL, J. (1978)—Birds of Durokoppin and Kodj Kodjin Nature Reserves. In: Biological survey of the Western Australian wheatbelt. Part 6. *Rec. West. Aust. Mus. Suppl.* no. 7: 55-68.
- DELL, J. (1979)—Introduction to Wilroy Nature Reserve. In: Biological survey of the Western Australian wheatbelt. Part 8. *Rec. West. Aust. Mus. Suppl.* no. 8: 9-12.
- DELL, J. & JOHNSTONE, R.E. (1977)—The birds of Cockleshell Gully Reserve and adjacent areas. In: A vertebrate survey of Cockleshell Gully Reserve, Western Australia. *Rec. West. Aust. Mus. Suppl.* no. 4: 37-72.
- GARDNER, C.A. & BENNETTS, H.W. (1956)—*The toxic plants of Western Australia*. Perth: West Australian Newspapers.
- KITCHENER, D.J. (1975)—Reproduction in female Gould's Wattled Bat *Chalinolobus gouldii* (Gray) (Vespertilionidae), in Western Australia. *Aust. J. Zool.* 23: 29-42.
- KITCHENER, D.J. (1976)—Preface to the biological survey of the Western Australian wheatbelt. *Rec. West. Aust. Mus. Suppl.* no. 2: 3-10.
- KITCHENER, D.J. & CHAPMAN, A. (1976)—Mammals of Tarin Rock and North Tarin Rock Reserves. In: Biological survey of the Western Australian wheatbelt. Part 1. *Rec. West. Aust. Mus. Suppl.* no. 2: 61-67.
- KITCHENER, D.J. & CHAPMAN, A. (1980)—Mammals of Yorkrakine Rock, East Yorkrakine and North Bungulla Nature Reserves. In: Biological survey of the Western Australian wheatbelt. Part 11. *Rec. West. Aust. Mus. Suppl.* no. 12:
- MORRIS, K.D. & KITCHENER, D.J. (1979)—Mammals of Yornaning Nature Reserve. In: Biological survey of the Western Australian wheatbelt. Part 7. *Rec. West. Aust. Mus. Suppl.* no. 8: 29-33.
- MUIR, B.G. (1977a)—Biological survey of the Western Australian wheatbelt. Part 2. Vegetation and habitat of Bending Reserve. *Rec. West. Aust. Mus. Suppl.* no. 3.
- MUIR, B.G. (1977b)—Vegetation of West Bending Nature Reserve. In: Biological survey of the Western Australian wheatbelt. Part 4. *Rec. West. Aust. Mus. Suppl.* no. 5: 1-31.
- MUIR, B.G. (1978)—Vegetation of Wilroy Nature Reserve. In: Biological survey of the Western Australian wheatbelt. Part 8. *Rec. West. Aust. Mus. Suppl.* no. 8: 13-29.
- POLUNIN, N. (1960)—*Introduction to plant geography*. London: Longman.
- STORR, G.M. (1953)—Bird life at Yoting. *West. Aust. Nat.* 4: 21.
- STORR, G.M. & JOHNSTONE, R.E. (1979)—*Field Guide to the birds of Western Australia*. Perth: Western Australian Museum.