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9.—The genus Lerista (Lacertilia, Scincidae) in Western Australia.

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Abstract

The following 24 species and subspecies of *Lerista* (*sensu* Greer) are defined: *m. microtis* (Gray), *m. arenicola* nov., *frosti* (Zietz), *distinguenda* (Werner), *elegans* (Gray), *terdigitata* (Parker), *muelleri* (Fischer), *lineata* Bell, *planiventralis* (Lucas & Frost), *borealis* nov., *walkeri* (Boulenger), *neander* nov., *macropisthopus* (Werner), *desertorum* (Sternfeld), *p. picturata* (Fry), *p. baynesi* nov., *gerrardii* (Gray), *lineopunctulata* (Gray), *nichollsi* (Loveridge), *connivens* nov., *bipes* (Fischer), *labialis* nov., *humphriesi* nov. and *praepedita* (Boulenger).

Introduction

Regardless of all other characters, the numerous skinks with the lower eyelid transparent and immovable were placed by Boulenger (1887) in a single genus, *Ablepharus*. Until recently this arrangement was generally accepted, despite Malcolm Smith's warning (1937) that such a genus was almost certainly unnatural.

Greer (1967) has shown that certain species of *"Ablepharus"* agree with the skinks currently placed in *Rhodona* in all characters except the nature of the eyelid. He therefore combined the two groups under the oldest generic name, *Lerista*, restored from the synonymy of *Ablepharus*.

To appreciate how right Greer was to regard these differences in eyelid as trivial, and how wrong Boulenger was to regard them as fundamental, one has only to compare *"Ablepharus" muelleri* with *"Rhodona" terdigitata* or, better still, *"Ablepharus" distinguendus* with *"Rhodona" frosti*.

To do Boulenger justice, it must be acknowledged that his concept of *Rhodona* (combining the numerous little genera of earlier workers) was correct as far as it went. Mittleman's attempt (1952) to subdivide it was unsuccessful; taken literally, it would classify some individuals of *praepedita* as *Rhodona* and others as *Nodorha*.

The present paper is concerned with the 22 species of *Lerista* occurring in Western Australia. It is based on all the specimens in the Western Australian Museum (R prefix omitted from registered numbers), as well as those collected by the British Joint Services Expedition to Central Australia (specimen numbers prefixed with JSE), which were kindly lent to me by Lt Cdr A. Y. Norris before he deposited them in the British Museum.

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In the following descriptions the range in various quantitative characters is followed by the mean in brackets (except for *L. muelleri*, where geographic variation is such as to make overall means pointless). Among the measurements taken is the distance from snout to fore-leg; expressed as percentage snout-vent length, it provides an inverse measure of the degree to which the body is elongate. Owing to fusion with adjacent supraoculars, some supraciliaries may be missing, in which case the anterior and posterior counts are given separately, e.g. 1 + 3; when the anteriormost supraciliaries are absent, the counts are given in the form 0 + 3 etc.

Because of Greer's masterly exposition, it is unnecessary here to define *Lerista* fully or to repeat his observations on its anatomy and phylogenetic relationships. Readers are also referred to Greer's paper for the full generic synonymy of *Lerista*.

Genus Lerista Bell

Lerista Bell, 1833, Proc. Zool. Soc. (Lond.), p. 99. Type-species (by monotypy): *Lerista lineata* Bell.

Diagnosis.—Small to moderately large, elongate, smooth-scaled, cryptozoic skinks with fragile tail and feeble, widely separated limbs (pentadactyl in two species, but digits fewer in all others; fore-limb may be reduced to a style, tubercle or groove, or be completely absent; hind-limb may be reduced to a style); supranasals and postnasals absent; prefrontals small and widely separated, or absent; frontal wider than supraocular region; lower eyelid partly or wholly transparent, movable or fixed; ear-aperture minute; preanals enlarged; colour pattern longitudinal (dark stripes, lines or rows of spots) or absent. Distinguishable from *Hemiergis* by broad contact between frontal and frontonasal, presence of ear-aperture, and absence of yellow or reddish ventral pigments; and from *"Leiolopisma"* by larger nasals, narrower supraocular region, smaller ear-aperture and weaker limbs. *Lerista* with ablepharine eyes distinguishable from all other *"Ablepharus"* by having fewer than 5 toes.

Distribution.—Australia and Tasmania.

General description of western species.—Snout-vent length (mm) 21-103. Length of appendages &c. (% SVL): fore-leg 0-21, hind-leg 1.5-35, tail 48-142, snout to fore-leg 19-38.

Nasals forming median suture or narrowly separated (widely in *planiventralis*). Fronto-parietals moderately large and forming median suture, or small and separated, or fused to each

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other (in which case they may be fused to interparietal). Enlarged nuchals 0-5 on each side. Loreals 2 (one in *praepedita*). Upper labials 5-7, third-last subocular. Temporals normally 1 + 2 (1 + 1 in *planiventralis* and *humphriesi*), upper secondary usually largest, lower secondary smallest. Midbody scale-rows 14-24. Lamellae under longest toe 4-21.

In most taxa there is a dark upper lateral stripe from nasal through orbit to tail. Also common are two dorsal series of dark dots or dashes, which may be modified into paravertebral lines or a vertebral stripe. A few taxa are almost patternless, except for contrasting darker dorsal and paler ventral sufaces.

Material.—*L. m. microtis* (8 specimens), *m. arenicola* (3), *bougainvillii* (2), *frosti* (51), *distinguenda* (39), *orientalis* (1), *elegans* (34), *terdigitata* (6), *muelleri* (84), *lineata* (10), *planiventralis* (11), *borealis* (3), *neander* (4), *macropisthopus* (27), *desertorum* (27), *p. picturata* (10), *p. baynesi* (15), *gerrardii* (18), *lineopunctulata* (62), *nichollsi* (12), *connivens* (13), *bipes* (166), *labialis* (46), *humphriesi* (1), *praepedita* (75).

Key to Species

1.	Fingers 3-5, equal in number to toes	2
	Fingers 0-2, usually less numerous than toes	7
2.	Fingers 5; supraciliaries 6; labials 7	*microtis*
	Fingers and supraciliaries fewer; labials 6	3
3.	Fingers 4	4
	Fingers 3	6
4.	Eyelid movable; supraciliaries 5	*frosti*
	Eyelid fixed; supraciliaries 3 or 4	5
5.	Scale-rows 18 or 20; nasals usually separated	*distinguenda*
	Scale-rows 16; nasals forming median suture	*elegans*
6.	Eyelid movable; supraoculars 4	*terdigitata*
	Eyelid fixed; supraoculars 3	*muelleri*
7.	Digits 2+3	8
	Digits fewer	12
8.	Eyelid fixed; scale-rows 16	*lineata*
	Eyelid movable; scale-rows 20-24	9
9.	Strong ventrolateral keel; temporals 1 + 1	*planiventralis*
	No ventrolateral keel; temporals 1 + 2	10
10.	Dark upper lateral stripe and paravertebral lines	*desertorum*
	No stripes or lines	11
11.	Frontoparietals separated; supraciliaries normally fewer than 5	*macropisthopus*
	Frontoparietals contiguous; supraciliaries 5	*borealis*
12.	Interparietal free	13
	Interparietal fused to frontoparietals	19
13.	Frontoparietals paired	14
	Frontoparietals fused	*walkeri*
14.	Nasals contiguous	15
	Nasals separated	17
15.	Toes 3; supraciliaries 5	(?) *borealis*
	Toes and supraciliaries fewer	16
16.	Fore-limb, prefrontals and supraciliaries present	*picturata*
	Fore-limb, prefrontals and supraciliaries absent	*praepedita*
17.	Dark vertebral and upper lateral stripes	*gerrardii*
	No stripes	18
	Dorsal and upper lateral surfaces spotted	*neander*
18.	Dorsal and upper lateral surfaces unicolorous	*macropisthopus*
19.	Some indication of fore-limb (e.g. groove); prefrontals normally present	20
	No indication of fore-limb; no prefrontals	22
20.	Dark vertebral and upper lateral stripes	21
	No stripes	*lineopunctulata*
21.	Eyelid fixed	*nichollsi*
	Eyelid movable	*connivens*
22.	Toes 2; scale-rows 19-20	23
	Hind-limb stylar; scale-rows 16	24
23.	Two supraoculars contacting frontal; supraciliaries 1 or 2	*bipes*
	One supraocular contacting frontal; no supraciliaries	*labialis*
24.	Labials 6; loreals 2; temporals 1 + 1; one supraciliary	*humphriesi*
	Labials 5; loreal 1; temporals 1 + 2; no supraciliaries	*praepedita*

Lerista microtis microtis

Mocoa microtis Gray, 1845, Cat. Liz. Brit. Mus., p. 83. Swan River [Colony] (J. Gilbert).

Diagnosis. A small slender species with digits 5 + 5 and movable eyelid, distinguishable from *L. bougainvillii* (Gray) by 4 supraoculars (not 3), 6 supraciliaries (not 5) and longer limbs (e.g. hind-leg about as long as distance from snout to fore-leg).

Distribution. Far south of Western Australia from the Scott River east to Israelite Bay.

Description. Snout-vent length (mm) 22-48.5 (39.0). Length of appendages &c (% SVL): fore-leg 14.4-22.7 (16.7); hind-leg 24.7-35.0 (29.3); tail 105-134 (116.7); snout to fore-leg 27.0-36.4 (30.2).

Nasals narrowly separated (in very short contact in one specimen). Prefrontals widely separated. Frontal slightly shorter than frontoparietals and interparietal combined, slightly wider than supraocular region. Frontoparietals in long contact, about as large as interparietal. Nuchals 3 or 4 (3.5). Supraoculars 4, first two in contact with frontal. Supraciliaries 6. Upper labials 7. Upper secondary temporal largest, lower secondary smallest. Midbody scale-rows 18 or 20. Lamellae under longest toe 18-21 (19.2).

Dorsally olive grey, without pattern. Blackish-brown stripe from orbit to middle of tail, narrowly and indistinctly margined above with pale grey (margin clearer and wider on tail, and on back it may be indistinctly edged above with black). White midlateral stripe from upper lips to base of tail passing over ear aperture and partly interrupted by thigh. Dark grey or blackish ventrolateral stripe from about level of ear to level of vent, interrupted partly by arm and completely by thigh. Venter whitish; under tail reddish; gulars and ventrals may be edged with grey.

Remarks. As this species does not occur near Perth, the holotype was probably collected at Albany.

Material. **South-West Division (W.A.):** Scott River (36047-8); Denmark (31063, 31195); Cheyne Beach (10755, 36017); Bremer Bay (33410). **Eucla Division (W.A.):** Israelite Bay (31103).

Lerista microtis arenicola subsp. nov.

Holotype. R 24608, an adult collected by G. M. Storr and A. M. Douglas on 7 October 1964 at Eucla, Western Australia, in 31° 43'S, 128° 53'E.

Diagnosis. Distinguishable from *L. m. microtis* by longer limbs, larger nasals, more numerous midbody scale-rows and narrower upper lateral stripe.

Distribution. Coastal dunes round head of Great Australian Bight from Eucla (W.A.) east to Fowlers Bay (S.A.).

Description.—Snout-vent length (mm) 47-56 (50.0). Length of appendages &c. (% SVL): fore-leg 16.5-21.0 (19.5); hind-leg 27.8-32.3 (30.8); snout to fore-leg 29.2-33.0 (31.4).

Nasals in short to moderately long contact. Prefrontals widely separated. Frontal about as long as frontoparietals and parietal combined and about as wide as supraocular region. Frontopariels in long contact, a little larger than interparietal. Nuchals 2 or 3 (2.7). Supraoculars 4, first two in contact with frontal. Supraciliaries 6. Upper labials 7. Upper secondary temporal largest, lower secondary smallest. Midbody scale-rows 22. Lamellae under longest toe 17-21 (19.0).

Differing in coloration from *L. m. microtis* in dark upper lateral stripe not so wide as white midlateral stripe, not edged above with whitish, extending forward to snout and becoming broken on tail; ventrolateral stripe fainter and narrower.

Remarks. Though geographically intermediate between *microtis* and *bougainvillii*, *L. m. arenicola* is morphologically intermediate only in body size and the number of midbody scale-rows. For this reason the southeast Australian form is tentatively regarded as a distinct species.

Paratypes. **South Australia**: Fowlers Bay (24586-7).

Lerista frosti

Rhodona tetradactyla Lucas & Frost, 1895, Proc. Roy. Soc. Vict. (n.s.) 7 : 268. Tempe Downs, Northern Territory (Horn Expedition).

Lygosoma frosti Zietz, 1920, Rec. S. Aust. Mus. 1 : 217. New name for above, not *Lygosoma tetradactylum* (O'Shaugnessy) of Boulenger (1887 : 288).

Diagnosis. Small slender species with digits 4 + 4 and movable eyelid. Further distinguishable from *L. distinguenda* by greater size and more numerous supraciliaries, and from *L. orientalis* (De Vis) by longer limbs.

Distribution. Islands, shores and hinterland of Great Australian Bight from the Archipelago of the Recherche (W.A.), east to Eyre Peninsula (S.A.) and inland to the Nullarbor Plain; with outlying populations in the North-West Division (Hamersley and Barlee Ranges) and the south of the Northern Territory (upper valley of the Finke).

Description.—Snout-vent length (mm) 23-56 (45.7). Length of appendages &c. (% SVL): fore-leg 8.6-15.2 (10.8); hind-leg 19.6-30.4 (23.0); tail 94-131 (110.3); snout to fore-leg 24.1-37.0 (28.5).

Nasals narrowly separated (rarely touching or moderately widely separated). Prefrontals widely separated. Frontoparietals in moderately long contact, usually smaller than interparietal. Nuchals 2-4 (2.8). Supraoculars 3, first two in contact with frontal. Supraciliaries 5. Upper labials 6. Upper secondary temporal much the largest, lower secondary smallest. Midbody scale-rows 18 or 20. Lamellae under longest toe 13-20 (16.8).

Dorsally pale olive-grey or olive-brown, with or without 2 or 4 black dorsal lines from occiput to base of tail, central pair (paravertebral) often continuing nearly to end of tail. Blackish-brown stripe from nasal through orbit to base or middle or end of tail; on body it may be narrowly margined above and below by a whitish line. Sides of body greyish-white with or without 2 (sometimes 3) dark grey lines or series of dots. Lips narrowly barred with dark grey. Throat whitish; ventrals tipped with grey; subcaudals pinkish buff; palms, soles and under digits dark grey except for distal cluster of whitish plantar granules.

Geographic variation. From the above description are excluded the three specimens from the North-West Division. They tend to be more brownish or coppery dorsally and more strongly spotted with blackish brown on the tail and sides of body; in two of them, moreover, the tail is orange-red. Their nasals are in contact; and as in other isolated populations (Central Australia and Mondrain Island) there are 20 midbody scale-rows, whereas nearly all specimens from the southern mainland have 18.

Material. **North-West Division**: Millstream (36152); 9 mi. S of Wittenoom (37078); Kookhabinna Gorge (25268). **Eucla Division (W.A.)**: Mondrain Island (10121); Israelite Bay (14174); Junana Rock (36245); Coragina Rock (18514, 36183); Balladonia (17405-7, 29892); Cocklebiddy (34488); Seemore Downs (18527-8); Loongana (29179); Madura (29464); 28 mi. W of Eucla (33434); Eucla (289-90, 24625-39, 31881-3; ERP 13707-8). **South Australia**: Smoky Bay (24563-5); Arno Bay (27315-6); Port Neill (27324); Tumby Bay (27353-4). **Northern Territory**: Palm Valley (20862-3).

Lerista distinguenda

Ablepharus distinguendus Werner, 1910, "Fauna Südwest-Australiens" 2 : 490. Fremantle, Western Australia (W. Michaelsen & R. Hartmeyer).

Diagnosis. Small slender species with digits 4 + 4 and fixed eyelid, distinguishable from *L. elegans* by separated nasals and more numerous midbody scale-rows.

Distribution. Southwest and south of Western Australia north to Geraldton, east to Great Australian Bight (Twilight Cove) and inland to Eradu, New Norcia, Northam and Cranbrook; also on Rat Island (Houtman Abrolhos).

Description. Snout-vent length (mm) 24-46 (38.5). Length of appendages &c. (% SVL): fore-leg 10.6-16.7 (13.6); hind-leg 19.6-30.2 (25.9); tail 98-129 (115.0); snout to fore-leg 24.8-36.0 (30.3).

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Nasals narrowly separated (occasionally just touching, rarely forming a short suture). Prefrontals moderately to widely separated. Frontoparietals in medium to long (rarely short) contact, as large as interparietal or a little smaller. Nuchals 1-4 (2.7). Supraoculars 3, first two in contact with frontal. Supraciliaries usually 3, occasionally 4. Upper labials 6 (rarely 7). Upper secondary temporal much the largest, lower secondary much the smallest. Midbody scale-rows 18 (rarely 19 or 20). Lamellae under longest toe 13-20 (16.8).

Dorsally pale olive-grey (occasionally olive-brown) with or without 2 or 4 longitudinal series of dark dots. Head usually concolorous with back, finely blotched with black. Black upper lateral stripe from snout through orbit to tail. White midlateral stripe from lips to base of tail, more or less sharply defined from grey clouding (or dotting) of ventrolateral surfaces. Under tail pinkish buff sparsely dotted with dark brown.

Remarks. Most populations of *distinguenda* are readily separated from neighbouring populations of *elegans*, not only by their key characters (18 or more scale-rows and separated nasals) but also by their shorter and broader interparietal (and, to a lesser extent, frontal), fewer nuchals, paler coloration (especially of head) and stronger pattern. Some populations are nevertheless hard to place owing to poor correlation between key and subsidiary characters (where these conflict, I have arbitrarily relied on the former).

Generally *distinguenda* occurs to the east of *elegans*, but it has reached the coast at Geraldton, Guilderton, Fremantle and even Rat Island. Though surrounded by populations of *elegans* at each of these localities, *distinguenda* remains distinctive here. It is south of the range of *elegans*, that *distinguenda* is most apt to share subsidiary characters with *elegans*.

Material. **South-West Division (W.A.)**: Rat Island (30447-9); near Geraldton (1731-2); Eradu (11127); Coomberdale (7206); 7 mi. N of New Norcia (25675); Guilderton (26490); Mt. Lawley (8851); Culham (22455-7); Northam (6900); Kalamunda and 6 mi. E (14870, 16900, 20595); Bickley Camp (29896); Roleystone (18525); Boddington (13558, 31042-9); Narrogin (25969); Yarloop (18515); Collie (18516); Kojonup (3006); Katanning (23353); Cranbrook (11018); Margaret River (7962); Albany (10947). **Eucla Division (W.A.)**: Esperance (11785, 17865); 15 mi. SE of Cocklebiddy (34477).

Lerista elegans

Miculia elegans Gray, 1845, "Cat. Liz. Brit. Mus.", p. 46. Western Australia (J. Gilbert).

Diagnosis. Small slender species with digits 4 + 4 and fixed eyelid, distinguishable from *L. distinguenda* by 16 midbody scale-rows and nasals forming median suture.

Distribution. West coast and islands of Western Australia from Barrow Island south to Rottnest Island; and on the mainland from a little north of the Murchison south to Perth, inland to Lockwood Springs and the Darling Range.

Description. Snout-vent length (mm) 21-43 (34.8). Length of appendages &c. (% SVL): fore-leg 11.2-19.0 (15.3); hind-leg 23.7-34.6 (28.6); tail 100-136 (118.7); snout to fore-leg 28.9-37.6 (31.9).

Nasals in medium to long contact. Prefrontals widely to moderately separated. Frontoparietals in medium to long contact, smaller than interparietal. Nuchals 2-5 (3.4). Supraoculars 3, first two in contact with frontal. Supraciliaries usually 3, occasionally 4. Upper labials 6 (rarely 7). Upper secondary temporal much the largest, lower secondary usually much the smallest. Midbody scale-rows 16 (rarely 18). Lamellae under longest toe 13-20 (16.4).

Dorsally olive-brown; paravertebrals with darker centres; head unpatterned, uniformly darker than back. Dark brown stripe from snout nearly to end of tail, narrowly margined below with white. Ventrolateral (and sometimes ventral) surfaces clouded with grey. Under tail dotted with greyish brown. Under digits blackish.

Remarks. It is not yet certain whether *elegans* and *distinguenda* should be treated as separate species. Some series, though closer to *elegans* in coloration, were identified with *distinguenda* because of their scale count and separated nasals. Conversely the Rottnest Island specimen was identified with *elegans* despite its coloration.

Material. **North-West Division (W.A.)**: Barrow Island (28675-6); Bernier Island (13184, 20526-7). **South-West Division (W.A.)**: Gie Gie, 21 mi. NNW of Murchison House (34047); Lockwood Springs, 20 mi. ESE of Kalbarri (33475); Stockyard Gully, SW of Eneabba (27985); Fisherman Island (18526); Mt Yokine (21576); Wembley (14664, 14874, 17659, 18517-24, 19156); Claremont (10763); Cottesloe (4385); Mt Pleasant (25072); Canning Dam (26491); Rottnest Island (3729).

Lerista terdigitata

Lygosoma (Rhodona) terdigitatum Parker, 1926, Ann. Mag. Nat. Hist. (9) 18 : 203. Flinders Island. Investigator Group, South Australia (F. Wood Jones).

Diagnosis. Small slender species with digits 3 + 3, distinguishable from *L. muelleri* by 4 supraoculars (rather than 3) and movable eyelid.

Distribution. Shores, islands and hinterland of Great Australian Bight from Balladonia (W.A.) east to Smoky Bay (S.A.).

Description. Snout-vent length (mm) 46-61 (53.4). Length of appendages &c. (% SVL): fore-leg 10.6-11.6 (11.2); hind-leg 20.6-24.8 (22.9); tail 96-100 (97.8); snout to fore-leg 28.4-30.6 (29.4).

Nasals narrowly separated or in short to medium contact. Prefrontals widely separated. Frontoparietals usually in contact, occasionally very narrowly separated, usually smaller than interparietal. Nuchals 1-3 (2.6). Supraoculars 4, first two in contact with frontal. Supraciliaries 5. Upper labials 6. Upper secondary

temporal much the largest, lower secondary smallest. Midbody scale-rows 18-22. Lamellae under longest toe 13-15 (14.0).

Dorsally olive-grey (South Australia) or olive-brown (Western Australia) with 4 longitudinal series of black dots on back. Blackish stripe from nasal through orbit to base of tail. Upper surface of limbs mainly blackish brown. Ventrolateral and ventral surfaces whitish with longitudinal series of blackish-brown dots (about 12 in South Australia; 8 or 10 in Western Australia). Under toes and feet dark.

Geographic variation. At present this species is known only from two widely separated areas. In addition to the slight differences in coloration mentioned above, western specimens have fewer midbody scale-rows than eastern (18 or 20, against 20 or 22).

Material. **Eucla Division (W.A.):** Coragina Rock, 40 mi. S of Balladonia Hotel (17197); 4 mi. S of Balladonia Hotel (17467); 12 mi. SW of Balladonia HS (17442). **South Australia:** Fowlers Bay (24588); Smoky Bay (24566-7).

Lerista muelleri

Phaneropus muelleri Fischer, 1881, Arch. Naturgesch. 47 : 236. Nickol Bay, Western Australia (F. von Mueller).

Ablepharus timidus De Vis, 1888, Proc. Linn. Soc. NSW. (2) 2 : 824. Charleville, Queensland.

Ablepharus rhodonoides Lucas & Frost, 1896, Proc. Linn. Soc. NSW. 21 : 281. Mildura, Victoria (W. Fielder).

(?) Lygosoma (Rhodona) goerlingi Ahl, 1935, Zool. Anz. 112 : 204. Wurarga, Western Australia (A. Goerling).

Diagnosis. Small slender species with digits 3 + 3, fixed eyelid and 3 suproculars.

Distribution. Western Australia north and east to Anna Plains, Mt. Edgar, Weld Spring, Sutherland Range and Warburton Range, and south and west to Hamelin Pool, the lower Murchison River (The Loop), Morawa, Ballidu, Bencubbin, Westonia, Norseman and Balladonia; thence east through northern South Australia to southwest Queensland and northwest Victoria.

Description. Snout-vent length (mm) 24-49. Length of appendages &c. (% SVL): fore-leg 7.1-16.0; hind-leg 17.4-28.8; tail 104-142; snout to fore-leg 24.2-32.4.

Nasals usually in contact, occasionally narrowly separated. Prefrontals widely separated. Frontoparietals fused or paired (in which case they are in long contact and usually smaller than interparietal). Nuchals 1-4. Supraoculars 3, the first two in contact with frontal. Supraciliaries 2-5. Upper labials 6. Upper secondary temporal much the largest, lower secondary smallest. Midbody scale-rows 18-22. Lamellae under longest toe 12-17.

Dorsally olive grey or brown with or without four dark grey or blackish lines or series of dots. Lateral coloration clear-cut or diffuse, i.e. blackish-brown stripe from snout through orbit to tail, contrasting with whitish flanks; or sides finely dotted with blackish brown, darkest and densest superiorly to form a narrow, indistinct upper lateral stripe; in both colour-types, upper lateral stripe may be narrowly edged above by paling of dorsal ground colour.

Geographic variation. The few specimens available to Glauert (1961) came from widely separated regions, and he understandably allocated them to two species: a northwestern (*"Ablepharus muelleri"*) with clear-cut pattern, paired frontoparietals, long narrow frontal and relatively long appendages; and a southeastern (*"A. rhodonoides"*) with diffuse pattern, fused frontoparietals, shorter and wider frontal and shorter appendages. When series from the intervening regions are examined, it becomes impossible to delimit two races, let alone species.

All the characters that might separate *"rhodonoides"* from *"muelleri"* undergo continuous variation, except of course for the nature of the frontoparietals. Fused frontoparietals occur in the Eastern States and in the interior of Western Australia north to the upper Fortescue and west to Turee Creek, Meka, Youanmi, Coolgardie and Norseman. Paired frontoparietals are found only in the western populations, north to Anna Plains and east to Mt. Edgar, Tambrey, Barlee Range, lower Murchison and eastern Wheat-Belt. Though regionally constant and capable of precise geographic definition, the nature of the frontoparietals is not correlated with any other character.

Wheat-Belt specimens are very like those from the Eastern Goldfields, except for their paired frontoparietals. On the other hand they differ considerably in coloration etc. from the populations along the northwest coast; but the change, via the lower Murchison and Carnarvon Basin, is too gradual to permit meaningful demarcation. Indeed, the only place where a boundary might be drawn between a restricted *muelleri* and a *"rhodonoides"* is along the Ophthalmia Range, to the north of which (at Weeli Wolli and Poonda) are skinks very like those from the Eastern Goldfields, whereas to the south (at Turee Creek) *"muelleri"* characters predominate. The Turee Creek skinks, however, agree with those from Poonda and Weeli Wolli in having fused frontoparietals.

Not all populations fit the prevailing pattern of clinal change from southeast to northwest. Specimens from the Roebourne Tableland and Hamersley Range are especially distinctive. They are characterised by large size, relatively long fore-limbs but short hind-limbs, brownish and weakly patterned coloration, and the tendency for supraciliaries to fuse with supraoculars (so that supraciliary formulae like 1 + 1 or 1 + 2 are frequent).

Material. **Islands off North-West Coast (W.A.):** Legendre (14361-2); Rosemary (14531); Barrow (29041); Thevenard (27988). **North-West Division (W.A.):** Anna Plains (27989); Strelley River (31041); Nickol Bay (17023-4); Cossack (18535); Mt. Herbert (20076-7); Tambrey and Asbestos Gorge (20071-5); Woodstock (13097); Mt. Edgar (18534); Weeli Wolli (22639); Poonda (22641-2, 28438-40); Turee Creek (25143-6); Ullawarra and 21 mi. NNW (15820), 25255); Learmonth (11526); Minilya (10613, 18536); Manberry (9220); Booloogooroo (27987); 12 mi. E of Hamelin Pool HS. (29678); Meka (29280). **South-West Division (W.A.):**

The Loop, lower Murchison (29621-2, 29629, 29633-4); 11 mi. W of Morawa (29718); Caron (22992); Ballidu (29888); Bencubbin (19998); Westonia (28922). **Eastern Division (W.A.):** McConkey Hill (27990-1); Weld Spring (27992); Windich Spring (15852-3); Mt. Fisher (13713); Sutherland Range (28880); Warburton Range (18508-10); Lake Throssell (18511); White Cliffs (20663); Mt. Morgans (15687); Coolgardie (18506); Kalgoorlie (18507); Cundeelee (18512, 21673); 11 mi. E of Zanthus (12224); 46 mi. SSE of Karonie (17339). **Eucla Division (W.A.):** 18 mi. E of Norseman (18533); Newman Rock (18531-2); 7 and 4 mi. S of Balladonia Hotel (17388, 17466); Noondonia (17394-5, 17398-400); Smithania Rock (25513). **South Australia:** Kingoonya (24494-5). **Queensland:** Cunnamulla (18542-3).

Lerista lineata

Lerista lineata Bell, 1833, Proc. Zool. Soc. (Lond.), p. 99. Australia.

Diagnosis. Small slender species with digits 2 + 3 and fixed eyelid.

Distribution. Vicinity of Fremantle, Western Australia (including Rottnest and Garden Islands).

Description. Snout slightly protrusive. Fore-limb groove deep and very long. Snout-vent length (mm) 26-55 (47.0). Length of appendages &c. (% SVL): fore-leg 6.7-8.5 (7.5); hind-leg 19.8-24.8 (21.2); tail 102-103; snout to fore-leg 24.8-34.2 (27.1).

Nasals narrowly separated (occasionally just touching). Prefrontals widely separated. Frontoparietals in short to long contact, smaller than interparietal. Nuchals 3-5 (4.0). Supraoculars 3, first two in contact with frontal. Supraciliaries 3. Upper labials 6. Upper secondary temporal much the largest, lowest secondary much the smallest. Midbody scale-rows 16. Lamellae under longest toe 13-17 (14.7).

Dorsally brownish grey, darker and browner between paravertebral lines. Pair of black paravertebral lines from occiput nearly to end of tail, on which they break into series of dots. Black upper lateral stripe from snout, lores or orbit to end of tail. Narrow greyish-white midlateral stripe from posterior upper labials to base of tail, passing well above fore-limb but slightly interrupted by hind-limb. Head and lips blotched with black. Remaining surfaces washed or dotted with grey, most strongly under tail and on ventrolateral surface of body.

Material. **South-West Division (W.A.):** "Perth" (8172); East Fremantle (26813-4); Rottnest Island (3255-6, 3757); Garden Island (9230, 13026, 18538, 28480).

Lerista planiventralis

Rhodona planiventralis Lucas & Frost, 1902, Proc. Roy. Soc. Vict. 15 : 78. Western Australia.

Diagnosis. Medium-sized species with digits 2 + 3 and movable eyelid, distinguishable from all other *Lerista* by ventrolateral keel.

Distribution. Mid-west coast and near-coastal sandplains of Western Australia from North West Cape south to Watheroo; Bernier Island.

Description.—Snout depressed, extending well beyond mouth and terminating in cutting edge. Entire ventral surface flat, boundary between ventral and lateral surfaces of body marked by strong keel. Snout-vent length (mm) 31-66 (54.7). Length of appendages &c. (% SVL): fore-leg 6.8-9.4 (7.9); hind-leg 22.4-28.5 (25.6); tail 81-100 (90.3); snout to fore-leg 26.0-29.0 (27.2).

Nasals widely separated. Prefrontals widely separated. Frontoparietals in medium to long contact, much smaller than interparietal. Nuchals 0-3 (2.0). Supraoculars 3, first two in contact with frontal. Supraciliaries 5. Upper labials 6 (sometimes apparently 7, owing to enlargement of postlabial). Temporals 2, secondary much larger than primary. Midbody scale-rows 20-24. Lamellae under longest toe 12-16 (13.7).

Dorsally pale olive-grey or brown, becoming dark grey on head and/or snout. Four brown or blackish dorsal lines beginning on neck, inner pair more conspicuous and extending on to tail, outer pair tending to break up into series of dots and not extending beyond level of hind-legs. Dark-brown or blackish stripe from nasal through orbit to tail (on which it becomes darker, wider and dorsolateral in position). Remaining surfaces whitish, except in some specimens for greyish suffusion on face and chin.

Geographic variation. The three specimens from south of Shark Bay alone have fewer than 22 scale-rows, and their nasals are not quite so widely separated as in northern specimens. The southernmost specimen (Watheroo) is unique in having the frontoparietals fused.

Material. **North-West Division (W.A.):** Neds Creek, North West Cape (27916); Warroora (8158); Carnarvon (360-1); Bernier Island (11247-50, 20505). **South-West Division (W.A.):** Lockwood Spring, 20 mi. ESE of Kalbarri (33473-4); Watheroo (796).

Lerista borealis sp. nov.

Holotype. R 22363 in Western Australian Museum, collected by K. T. Richards on 28 July 1963 at Thompson Spring, Western Australia, in 16° 02′S, 128° 57′E.

Diagnosis. Moderately small and slender species with digits 2 + 3, movable eyelid, frontoparietals forming median suture, and scarcely any colour pattern.

Distribution. Hills of the Kimberley Division, Western Australia.

Description. Snout-vent length (mm) 44-51 (48.0). Length of appendages &c. (% SVL): fore-leg 7.7-8.1 (7.9); hind-leg 15.6-18.0 (16.9); tail 114; snout to fore-leg 26.7-28.4 (27.8).

Nasals narrowly separated or just touching. Prefrontals widely separated. Frontoparietals in medium or long contact, smaller than interparietal. Nuchals 2 or 3 (2.8). Supraoculars 3, first two in contact with frontal. Supraciliaries 5. Upper labials 6. Upper secondary temporal much the largest; lower secondary a little smaller than primary. Midbody scale-rows 20 or 22. Lamellae under longest toe 11-13 (11.5).

Dorsal and upper lateral coloration reddish or greyish brown, obscurely flecked or dotted with dark brown. Upper lips may be heavily barred. Under surface pale brown, flecked under tail with dark brown.

Remarks. A single specimen (27915) from Kalumburu, north Kimberley, is tentatively excluded from *borealis*. It has a more slender and elongate body, sharper snout, darker coloration, smaller appendages (tail 73% SVL; fore-leg 2.6% SVL with one finger on one side and a style on other; hind-leg 13.3% SVL and with 8 or 9 lamellae under longest of 3 toes), larger nasals (forming long median suture), smaller frontoparietals (narrowly separated and very much smaller than interparietal), primary temporal only a little smaller than upper secondary but much larger than lower secondary, and 18 midbody scale-rows.

Paratypes. **Kimberley Division (W.A.):** Point Springs, Weaber Range (26773); 20 mi. W of Mt Elizabeth HS (32344).

Lerista walkeri

Lygosoma walkeri Boulenger, 1891. Ann. Mag. Nat. Hist. (6) 8 : 405. Roebuck Bay and Condillac Island, Western Australia (J. J. Walker).

Diagnosis. Moderately small species with digits 2 + 2, movable eyelid, frontoparietals fused, and dorsal pattern of black dots.

Distribution. Coastal north and west Kimberley, Western Australia.

Description (after Boulenger). Snout-vent length (mm) 60. Length of appendages (% SVL): fore-leg 8, hind-leg 15.

Nasals forming median suture. Prefrontals widely separated. Frontoparietals fused into single shield, much shorter than interparietal. Nuchals 3. Supraoculars 3, first two in contact with frontal. Supraciliaries 5. Upper labials 6. Midbody scale-rows 20.

Dorsally greyish, each scale dotted black. Lips dotted black. Under surface whitish, tail dotted black.

Material. None examined.

Lerista neander sp. nov.

Holotype. R 23988 in Western Australian Museum, an adult collected by C. Snell on 8 November 1964 at Mt. Newman, Western Australia, in 23° 17'S, 119° 32'E.

Diagnosis. Large species with snout depressed, moderately sharp in profile and extending well beyond mouth; digits 2 + 2 (occasionally reduced); movable eyelid; and dorsal and upper lateral pattern consisting of lines of dark spots. Distinguishable from *L. walkeri* by separated nasals, paired frontoparietals, and anterior supraciliaries fused to supraoculars.

Distribution. Ophthalmia Range, Western Australia.

Description. Snout-vent length (mm) 73-88 (80.5). Length of appendages &c. (% SVL). fore-leg 3.9-4.1 (4.0); hind-leg 12.5-14.1 (13.4); tail 104 (1 specimen); snout to fore-leg 22.4-23.6 (23.0).

Nasals separated. Prefrontals widely separated. Frontoparietals moderately to narrowly separated or just touching, smaller than interparietal. Nuchals 1-3 (2.3). Supraoculars 3, first two in contact with frontal. Supraciliaries 0 + 3. Upper labials 6. Upper secondary temporal largest, lower secondary much the smallest. Midbody scale-rows usually 20, occasionally 18. Lamellae under longest toe 11 or 12.

Dorsally greyish brown. Total of 8 dorsal and upper lateral series of squarish blackish-brown spots, each occupying centre of a scale; spots on enlarged nuchals coalescing into transverse bars; lowest series of spots on tail becoming midlateral and finally ventrolateral in position; mid-dorsal spots on tail transversely elongate. Head, face and lips blotched with blackish brown. Under surface whitish except for dark grey under toes and dark brown dots under tail (tending to align longitudinally).

Paratypes. **North-West Division (W.A.):** Mt. Newman (23989, 26528-9).

Lerista macropisthopus

Lygosoma (Rhodona) macropisthopus Werner, 1903. Zool. Anz. 26 : 246. "Queensland."

Diagnosis. Large species with digits 2 + 3 (locally reduced), movable eyelid, frontoparietals paired, and no colour pattern.

Distribution. Southwestern interior of Western Australia, north to the Gascoyne, south to the central Wheat-Belt (Narembeen), west nearly to Kalbarri and to Wongan Hills, and east to Atley and Jeedamya.

Description. Snout-vent length (mm) 61-94 (82.7). Length of appendages &c. (% SVL): fore-leg 2.7-5.0 (3.7); hind-leg 12.5-17.7 (15.3); tail 69-103 (91.5); snout to fore-leg 22.6-26.0 (24.4).

Nasals narrowly separated (occasionally in short contact). Prefrontals widely separated. Frontoparietals moderately to very narrowly separated, much smaller than interparietal; in one specimen they are fused to parietals. Nuchals 1-4 (2.7). Supraoculars normally 3, first two in contact with frontal (first two fused in Ajana specimen, and last two fused on one side of 28944). Supraciliaries normally 1 + 3 (1 + 2 in 25200, 5 on one side of 28944). Upper labials normally 6 (5 in two specimens owing to fusion of third and fourth). Upper secondary temporal much the largest, lower secondary much the smallest. Midbody scale-rows 20 (rarely 22). Lamellae under longest toe 9-13 (11.5).

Dorsally purplish grey (fading in alcohol to purplish brown) without pattern except for slight darkening in loreo-orbital region. Lips and ventrolateral and ventral surfaces whitish, boundary between upper and lower coloration more or less sharp.

Geographic variation. Specimens from the far west (Kalbarri, Ajana and Yuna) have only two toes; and at Ajana and Yuna fingers are reduced to one.

Material. **North-West Division (W.A.)**: Landor (2708); 47 mi. W of Cue (28944); Meka (29723). **South-West Division (W.A.)**: 14 mi. ESE of Kalbarri (33800); Ajana (25220); 28 mi. NE of Yuna (26505); Ballidu (13931 a - b); Wialki (18187, 24881); Mukinbudin (32048); Bencubbin (2759); Wongan Hills (4237); Ejanding (9833); Nembudding (7393); Kununoppin (22343); Nukarni (4991); North Baandee (26159); Bruce Rock (1113); Narembeen (4167, 12371); 40 mi. E of Narembeen (25827); "Claremont" (10316); "Perth" (1007). **Eastern Division (W.A.)**: 16 mi. S of Atley (ERP 13202, 13632); Jeedamya (24043).

Lerista desertorum

Lygosoma (Rhodona) planiventrale desertorum Sternfeld, 1919, Senckenbergiana 1 : 82. Hermannsburg, Northern Territory (M. von Leonhardi).

Diagnosis. Large species with digits 2 + 3, movable eyelid, and frontoparietals paired; distinguishable from *L. macropisthopus* by dark dorsal lines and upper lateral stripe, and from *L. p. picturata* by separated nasals and 2 (rather than 4) dorsal lines.

Distribution. Southeastern interior of Western Australia, north to Lake Wells and the Rawlinson Range, west to Albion Downs, Agnew and Glenorn, and south to the Trans-Australian Railway; southwest of Northern Territory north to Hermannsburg and east to Kulgera.

Description. Snout-vent length (mm) 39-93 (77.4). Length of appendages &c. (% SVL): fore-leg 2.1-5.8 (4.0); hind-leg 13.0-18.9 (15.5); tail 104-119 (109.7); snout to fore-leg 22.1-28.7 (24.5).

Nasals moderately to narrowly separated. Prefrontals very widely separated. Frontoparietals usually moderately to very narrowly separated, occasionally in short contact, much smaller than interparietal. Nuchals 1-4 (2.6). Supraoculars 3, first two in contact with frontal. Supraciliaries usually 0 + 3; rarely 3, 0 + 2, 1 + 1, 1 + 2 or 1 + 3. Upper labials 6. Upper secondary temporal much the largest, lower secondary much the smallest. Midbody scale-rows usually 20, occasionally 21 or 22. Lamellae under longest toe 10-13 (11.5).

Dorsally greyish fawn, marked with blackish brown as follows: line of dots through centre of each series of paravertebral scales from neck to about proximal quarter of tail; stripe from nasal or loreals through orbit to base of tail, 1-1½ scales wide on body; scales on remainder of tail each with a transversely elongate spot; small blotches on head. Limbs greyish brown. Lips and ventrolateral and ventral surfaces whitish except for dark-brown dots under tail and greyish-brown soles and toes.

Remarks. This lizard is so similar in scutation to *macropisthopus* that it could well be conspecific with it. At Jeedamya and Glenorn the two forms are separated by only 30 miles.

Material. **Eastern Division (W.A.)**: 3 mi. N of Giles (34155); Barrow Range (20724, 20726); Warburton Range (15146, 15176, 18224, 22000, 22060, 22089-90); Lake Wells (1607); Albion Downs (8787, 30596, 30963); Kathleen Valley (16903, 19776, 27229); 10 mi. NW of Agnew (ERP 10980); Lake Throssell (15709); 5 mi. NE of Dunges Table (ERP 12197); White Cliffs (20662); Mt. Morgans (25953); Murrin Murrin (ERP 10456); Glenorn (3785); 19 mi. W of Randells (12228). **Northern Territory**: Armstrong Creek (JSE); Kulgera (24472).

Lerista picturata picturata

Lygosoma (Rhodona) picturatum Fry, 1914, Rec. W. Aust. Mus. 1 : 186. Boulder, Western Australia (W. D. Campbell).

Diagnosis. *L. picturata* is a large species with digits 2 (or fewer) + 2, movable eyelid, nasals forming median suture, frontoparietals paired, and enlarged second supraocular excluding or nearly excluding first from contact with frontal.

Distribution. Southern interior of Western Australia from Kalgoorlie and Norseman east to Zanthus and Balladonia.

Description. Fingers 2 (first minute), 1 or 0 (fore-limb reduced to style); toes 2. Snout-vent length (mm) 68-92 (81.1). Length of appendages &c. (% SVL): fore-leg 0.8-1.7 (1.3); hind-leg 14.7-18.9 (16.3); tail 97 (1 specimen); snout to fore-leg 24.1-25.7 (24.8).

Nasals in short to long contact. Prefrontals widely separated. Frontoparietals separated, much smaller than interparietal. Nuchals 2-5 (3.6) Supraoculars 3, second always and first sometimes in contact with frontal. Supraciliaries usually 0 + 2, occasionally 0 +1 or 0 + 3. Upper labials 6. Upper secondary temporal largest, lower secondary much the smallest. Midbody scale-rows usually 20, occasionally 22. Lamellae under longer toe 13-15 (13.5).

Dorsally pale fawn with following dark-brown markings: 4 dorsal lines from neck to middle of tail (on which they break up into series of dots), blotches on head, and stripe from lores through orbit to base of tail. Lips and ventrolateral and ventral surfaces whitish.

Material. **Eastern Division (W.A.)**: 3 mi. SW of Boulder (22513); Grants Patch (10147); 19 mi. W of Randells (12229); Zanthus (12227); 56 mi. SSE of Karonic (17340). **Eucla Division (W.A.)**: Norseman (8152); 29 mi. N of Balladonia Hotel (29473). **Locality uncertain**: 163 (no data); 4165 ("Mullewa"); 26325 ("Greenough").

Lerista picturata baynesi subsp. nov.

Holotype. R 24609 in Western Australian Museum, an adult collected by G. M. Storr and A. M. Douglas on 7 October 1964 at Eucla, Western Australia, in 31° 43′S, 128° 53E′

Diagnosis. Distinguishable from *L. p. picturata* by weaker limbs, more elongate body, greyer coloration and reduced pattern.

Distribution. Southeast of Western Australia: shores of Great Australian Bight from Twilight Cove east to Eucla and inland to Hampton Tableland.

Description. Finger 1 or 0 (i.e. fore-limb stylar); toes 2 (first minute), occasionally only one. Snout-vent length (mm) 64-83 (76.2). Length of appendages &c. (% SVL): fore-leg 0.5-1.4 (1.2); hind-leg 11.1-13.6 (12.2); tail 48-84 (70.3); snout to fore-leg 21.9-23.9 (23.0).

Nasals forming median suture (very narrowly separated in one specimen). Prefrontals widely separated. Frontoparietals moderately to narrowly separated, much smaller than interparietal. Nuchals 3-5 (4.3). Supraoculars 3, second always and first occasionally in contact with frontal. Supraciliaries 0 + 1 or 0 + 2. Upper labials 6. Primary temporal usually a little larger than upper secondary; lower secondary much the smallest. Midbody scale rows 18 or 20. Lamellae under longer toe 8-10 (9.0).

Dorsally pale brownish-grey. Dorsal lines indistinct or absent. Narrow indistinct stripe from nasal through orbit to base of tail, grey flecked with blackish. Ventrolateral and ventral surfaces whitish except for dark grey under toes.

Geographic variation. The colour pattern is more strongly developed in the west than in the east. The specimens from Madura and Twilight Cove alone have dorsal lines and their upper lateral stripe is fairly distinct; they thus form a link between nominate *picturata* and topotypical *baynesi*.

Remarks. Named after mammalogist Alexander Baynes who collected many reptiles for this Museum during his field-work in Western Australia.

Paratypes. **Eucla Division (W.A.)**: Twilight Cove (28705); top of Madura Pass (28128); 27 mi. S of Madura (34445); Eucla (24610-17; ERP 13719, 13772); Eucla Pass (18188).

Lerista gerrardii

Rhodona punctata var. *gerrardii* Gray, 1864, Proc. Zool. Soc. Lond., p. 296. Swan River (E. Gerrard).

Diagnosis. Large species with digits 1 + 2 (finger sometimes reduced to style; rarely 2 fingers), movable eyelid, frontoparietals paired, and dark vertebral stripe.

Distribution. Southwestern interior of Western Australia from Northampton and Dalgaranga (*fide* Loveridge 1934 : 371) south to Mogumber, Merredin and Southern Cross.

Description. Snout-vent length (mm) 41-86.5 (75.6). Length of appendages &c. (% SVL: fore-leg 1.6-4.4 (3.2); hind-leg 12.4-16.7 (14.3); tail 89-109 (99.1); snout to fore-leg 22.2-27.8 (23.8).

Nasals narrowly separated (rarely in short contact). Prefrontals widely separated. Frontoparietals separated (usually narrowly), smaller than interparietal. Nuchals 2-4 (2.9). Supraoculars normally 3, first two in contact with frontal. Supraciliaries usually 0 + 3 or 1 + 3, occasionally 5, 4, 2 + 1, 1 + 2 or 0 + 2. Upper labials 6. Upper secondary temporal much the largest, lower secondary much the smallest. Midbody scale-rows 20. Lamellae under longer toe 10-12 (11.0).

Dorsally pale brown, becoming dark greyish-brown on snout and tail. Blackish-brown vertebral stripe from occiput to base of tail, whence it continues as two series of paravertebral spots. Blackish-brown stripe from nasal through orbit to proximal quarter of tail, after which it becomes broken and indistinct. Remaining surfaces whitish.

Geographic variation. From southeast to northwest there is a cline in increasing length of finger; and it is only in the far northwest that a specimen has been collected with two fingers on each fore-leg.

Material. **South-West Division (W.A.)**: Northampton (176, 25960, 31973-4); East Chapman (4430); Geraldton (8597); Newmarracarra (1728-9); Mingenew (34103); Perenjori (943); Coorow (6941); Maya (27914); 8 mi. NE of Jibberding White Well (28263); Wubin (11004); Mogumber (3847); Merredin (7351); Southern Cross (34577); "North Perth" (4841).

Lerista lineopunctulata

Rhodona punctata Gray, 1839, Ann. Nat. Hist. 2 : 335. New Holland. [Not Lygosoma punctatum (Linnaeus) of Boulenger (1887 : 310).]

Brachystopus lineo-punctulatus Duméril & Bibron, 1839, "Erpétologie générale" 5 : 779. "Cape of Good Hope" (A. Smith).

Ronia catenulata Gray, 1841, Ann. Mag. Nat. Hist. 7 : 87. Western Australia (J. Gould).

Soridia miopus Günther, 1867, Ann. Mag. Nat. Hist. (3) 20 : 49. Champion Bay, Western Australia (F. H. Duboulay).

Lygosoma (Rhodona) bipes var *concolor* Werner, *1910*, "Fauna Südwest-Australiens" 2 : 483. Denham, Western Australia (W. Michaelsen & R. Hartmeyer).

Lygosoma (Rhodona) nigriceps Glauert, 1962, W. Aust. Nat. 8 : 86. Vlaming Head, North-West Cape, Western Australia (Mrs Thomas).

Diagnosis. Large species with digits 0 + 1 or 2, movable eyelid, prefrontals present, frontoparietals and interparietal fused, and no dark upper lateral stripe.

Distribution. West coast of Western Australia from North-West Cape south to the Swan River, inland to Yuna, Perenjori, Moora and Darlington; Bernier Island (Shark Bay); West Wallabi Island (Houtman Abrolhos); Long and Middle Islands (Jurien Bay).

Description. Fore-limb a style or tubercle or absent, but groove always present. Snout-vent length (mm) 36-103 (80.8). Length of appendages &c. (% SVL): fore-leg 0-1.3 (0.6); hind-leg 6.1-17.3 (8.9); tail 73-96 (85.3); snout to fore-leg 18.9-27.2 (22.3).

Nasals in contact. Prefrontals widely separated. Frontoparietals and interparietal fused into single shield. Nuchals 0-3 (1.9). Supraoculars usually 3, first two in contact with frontal. Supraciliaries usually 5, occasionally 4. Upper labials 6. Upper secondary temporal much the largest, lower secondary much the smallest. Midbody scale-rows 20 (rarely 18 or 22). Lamellae under longer toe 4-11 (7.4).

Dorsally pale brownish or greyish with pattern varying geographically (see below). No dark upper lateral stripe. Lips vertically barred with dark brown. Lower surfaces whitish.

Geographic variation. Dorsal coloration, development of limbs and number of nuchals vary geographically.

In the south, each dorsal and upper lateral scale usually bears a narrow longitudinally-orientated blackish-brown bar resulting in a total of six broken lines; but there is much individual variation—some specimens are almost unspotted;

others have many more series of spots; and in some the spots are squarish in shape or transversely elongate. In the north (*"nigriceps"*) there are no spots, and the head is dark greyish-brown. In the central region (*"miopus"*) the coloration of northern and southern types are variously combined, though the head is seldom as dark as in the north or the back so spotted as in the south.

Southern specimens usually have a stylar fore-limb and didactyl hind-limb. In the far north there is no trace of a fore-leg and the hind-leg is monodactyl. Specimens from the intervening region are variously intermediate (and moreover there is no concord between limb development and colour type).

From south to north, relative length of tail and of snout to fore-leg decrease, and the number of nuchals increases.

Material. **North-West Division (W.A.)**: North West Cape (31273); Vlaming Head (14039, 19669, 22054); 20 mi. S of Point Cloates (13214); Carnarvon (4755-6); Bernier Island (10656, 20506-7); Cape Peron (33373); Denham (19683); Useless Loop 26725); Tamala (18598). **South-West Division W.A.**: West Wallabi Island (22962); 19 mi. N of Murchison House (34041); Kalbarri (31084, 33535); Northampton (8530); Wonthella (14152); 20 mi. NE of Yuna (26500); Eradu (5063); Denison (19858); Perenjori (29281); Jurien Bay (18194, 30481); Jurien Bay Islands (18189-93); Moora (7607); Gingin (3786); Bullsbrook East (29776); Darlington (214); 27 specimens from Perth and suburbs (from Scarborough and Mt. Lawley south to Cottesloe and Victoria Park).

Lerista nichollsi

Rhodona nichollsi Loveridge, 1933, Occ. Pap. Boston Soc. Nat. Hist. 8 : 97. Dalgaranga, Western Australia (G. E. Nicholls).

Diagnosis. Medium-sized species with digits 0 + 2, eyelid fixed, and frontoparietals and interparietal fused; distinguishable from *bipes* and *labialis* by presence of prefrontals, vertebral stripe and fore-limb groove.

Distribution. Mid-western interior of Western Australia from the Gascoyne south to the lower Murchison and upper Greenough, east to Milcura and Dalgaranga.

Description. Fore-limb tubercular or absent. Eyelid fixed. Snout-vent length (mm) 31-61 (50.9). Length of appendages &c. (% SVL): hind-leg 13.8-20.2 (17.3); tail 78-99 (91.2); snout to fore-limb groove 21.6-25.6 (23.0).

Nasals in short to moderately long contact. Prefrontals widely separated (absent in 18198). Nuchals 2 or 3 (2.3). Supraoculars 3, first two in contact with frontal. Supraciliaries 0 + 1, 0 + 2, 1 + 2, 3 or 4. Upper labials 6. Upper secondary temporal much the largest, lower secondary much the smallest. Midbody scale-rows 20 (rarely 18). Lamellae under longer toe 9-15 (11.4).

Dorsally very pale grey or brown, sometimes almost white. Vertebral stripe from nape nearly to end of tail, consisting of two series of dark brown paravertebral dots with space between them filled in with dark or pale brown. Dark brown stripe from nasal or loreals through orbit nearly to end of tail. Ventrolateral and ventral surfaces whitish.

Material. **North-West Division (W.A.)**: Booloogooroo (31274); 14 mi. S of Booloogooroo (16950); Wooramel (18198, 19932); Coordewandy (28386); Mileura (13477, 15808); Woolecn (4455); Yallalong (1262); Meka (29272). **South-West Division (W.A.)**: Gic Gie Outcamp, 21 mi. NNW of Murchison House (34046); 1 mi. SE of Kalbarri (37640-1); Wandina (9058).

Lerista connivens sp. nov.

Holotype. R 25777 in Western Australian Museum, collected by G. M. Storr on 30 August 1965 on Salutation Island, Western Australia, in 26° 32′S, 113° 46′E.

Diagnosis. Distinguishable from *nichollsi* by movable eyelid and greater size.

Distribution. Mid-west coast of Western Australia: islands of Freycinet Estuary, Shark Bay; and on the mainland at Kalbarri (mouth of the Murchison).

Description. Usually no trace of fore-limb, rarely a tubercle. Snout-vent length (mm) 65-80 (72.3). Length of appendages &c. (% SVL): hind-leg 12.6-15.2 (13.7); snout to fore-limb groove 21.5-23.4 (22.5).

Nasals in moderately long contact. Prefrontals widely separated. Frontoparietals and interparietal fused into single shield. Nuchals 0-2 (1.3). Supraoculars 3, first two in contact with frontal. Supraciliaries 3 or 4. Upper labials 6. Upper secondary temporal much the largest, lower secondary much the smallest. Midbody scale-rows 20 or 22. Lamellae under longer toe 9-12 (10.3).

Dorsally white or greyish-white, marked as in *nichollsi* except for vertebral stripe usually wider and more ragged-edged.

Paratypes. **North-West Division (W.A.)**: Freycinet Island (25811); Mary Anne Island (middle islet 25762-4, south islet 25759-61); Salutation Island (25776); Three Bays Island (25750-2). **South-West Division (W.A.)**: Kalbarri (34317).

Lerista bipes

Rhodona bipes Fischer, 1882, Arch. Naturgesch. 48 : 292. Nickol Bay, Western Australia.

Diagnosis. Small slender species with digits 0 + 2, moveable eyelid, and frontoparietals and interparietal fused; distinguishable from *L. nichollsi* by absence of prefrontals and of all trace of fore-limbs (including groove), and from *L. labialis* by presence of supraciliaries and of two supraoculars in contact with frontal.

Distribution. Western Australia, south in the west to the Tropic and in the east to Laverton and Lake Ell; also on Depuch, Hermite and Barrow Islands. Northern Territory north to Elliott. Far northwest of South Australia.

Description. Snout depressed, very sharp in profile, extending well beyond mouth. Snout-vent length (mm) 26-67 (49.9). Length of appendages (% SVL): hind-leg 12.9-21.8 (16.8); tail 67-106 (85.1).

Nasals narrowly separated (occasionally just touching, very rarely in short contact or widely separated). No prefrontals (small one on one side of 29456). Nuchals 0-4 (2.1). Supraoculars 3 (locally 2). Supraciliaries 0 + 1 or 2. Upper labials 5 (locally 6). Primary and upper secondary temporals subequal, lower secondary much the smallest. Midbody scale-rows 18 (locally 20). Lamellae under longer toe 7-12 (9.3).

Dorsally pale reddish-brown. Usually a line of brown dots through centre of paravertebral scales from nape nearly to end of tail; less frequently an additional but fainter series of dorsal dots. Dark-brown stripe from nasal through orbit nearly to end of tail. Lips and lower surfaces whitish.

Geographic variation. The most distinctive populations are those from the Kimberley Division. They are characterised by large size (including the only specimens whose snout-vent length exceeds 62 mm) and high number of midbody scale-rows (20 everywhere except in south-west, where 18 is frequent at Broome and the only count at Lagrange). All specimens from near Derby (and also the single specimen from Dunham River) are additionally peculiar in having 6 upper labials. The northeast Kimberley specimens are relatively dark, and their well-defined dorsal lines extend on to the occiput.

Specimens from the north-west coast are apt to be very pale and to have little indication of dorsal pattern. They are also notable for their shorter-than-average hind-legs and the relatively high frequency of contiguous nasals. All ten specimens from Depuch Island have only two supraoculars, a trait shared with some mainland speciments, *viz.* those from De Grey and Wallal and one of the four specimens from Lagrange; this reduction is due to fusion of the second and third supraoculars, not the first and second as in *labialis*.

The populations from the Northern Territory and the interior of Western Australia are all very similar. On average the ground colour is darker, the dorsal pattern stronger, and the number of nuchals and subdigital lamellae greater than in west Kimberley and along the north-west coast.

Remarks. Wherever Kimberley specimens diverge from normal, it is generally in the direction of *labialis*. This, however, does not necessarily imply a direct relationship; it could well be due to the independent retention of ancestral characters.

Material. **Kimberley Division (W.A.)**: Ninbing (27913); Point Springs, Weaber Range (26774); 11 mi. ENE of Kimberley Research Station (17105); 13 and 23 mi. SE of Kununurra (23108, 23113); 14 mi. N of Dunham River HS. (23080); Derby (20295-6, 20333-7); 5 and 14 mi. S of Derby (23005, 18210); Broome (1256-7, 13565, 14112, 27909, 29159); Lagrange (3440, 3448-9, 31269). **North-West Division (W.A.)**: Wallal (7598); De Grey (2125); Muccan (10896); Mt. Edgar (18206-9); Woodstock (31272); Jiggalong (13342, 13358, 18204, 25116); Mundabullangana (18205); Depuch Island (14564-73); Roebourne (12125); Hermite Island (28683, 31267-8); Barrow Island (28677-82, 27910-2, 31258-65); North-West Cape (22505); Vlaming Head (19670); Yardie Creek (13213, 31270-1); Marrilla (5647); Lyndon (10486). **Eastern Division (W.A.)**: Well 39, Canning Stock Route (3980); Well 37, C.S.R. (3972); Kidson Camp (26940-1); Well 23, C.S.R. (27056); Well 24, C.S.R. (27024); Windy Corner (27003); Windich Spring (3896); 9 mi. E of Mt. Nossiter (26888); 4 mi. NW of Mt. Aloysius (20972); Warburton Range and 5 mi. NNW (14648-52, 15159, 15177-8, 17849-53, 18199-201, 21202-5, 22061-2, 22091-4, 22102, 22203); Winduldarra Soak (18202); 88 mi. E of Cosmo Newberry (18203); 22 mi. W of Yamarna (20680); White Cliffs (20661); Cosmo Newberry (13856); 25 mi. NE of Laverton (31266); Elduna, near Lake Ell (29456). **Northern Territory**: Elliott (24190); 26 mi. SW of Wauchope (24318-20); 28 mi. NE of Barrow Creek (24341-7); Kintore Range (JSE 278 a-b); east of Bonython Range, 23° 42′S, 129° 02′E (JSE 191); Armstrong Creek (JSE 89, 112); Curtin Springs (JSE 24b, 27b, 42c, 48a-b). **South Australia**: 40 mi. NW of Mt. Lindsay, Birksgate Range (31725).

Lerista labialis sp. nov.

Holotype. R 22647 in Western Australian Museum, collected by W. H. Butler and A. M. Douglas on 14 July 1964 at Poonda, Western Australia, in 22° 53′S, 119° 42′E.

Diagnosis. Small, slender species with digits 0 + 2, movable eyelid, frontoparietals and interparietal fused, and no fore-limb groove. Distinguishable from *L. bipes* by having only one supraocular in contact with frontal and no supraciliaries. Most populations of *labialis* further distinguishable from most populations of *bipes* by having 6 upper labials (against 5), 20 midbody scale-rows (against 18), and 2 supraoculars (against 3).

Distribution. Northern Territory north nearly to Banka Banka. South Australia south to the Gawler Range. Western Australia in the upper and middle parts of the valley of the Fortescue River, on the Houtman Abrolhos, and in the far southeastern interior near Lake Ell.

Description. Snout depressed, very sharp in profile, extending well beyond mouth. Snout-vent length (mm: 32-60 (53.1). Length of appendages (% SVL): hind-leg 14.0-18.2 (16.3); tail 71-97 (85.8).

Nasals separated. No prefrontals. Frontoparietals fused to each other and to interparietal. Nuchals 0-3. Supraoculars 2, first much the larger and alone in contact with frontal. No supraciliaries. Upper labials 6 (rarely 5). Upper secondary temporal usually a little larger than primary, lower secondary much the smallest. Midbody scale-rows 20 (locally 18 or 19). Lamellae under longer toe 8-12 (9.7).

Dorsally pale reddish-brown with two lines of dark brown dots running through centre of each paravertebral series. Broad dark brown stripe from nostril, back through orbit, nearly to end of tail. Ventral surfaces whitish.

Remarks. The taxonomic status of this form is uncertain. Apart from the isolated Fortescue population, *labialis* generally occurs to the east and southeast of *bipes;* and it tends to occupy heavier soils, whereas *bipes* alone has been found in sand dune country. At Curtin Springs (in the south of the Northern Territory) and near Lake Ell (in the southeastern interior of Western Australia), where these two kinds of country meet, both forms have been collected. Because of this sympatry, it would seem that *labialis* has attained specific distinctness. Elsewhere, however, there is evidence of extensive hybridization at the boundary of the two forms.

Our single specimen from Elliot (24190) has the supraoculars and supraciliaries on one side of the head as in *bipes* and on the other side as in *labialis,* which indicates that the nature of the supraoculars and supraciliaries should be regarded as a single character, i.e. first and second supraoculars and supraciliaries fused to each other or free. The Elliot specimen is identified with *bipes* because of its 18 midbody scale-rows and 5 upper labials. Further south, near Banka Banka, all five specimens have 18 scale-rows but in other respects agree with *labialis.* Likewise at its western limits in the Northern Territory (Chernside River) and South Australia (Serpentine Lakes), *labialis* may have 18 or 19 scale-rows; furthermore one of the three specimens from the Chernside has an additional *bipes* character, viz. 3 supraoculars.

Paratypes. **Western Australia:** Hooley (10820); Poonda, 28 mi. SW of Roy Hill (22643-6, 31275-9); Wallabi Group, Houtman Abrolhos (188); Elduna, near Lake Ell (29455). **Northern Territory:** 7 mi. S of Banka Banka (24219-23); 26 mi. SW of Barrow Creek (24371-2); Mt Esther (24382); 8 mi. S of Teatree (24402); 17 mi. S of Teatree (24403-4); Palm Valley (20864); Chernside River (20774-6); Mt Olga (JSE 68); Curtin Springs (20812-4; JSE 14, 24a, 27a, 42a-b, 48c); Victory Downs (20921-4); Kulgera (20914). **South Australia:** 35 mi. E of Serpentine Lakes (34530); 14 mi. N of Sundown (24481); Ingomar (24491); 13 mi. SE of Kokatha (24510).

Lerista humphriesi sp. nov.

Holotype. R 34048, a gravid female in Western Australian Museum, collected by the Hale School Expedition on 27 December 1968 at Gee Gic Outcamp, 21 miles NNW of Murchison House, Western Australia, in 27° 21′S, 114° 09′E.

Diagnosis. Small slender species with digits 0 + 0, movable eyelid, no prefrontals, frontoparietals and interparietal fused, and secondary temporals fused. Further distinguishable from *bipes* and *labialis* by small stylar hind-limb, 16 scale-rows and contiguous nasals; and from *praepedita* by two loreals (not one), a supraciliary (rather than none) and 6 labials (rather than 5).

Distribution. Mid-western Western Australia, near the mouth of the Murchison.

Description (of holotype, the only known specimen). Snout depressed, very sharp in profile, extending well beyond mouth. No trace of fore-limb (including groove). Hind-limb stylar. Snout-vent length (mm) 57. Length of hind-leg (% SVL) 2.2.

Nasals forming a short median suture. Nuchals 2 or 3. Supraoculars 3, first 2 in contact with frontal. Supraciliaries 0 + 1. Upper labials 6. Temporals 2, secondary much larger than primary. Midbody scale-rows 16.

Ground colour brownish white, marked with dark brown as follows. Line through middle of each series of paravertebral scales. Line of dots through next series of scales (laterodorsal), anteriorly continuous, but soon breaking up into a series of dots increasingly widely separated, finally becoming a series of faint, transversely orientated crescents. Broad upper lateral stripe extending narrowly forward through orbit to lores, confluent with vertical bars on posterior edge of first three upper labials. Three ventrolateral series of dots beginning behind ear aperture: uppermost soon developing into a continuous line; central soon changing into a series of vertically orientated crescents; and lowest soon disappearing but reappearing on posterior half of the body as a series of crescents smaller than those of central series. Top of head dotted and flecked with brown. Under surfaces whitish.

Remarks. Named after Robert B. Humphries, who as field-leader of Hale School expeditions and on other occasions has contributed many reptiles to the collections of the Western Australian Museum.

Lerista praepedita

Soridia lineata Gray, 1839, Ann. Nat. Hist. 2 : 336. Australasia. [Not *Lygosoma lineatum* (Gray) of Boulenger (1887 : 316) or *Lerista lineata* Bell.]

Praepeditus lineatus Duméril & Bibron, 1839, "Erpétologie générale" 5 : 788. "Cape of Good Hope" (A. Smith).

Pholeophilus capensis Smith, 1849, "Illustrations Zoology South Africa", Reptilia, app., p. 15. [Nomen oblitum.]

Lygosoma praepeditum Boulenger, 1877, "Cat. Liz. Brit. Mus." 3 : 337. Western Australia.

Diagnosis. Small, very slender species with digits 0 + 0, movable eyelid, no prefrontals, and frontoparietals and interparietal normally fused. Further distinguishable from *bipes, labialis* and *humphriesi* by single loreal and dark venter.

Distribution. West coast of Western Australia from Carnarvon south to Mandurah, inland to Eradu, Gingin and Guildford; also on Shark Bay islands (Bernier and Salutation), Houtman Abrolhos (North, East and West Wallabi, and Middle Islands), and Rottnest and Garden Islands.

Description. No trace of fore-limb (including groove). Hind-limb stylar. Snout-vent length (mm) 33-65 (54.8). Length of appendages (% SVL): hind-leg 1.5-3.2 (2.1); tail 63-93 (79.8).

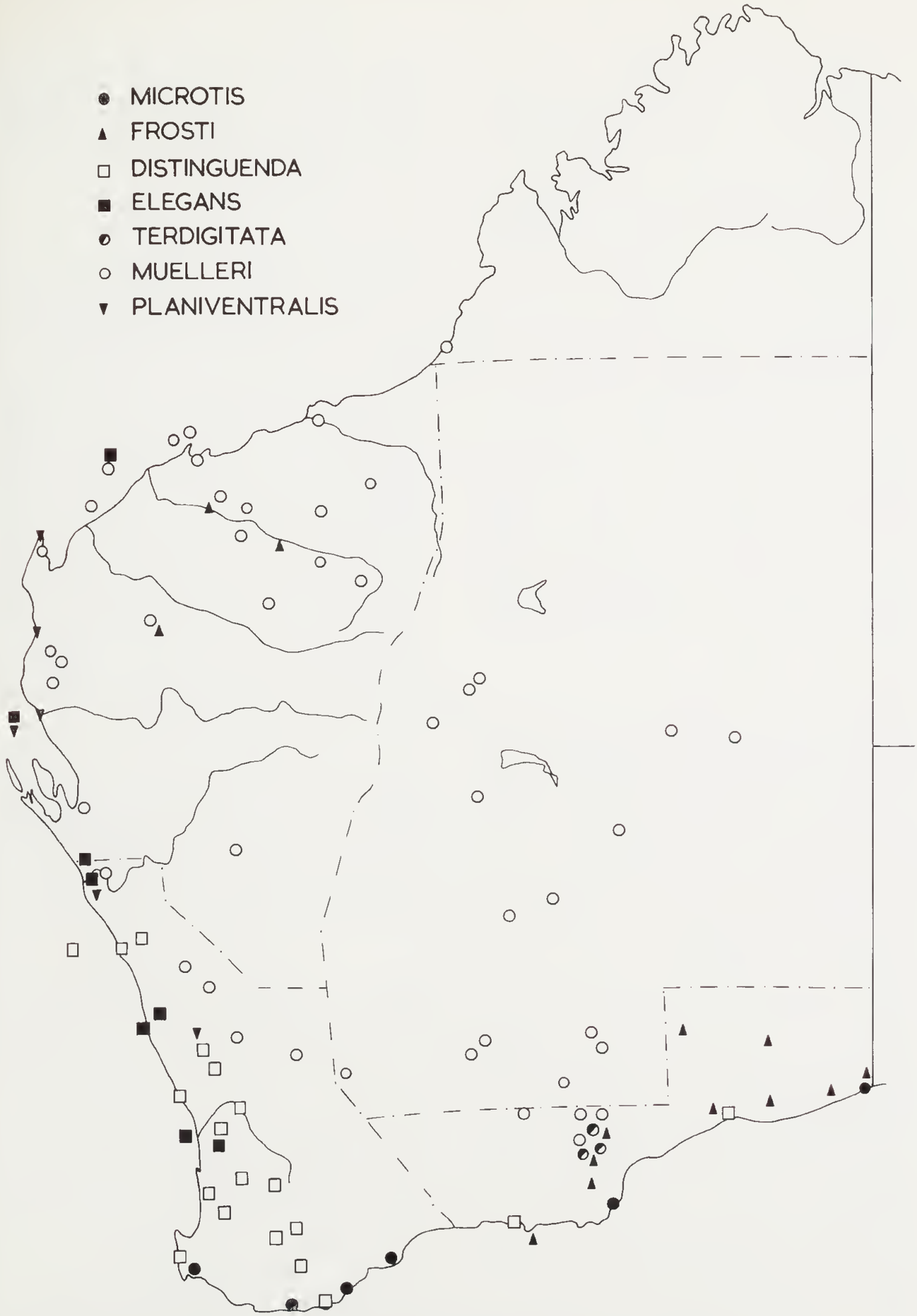

Figure 1.—Map of Western Australia showing location of specimens of *Lerista elegans* species-group and of *L. planiventralis*.

Nasals in short to moderately long contact. Frontoparietals and interparietal usually fused (occasionally frontoparietals free, very widely separated and very much smaller than interparietal). Nuchals 1-4 (2.8). Supraoculars usually 2, both in contact with frontal; occasionally 3 (especially in north) with first two (rarely all three) in contact with frontal. No supraciliaries. Upper labials 5. Upper secondary temporal much the largest, lower secondary much the smallest. Midbody scale-rows 16 (rarely 14 or 17).

Dorsally very pale olive-grey with two series of blackish-brown dots, each located on mid-anterior edge of a paravertebral scale. Blackish-brown stripe from nasal through orbit to end of tail, ill-defined on head. Ventrolaterals, ventrals and subcaudals greyish white, anteriorly edged with blackish brown. Enlarged preanals whitish, contrasting with dark adjacent scales.

Material. **North-West Division (W.A.)**: Carnarvon (4754); Bernier Island (13216, 20508-11); Salutation Island (25775). **South West Division (W.A)**: North Island (18222-3); East Wallabi Island (18221); Middle Island (27187); Eradu (5065-6); Dongara (12069-70); Gingin (34110); Gnangara (34264-5); Wanneroo (31459); 46 specimens from Perth and suburbs (from Scarborough, Tuart Hill and Guildford, south to Mosman Park, Nedlands and Bayswater); Rottnest Island (2730, 15200, 18219-20, 29890, 29905); Garden Island (28470, 32366); West Murray (2904); "York" (7331).

Discussion

Like *Ctenotus*, the genus *Lerista* is rich in species and state-wide in distribution; but there the resemblance ends. *Ctenotus* species are mainly active foragers in the open spaces between cover, and are best represented in arid country. They range in size and habitus from *C. ocellifer* and *grandis*, species much resembling the skinks of the *Egernia whitii* group, down to small litter-inhabiting forms like *C. schomburgkii* which in their morphology and way of life are not unlike members of such cryptozoic genera as *Carlia*, *Leiolopisma* and *Morethia*.

Lerista, from the adaptive viewpoint, could be said to begin where *Ctenotus* leaves off. Its most generalised species, *L. microtis*, with pentadactyl limbs, 4 supraoculars, 6 supraciliaries, 7 upper labials, large frontoparietals, dark ground coloration and moderately well-developed pattern of dark and pale stripes, is superficially similar to the small litter-inhabiting skinks of various other genera. At the other end of the adaptive scale in *Lerista* is *L. praepedita*, a pale fossorial species with no trace of a fore-limb, the hind-limb reduced to a clawless style, only 2 supraoculars, 5 upper labials, 1 loreal, no supraciliaries and prefrontals, and frontoparietals and interparietal usually fused into a single shield.

The various morphological changes associated with adaptive shift from active foraging in litter to a more fossorial way of life are only partially correlated with each other. That is to say, a given species of *Lerista* may be more generalised or primitive in some characters, more specialised in others. And instead of a continuum in adaptation, we tend to have species clustering about discrete levels of specialisation. This phenomenon permits a division of the genus into species-groups.

Elegans group

Composition: *L. microtis, frosti, distinguenda, elegans, terdigitata* and *muelleri*.

Diagnosis: Small *Lerista* with fore-limbs about half as long as hind-limbs; fingers 3-5, equal in number to toes; frontoparietals forming a median suture; dorsum usually olive in colour; dark upper lateral stripe and white midlateral stripe usually present.

Remarks: These skinks are shade-loving inhabitants of leaf-litter. Most, if not all, of them are diurnal and freely expose themselves when foraging. They are best represented in the cooler and more humid parts of the State (Fig. 1). One species, *muelleri*, ranges widely in arid (but not desert) regions. Another species, *frosti*, is predominantly southern but has relictual populations in northern oases.

In the sequence *microtis-muelleri* there is a steady progression in the elongation of the body, the shortening of limbs, loss of digits, and fusion of head shields. The smallest species, viz. *distinguenda, elegans* and *muelleri*, have acquired an ablepharine eye (i.e. the lower eyelid is immovable and entirely transparent), a condition for which there is evidently strong selection-pressure in litter-inhabiting skinks whose snout-vent length averages less than 40 mm.

Lineata group

Remarks: This group consists only of *L. lineata*, a species that is close to extinction, judging from its very restricted, mainly insular distribution. It differs from the *elegans* group in (1) reduction of fore-leg (much less than half as long as hind-leg, and bearing fewer digits), (2) snout slightly protrusive, and (3) lack of olive tone in dorsal coloration. It thus shows some tendency towards the fossorial groups described below.

Planiventralis group

Remarks: The single species is very peculiar and has no close relatives. The function of the flange along the ventrolateral angle of the body is unknown; perhaps it aids the lizard in some way to penetrate fissures between layers of limestone. The depression, prolongation and sharpness of the snout are as well developed as in the *bipes* group, and the fusion of the secondary temporals is elsewhere found only in the highly fossorial *L. humphriesi*. In other respects it is not so specialised, e.g. elongation of body, relative length of hind-leg, and the condition of the frontoparietals are much the same as in the *elegans* group.

Macropisthopus group

Composition: *L. neander, macropisthopus, desertorum, picturata* and *gerrardi*.

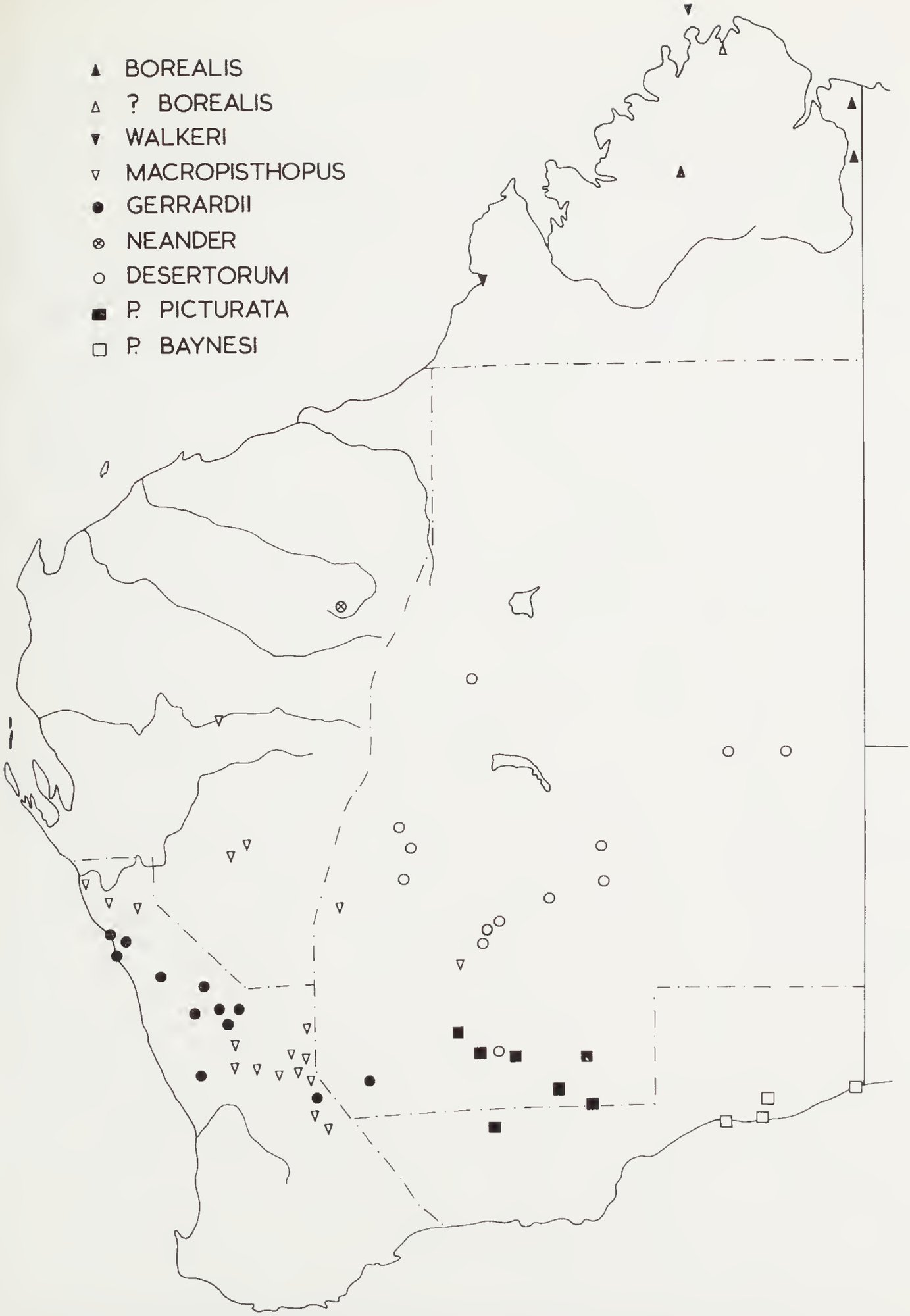

Figure 2.—Map of Western Australia showing location of specimens of *Lerista borealis*, *L. walkeri* and the *L. macropisthopus* species-group.

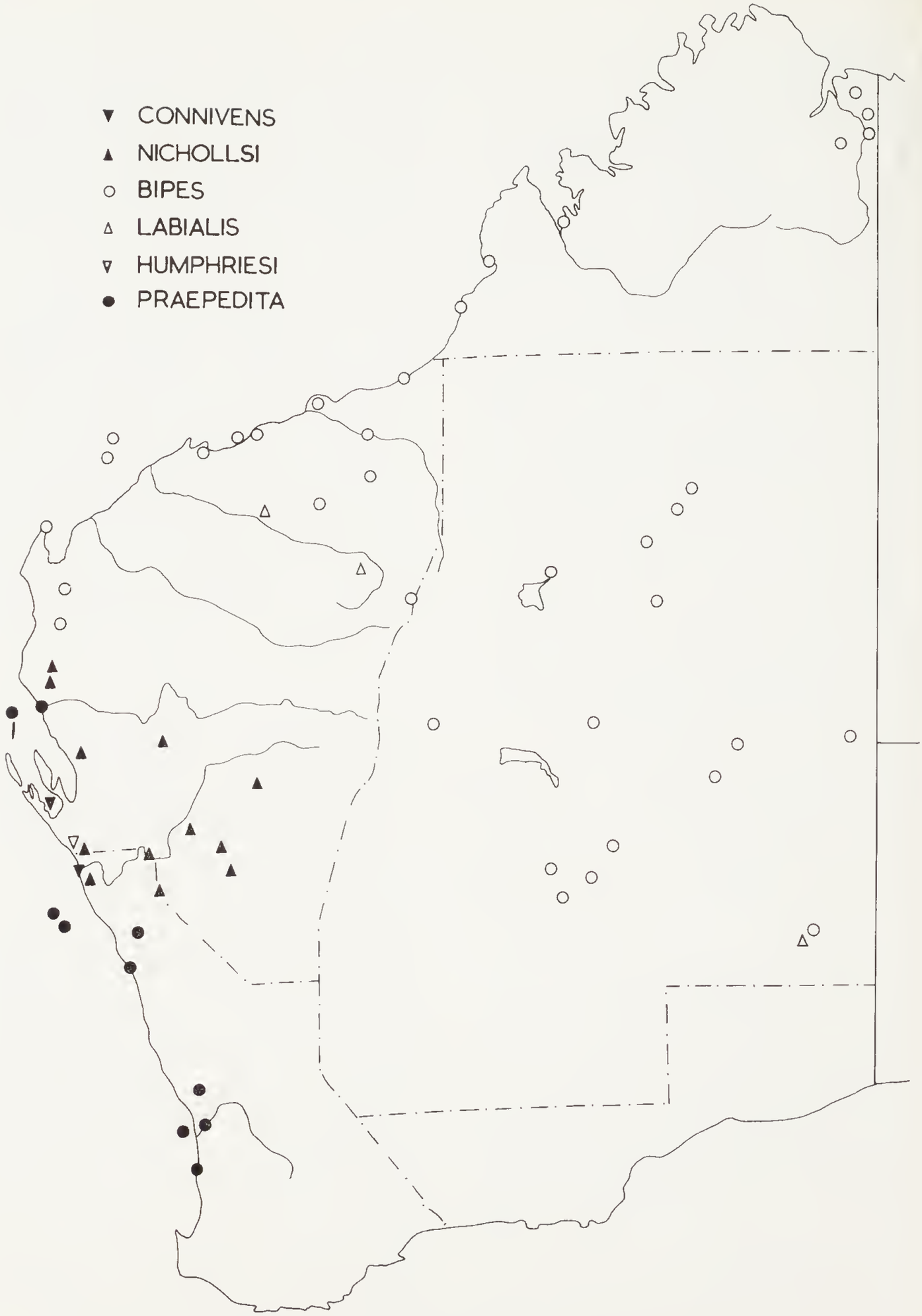

Figure 3.—Map of Western Australia showing location of specimens of *Lerista bipes* species-group.

Diagnosis: Large *Lerista* with the fore-limb much less than half as long as hind-limb; frontoparietals separated; one or more supraciliaries usually fused to supraoculars.

Remarks. This group is best represented in southern arid and semiarid woodlands and scrubs (Fig. 2). Though some if not all species live in leaf-litter like the *elegans* group, they do not expose themselves in the day-time (it is uncertain whether this is because they forage beneath the surface or because they are crepuscular or nocturnal). Whether they are spotted, striped or unpatterned seems to have no phylogenetic significance.

Two species, *L. borealis* and *walkeri,* from regions of moderate rainfall within the tropics are tentatively excluded from the group. They are smaller and not so advanced in fossorial specialisation, e.g. the body is less elongate, the limbs are relatively longer, the snout is blunter, and the supraciliaries do not tend to fuse with the supraoculars.

Also tentatively excluded from the group is *L. lineopunctulata* of the west coast. It is fairly similar in habitus to the *macropisthopus* group, but in view of its unfused supraciliaries is possibly not derived from it. An inhabitant of loose coastal sands, *lineopunctulata* is somewhat more advanced in fossorial development than any member of the *macropisthopus* group, e.g. degree of elongation of body, reduction of limbs and digits, and the fusion of frontoparietals and interparietal into a single shield.

Bipes group

Composition: *L. connivens, nichollsi, bipes, labialis, humphriesi* and *praepedita.*

Diagnosis: Small to medium-sized elongate *Lerista* with no fore-limbs and never more than two toes; snout prolonged, depressed and sharp; ground colour pale with a dark upper lateral stripe and two series of dark paravertebral spots which may be modified into a vertebral stripe.

Remarks: The least specialised forms are *connivens* and *nichollsi.* The remaining species are sand-swimmers *par excellence;* they lack prefrontals and fore-limb groove. Two species, *bipes* and *labialis,* range widely in arid and semiarid regions; the others are confined to the west coast and its vicinity (Fig. 3).

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10—New Western Australian species of Thysanotus R.Br. (Liliaceae)—2

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Abstract

A proposal is made to emend the circumscription of the genus *Thysanotus* so as to include taxa possessing trilocular ovaries with from 2-20 ovules per loculus, in place of 2 ovules per loculus as at present.

Ten new species are described and illustrated —*T. acerosifolius*, *T. brachiatus*, *T. brachyantherus*, *T. nudicaulis*, *T. parviflorus*, *T. pyramidalis*, *T. ramulosus*, *T. sabulosus*, *T. speckii*, all belonging to the section of the genus with six stamens and *T. teretifolius* belonging to the section with three stamens. *T. nudicaulis* is noteworthy in that it has a distribution which extends to Eyre Peninsula, South Australia.

Introduction

The original circumscription of the genus *Thysanotus* (Brown 1810) characterises the ovary as "Ovarium loculis dispermis", the capsule 3-loc. . . ." and the seeds "Semina bina, . . .". Later workers confirm these, e.g. Bentham (1861) "Ovary 3-celled, with 2 ovules . . . . Capsule 3-valved. Seeds (when both ripen) . . ."; Baker (1877) "Ovarium sessile oblongum, ovulis in loculo geminis;" and "Capsula membranacea globosa loculicide trivalvis . . ." and Bentham (1878) "Ovary . . . , 3-celled, with 2 superposed ovules in each cell;" and "Capsule . . . 3-valved. Seeds 1 or 2 in each cell, . . .".

It has been found that the distinctive floral characteristics of the genus such as the possession of fringed inner perianth members, a particular anther morphology and staminal arrangement may be associated with trilocular ovaries containing up to 17 ovules per loculus (*T. brachyantherus* sp. nov.—6-8 and *T. nudicaulis* sp. nov. 10-17). These taxa warrant inclusion within the genus *Thysanotus*. It is therefore proposed to emend the generic description by substituting 'ovules 2-20 per loculus' and 'Capsules 3-valved with up to 50 seeds'.

Thysanotus R.Br. emend. N. H. Brittan.

Ovarium triloculare, utroque loculo ovulis 2-20. Capsula 3-valvata, usque ad 50 seminalis.

Typus:— *T. juncifolius* (Salisb.) Willis et Court.

1. **T. acerosifolius** N. H. Brittan sp. nov.

Holotypus:— Pallarup Rocks, ca 31 miles N. of Ravensthorpe, *Brittan* 60/128-1, 14.xii.1960 (UWA) (Fig. 1).

Isotypi:—*Brittan* 60/128-2 (MEL), 60/128-3 (K), 60/128-4 (CANB), 60/128-5 (PERTH).

Herba perennis; caudex 5—15 mm dia., bracteis et basibus foliorum persistentibus circumcinctus. Tubera ellipsoidea-cylindrica, glabra, flavida, 1.5-5 cm longa, 4-7 mm dia., in radicibus fibrosis 4-9 cm longis. Folia 10-15, filiformia, glabra, 9-24 cm longa, prope basin membranaceo-marginata. Inflorescentia 15-30 cm alta, plerumque in summis 2 cm ramificans. Scapus erectus, teres, glaber, infra ramum primum ebracteatus. Bracteae inflorescentiae 3-4mm longae, acutae, uninervatae. Umbellae circa 4-florae terminales. Bracteae umbellarum late-ovatae, 1-2-nervatae, 2-2.5 mm longae membranaceae. Pedicelli 6-7 mm longi, e basi 2-3 mm articulati, florentes erecti, fructiferi nutantes. Flores ut in genere. Tepala exteriora linearia, 10 mm longa, 1.5 mm lata, anguste membranaceo-marginata; tepala interiora ovata, fimbriis 2-3 mm longis fimbriata. Stamina 6; antherae strictae, non tortae, dorsifixae, loculi basi breviter divergentes, poris terminalibus dehiscentes; 3 exteriores 4 mm longae; 3 interiores 3 mm longae. Ovarium sessile, triloculare, utroque loculo ovulis 2. Stylus terminalis, erectus, strictus. Capsula immatura ab perianthio persistenti inclusa. Capsula matura et semina non visa.

Perennial herb, rootstock 5-15 mm dia., enclosed by bracts and persistent leaf bases of previous years' growth. Roots fibrous, expanding into cylindrical-ellipsoidal tubers at 4-9 cm from rootstock. Tubers glabrous, yellowish, 15-50 mm long, 4-7 mm dia. Leaves 10-15 produced per season, filiform, glabrous, 9-24 cm long, with membranous wings towards the bases. Inflorescences paniculate, 15-30 cm tall, branching usually only in uppermost 2 cm. Scrape erect, terete, glabrous, ebracteate below first branch. Bracts subtending lower inflorescence branches 3-4 mm long, acute, single-veined. Umbel bracts broadly ovate, membranous, translucent, 2-2.5 mm long, 1-2-veined, upper margins dentate between vein ending and margin. Pedicels 6-7 mm long, articulate 2-3 mm from base, erect in flower, nodding in fruit. Flowers as in genus. Outer tepals linear, 5-veined, 10 mm long, 1.5 mm wide, with narrow membranous margins; inner tepals with opaque centre portion, 3-veined, tapering to an acute point, lamina ovate, surrounded by fringe 2-3 mm wide. Stamens 6; anthers straight not twisted, dorsifixed, base of anther projecting beyond point of insertion of filament as two lobes, dehiscence by terminal pore, 3 outer anthers 4 mm long, 3 inner 3mm long. Ovary sessile, trilocular, 2 ovules per loculus, surmounted by straight, erect, style. Immature capsule enclosed within persistent perianth. Mature capsule and seeds not seen.

This species most closely resembles *T. brevifolius* N. H. Brittan (Brittan 1960), from which it differs in the paniculate inflorescence, the shorter, narrower leaves and the marked accumulation of past seasons' leaf bases.

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Figure 1.—*Thysanotus acerosifolius* N. H. Brittan—Holotype: Brittan 60/128-1 (UWA), x 0.5; flower x 1.5.

Figure 2.—*Thysanotus brachiatus* N. H. Brittan—Holotype: Brittan 60/81-1 (UWA), x 0.5; flower x 2.0.

Other specimens:— Type locality, *George* 2259, 14.xii.1960 (PERTH); 7 miles W. of Newdegate on Newdegate-Lake Grace road, *Brittan* 60/135, 15.xii.1960 (UWA).

2. **T. brachiatus** N. H. Brittan sp. nov.

Holotypus:— N. of Eyre Range, ca 21 miles S.S.W. of Ravensthorpe, *Brittan* 60/81-1, 3.xii.1960 (UWA) (Fig. 2).

Isotypus:— *Brittan* 60/81-2 (K).

Herba perennis. Rhizoma ± globosum, circa 7 mm dia. vel cylindricum, horizontale ca 1 cm dia., 3-4 cm longum, testaceum, reliquiis bractearum membranacearum obtectum. Radices fibrosae haud tuberosae. Planta aphylla; 1-2 caules aerii; bracteae radicales 2-4, membranaceae, anguste-lanceolatae, 1.5-2.5 cm longae, 2 mm latae. Caulis basin versus teres, dense tuberculatus, supra porcatus, glaber, 19-25 cm altus, divaricate ramosus; ramus infimus plerumque 1-ramosus. Spicae condensatae terminales. Bracteae spicarum exteriores 2, late-deltoideae, circa 1 mm longae, ad basin 1 mm latae, herbaceae, interiores angustedeltoideae, 1.25-1.5 mm longae, herbaceae. Spicae ad 8-florae. Pedicelli erecti, circa 4 mm longi, e basi circa 1 mm articulati. Flores ut in genere. Tepala exteriora angustissime-lanceolata, anguste membranaceo-marginata, 7-8 mm longa, 1.5 mm lata, mucronata, dorsaliter obscure 5-nervata; tepala interiora elliptica, 3-4 mm lata, fimbriis circa 3 mm longis fimbriata. Stamina 6; antherae flavidae, apicem versus dilute-purpureae, basifixae, poris terminalibus dehiscentes; 3 exteriores ± strictae, parum tortae, 3 mm longae; 3 interiores curvatae, tortae, circa 5 mm longae; filamenta 2.5 mm longa. Ovarium sessile, cylindricum, triloculare, utroque loculo ovulis 2. Stylus terminalis, curvatus, circa 4 mm longus. Capsula immatura circa 3 mm longa, ab perianthio persistenti inclusa. Capsula matura et semina non visa.

Perennial herb. Rootstock a rhizome, ± spherical ca 7mm dia. to horizontal, cylindrical, up to 1 cm dia., 3-4 cm long; pale brown, covered with remnants of membranous bracts. Roots fibrous not tuberous. Plant leafless, aerial stems usually 2 per plant, enclosed by 2-4 radical bracts, the bracts membranous, narrow-lanceolate, 1.5-2.5 cm long, 2 mm wide. Stems terete, 19-25 cm tall, densely tuberculate to retrorsely hirsute in lower parts, upper ridged, ± glabrous; divaricately branched, usually 1-2 sterile bracts below first branch, lowest branch often branched, others simple. Stems apparently persisting for a second year, further branching occurring from nodes on main stem and branches. Condensed spikes terminating branches, outer bracts usually two, herbaceous, broadly deltoid, ca 1 mm long, 1 mm broad at base, inner bracts herbaceous, narrow-deltoid, 1.25-1.5 mm long. Spikes up to 8-flowered, pedicels erect in flower and fruit, ca 4 mm long, articulate ca 1 mm from base. Flowers as in genus. Outer tepals very narrow-lanceolate, narrowly membranous-margined, 7-8 mm long, 1.5 mm wide, mucronate, dorsally obscurely 5-nerved. Inner tepals elliptical, 3-4 mm wide, fimbriate, fimbriae ca 3 mm long. Stamens 6; anthers yellowish with pale purple tips, basifixed, dehiscing by terminal pore; 3 outer ± straight, slightly twisted, 3 mm long; 3 inner curved, twisted, ca 5 mm long; filaments 2.5 mm long. Ovary sessile, cylindrical, trilocular, ovules 2 per loculus. Style terminal, curved, ca 4 mm long. Immature capsule ca 3 mm long, enclosed by persistent perianth. Ripe capsule and seed not seen.

In general habit this species approaches some specimens of the Eastern Australian *T. juncifolius* (Salisb.) Willis et Court. It differs in the greater number of flowers per 'umbel'—here more correctly condensed spikes—and in the development of a dense tuberculate indumentum in the lower parts of the stems; *T. juncifolius* is typically hirsute in this region.

Other specimens:—ca 40 miles W. of Ravensthorpe, *Brittan* 60/76, 1.xii.1960 (MEL); Culham Inlet road, N. of Hopetoun, *Brittan* 60/85, 4.xii.1960 (UWA); 70 miles E. of Ravensthorpe, Ravensthorpe-Esperance road, *Brittan* s.n.,13.xii. 1951 (UWA); 26 miles W. of junction Esperance-Ravensthorpe road with the Norseman road, *Brittan* 60/119, 13.xii.1960 (PERTH).

3. **T. brachyantherus** N. H. Brittan sp. nov.

Holotypus:—In sand plain, nr. Russell Range, ca 100 miles E. of Esperance, *Brittan* 60/95-1, 8.xii.1960 (UWA) (Fig. 3).

Isotypi:—*Brittan* 60/95-2 (K), 60/95-3 (MEL).

Herba perennis; caudex parvus. Tubera ellipsoidea 3-4 cm longa in radicibus fibrosis 5-7 cm longis. Folia radicalia, 4-5, plus minusve teretia, basi membranacea-marginata, circa 15 cm longa, glabra, marcescentia plerumque ante anthesin. Inflorescentia paniculata, raro racemosa. Scapus teres, glaber. Bracteae ramorum infimorum deltoideae, anguste membranaceo-marginatae, acuminatae-caudatae, 5-12 mm longae. Umbellae 1-4-florae, terminales, raro sessiles. Bracteae umbellarum late deltoideae, membranaceae, 1.5-2 mm longae. Pedicelli 5-7 mm longi, e basi 1.0-1.5 mm articulati. Flores ut in genere. Tepala exteriora linearia, membranaceo-marginata, 9 mm longa, 1.5 mm lata; tepala interiora elliptica, 3.5 mm lata, fimbriis 3 mm longis fimbriata. Stamina 6; antherae 3 exteriores parum curvatae, parum tortae, 3 mm longae; antherae 3 interiores parum curvatae, valde tortae, 2 mm longae; filamenta 2.5 mm longa. Ovarium sessile, globosum, trioculare, utroque loculo ovulis 6-8. Stylus erectus, 3 mm longus. Capsula immatura plus minusve globosa, ab perianthio persistenti inclusa. Capsula matura et semina non visa.

Perennial herb, rootstock small with clustered fibrous roots becoming swollen 5-7 cm from stock into ellipsoidal tubers 3-4 cm long. Scape surrounded by 4-5 membranous-based, ± terete, glabrous leaves up to 15 cm long, marcescent, usually before flowering. Inflorescence 1, occasionally 2, usually a panicle, in some specimens reduced to a raceme of umbels. Scape terete, glabrous, bracts at lowest branch 5-12 mm long, triangular, with narrow membranous margins, acuminate to caudate apex. Umbels 1-4-flowered, usually terminal on branches or branchlets, occasionally sessile. Umbel bracts membranous except for vein, broadly deltoid 1.5-2 mm long. Pedicel 5-7 mm long, articulate 1-1.5 mm from base. Flowers as in genus. Outer perianth 9 mm long, 1.5 mm broad, linear with membranous margins; inner perianth 3.5 mm wide, elliptical, fimbriate except for 2 mm at base, fimbriae 3 mm long. Stamens 6; 3 outer anthers slightly curved, slightly twisted, 3 mm long; 3 inner anthers slightly curved, markedly twisted, 2 mm long; filaments 2.5 mm long. Ovary sessile, spherical, trilocular, ovules 6-8 per loculus. Style straight, 3 mm long. Immature capsule enclosed by persistent perianth, ± globular. Mature capsule and seeds not seen.

Figure 3.—*Thysanotus brachyantherus* N. H. Brittan—Holotype: Brittan 60/95-1 (UWA, x 0.5; flower from Brittan 60/93 (x 1.5).

The inflorescence of this species has the general habit of luxuriant specimens of *T. cymosus* N. H. Brittan (Brittan 1960) but differs in the anthers, which are markedly twisted, particularly the smaller whorl, in comparison with the anthers of *T. cymosus* which are not twisted and also show a marked projection of the loculi below the point of insertion of the filament. It is also the case, in the specimens so far seen, that the leaves are marcescent earlier than in *T. cymosus*.

Other specimens:—Junction of Balladonia, Israelite Bay and Esperance tracks, near Mt. Ragged, ca. 110 miles E. of Esperance, *Brittan* 60/93, 8.xii. 1960 (UWA), same locality and date, George 2117 (PERTH).

4. **T. nudicaulis** N. H. Brittan sp. nov.

Holotypus:—65 miles E. of Esperance on Israelite Bay track, *Brittan* 60/106-1, 11.xii.1960 (UWA) (Fig. 4).

Isotypi:—*Brittan* 60/106-2 (K), 60/106-3 (MEL), 60/106-4 (PERTH).

Herba perennis; caudex parvus. Tubera angusteellipsoidea 2-3 cm longa, 5-6 mm dia., in radicibus fibrosis circa 8 cm longis. Bracteae radicales 3-4, lineares, apices acutae, 4-5 cm longae, 3 mm latae, membranaceae. Folia radicalia, 1-2, supra semiteretia vel obscure angulata, basin versus membranaceo-marginata semi-vaginantia, 12-30 cm longa, scabriuscula, marcescentia plerumque ante anthesin. Inflorescentia simplex, raro paniculata. Scapus teres, glaber, bractea 1 (raro 2) sterili, 5-7 mm longa. Rami inflorescentiae simplices, 1-2 cm longi, raro infimi 3 cm longi. Umbellae terminales, 1-4-florae; bracteae exteriores late-ovatae, herbaceae, anguste membranaceo-marginatae; bracteae interiores membranaceae, nervis fuscis. Pedicelli 7-10 mm longi, e basi circa 2-3 mm articulati. Flores ut in genere. Tepala exteriora 13-17 mm longa, 1.5-3 mm lata; tepala interiora angusteovata, 4.5-6 mm lata, fimbriis 2-4 mm longis fimbriata. Stamina 6; antherae 3 exteriores curvatae, tortae, 7.5-10 mm longae; 3 interiores strictae, tortae, 3-4 mm longae; filamenta 2-3 mm longa. Ovarium sessile, triloculare, utroque loculo ovulis 10-17. Stylus erectus, curvatus. Capsula 7 mm longa, 3 mm dia., ab perianthio persistenti inclusa, 30-50 seminalis. Semina nigra, complanata, 1 x 1 x 0.75 mm.

Perennial herb; rhizome small and ± erect. Roots swollen at 3-8 cm from stock into narrow ellipsoid tubers 2-6 cm long, 5-6 mm dia. leaves ± marcescent before flowering, 1-2, terete, glabrous-scabridulous, 12-30 cm long. 1-4 membranous bracts 4-5 cm long, 3 mm broad, enclosing current year's leaves, themselves enclosed by remnants of previous years' leaf bases and bracts. Inflorescence a simple scape with single terminal umbel, in luxuriant specimens becoming paniculate. Scape 12-50 cm tall, terete, usually with one (occasionally 2) sterile, narrow-deltoid bracts 5-10 mm long. In paniculate specimens, peduncles of umbels 5-20 mm long (occasionally 30 mm long) subtended by deltoid bract ca 3-5 mm long. Umbels 1-4-flowered, bracts 3-5 mm long, outer bract broadly ovate-triangular with narrow membranous margins, inner bracts membranous with dark vein. Pedicels erect in flower and fruit, 7-10 mm long, elongating in fruit up to 20 mm, articulate about one third length from base. Flowers as in genus. Outer tepals narrow-linear, 13-17 mm long, 1.5-3 mm wide; inner tepals elliptical, ca 4.5-6 mm wide, fimbriate, fimbriae 2-4 mm long. Stamens 6; three outer anthers curved, twisted, 7.5-10 mm long; three inner anthers straight, twisted, 3-4 mm long; filaments 2.5-4 mm long. Ovary sessile, cylindrical, trilocular, with 10-17 ovules per loculus. Style curved, as long as the longer stamens. Capsule enclosed within persistent perianth, 7 mm long, 3 mm dia. Seeds black, flattened, minutely tuberculate, 1 x 1 x 0.75 mm. Seeds 30-50 per capsule.

This species in habit most closely resembles *T. formosus* N.H. Brittan (Brittan 1960) from which it differs in the production of ellipsoidal tuberous roots (those of *T. formosus* remaining narrow-cylindrical), leaves semi-terete and somewhat angular and the ovary with 10-17 ovules per loculus. It is also noteworthy in its disjunct distribution between S.E. Western Australia and Eyre Peninsula South Australia.

Other specimens:—Esperance - Ravensthorpe road, 18 miles W. of Lort River crossing, *Brittan* 60/121, 13.xii.1960 (UWA); 3 miles E. of Lort River crossing, *Brittan* 60/120, 13.xii.1960 (UWA); 19 miles W. of junction of Esperance-Ravensthorpe road with Norseman road, *Brittan* 60/117, 13.xii.1960 (UWA); S. of Mt. Merivale, ca 13 miles E. of Esperance, *Brittan* 60/109, 12.xii.1960 (UWA), same locality and date, *George* 2205 (PERTH); wet sandy places Esperance Bay to Le Grand, *Maxwell* s.n., s.d., (MEL); base of Mt. Le Grand, ca 16 miles S.E. of Esperance, *Brittan* 60/111, leg. *George*, 12.xii.1960 (UWA) (Fig. 5); slopes of Mt. Le Grand, *Brittan* 60/113, leg. *George*, 12.xii.1960 (UWA); 2 miles N. of Thomas River homestead, ca 60 miles E. of Esperance, *Brittan* 60/107, 10.xii.1960 (UWA); 63 miles E. of Esperance on Israelite Bay track, *George* 2189, 11.xii.1960 (PERTH); 12 miles S.W. of Mt. Ragged, ca 100 miles E. of Esperance, *Brittan* 60/91, 6.xii.1960 (UWA), same locality and date, *George* 2041 (PERTH); 14 miles S. of Mt. Ragged towards Israelite Bay, *Brittan* 60/96, 8.xii.1960, -1 (UWA), -2 (CANB); 3 miles E. of junction Mt. Ragged track and Esperance-Israelite Bay track, *Brittan* 60/97, 9.xii.1960 (UWA); ca 1 mile W. of Israelite Bay settlement, *Brittan* 60/99, 9.xii.1960 (UWA); Point Culver, ca 70 miles N.E. of Israelite Bay, *Brooke* s.n., 1884 (MEL); Port Lincoln, Eyre Peninsula, S.A., *Brown* 17 and 69, 1874 (MEL).

5. **T. parviflorus** N. H. Brittan sp. nov.

Holotypus:—W. slopes of West Mt. Barren, ca 60 miles S.W. of Ravensthorpe, *Brittan* 60/73-1, 29.xi.1960 (UWA) (Fig. 6).

Isotypi:—*Brittan* 60/73-2 (K); 60/73-3 (MEL).

Herba perennis. Rhizoma parvum, bracteis et basibus foliorum persistentibus circumcinctum. Radices carnosulae 1.5-2.0 mm dia. non tuberiferae. Scapus et folia 1 vel 2 bracteis membranaceis circa 4 mm longis subtenti. Folia 1 vel 2 anguste-linearia, teretia, glabra, 10-25 cm longa, basi in vaginas membranaceo-marginatas expansa, sub anthesi praesentia. Scapus inflorescentiae 14-25 cm altus, teres, glaber, apice 2-4-ramosus. Rami 1.5-4 cm longi, bracteis deltoideis 4-6 mm longis, membranaceo-marginatis subtenti. Umbellae binae ramos florentes terminantes, raro umbella sessilis infra summum. Umbella ab bractea late-ovata, 3 mm longa, acuminata, anguste membranaceo-marginata inclusa. Bracteae interiores angusteovatae, membranaceae, nervis purpurascentibus. Umbellae 4-6-florae, pedicellis florentibus erectis, fructiferis

Figure 4.—*Thysanotus nudicaulis* N. H. Brittan Holotype: Brittan 60/106-1 (UWA), x 0.5; flower x 1.5.

Figure 5.—*Thysanotus nudicaulis* N. H. Brittan—Brittan 60/111-1 (UWA) showing paniculate inflorescence, x 0.5.

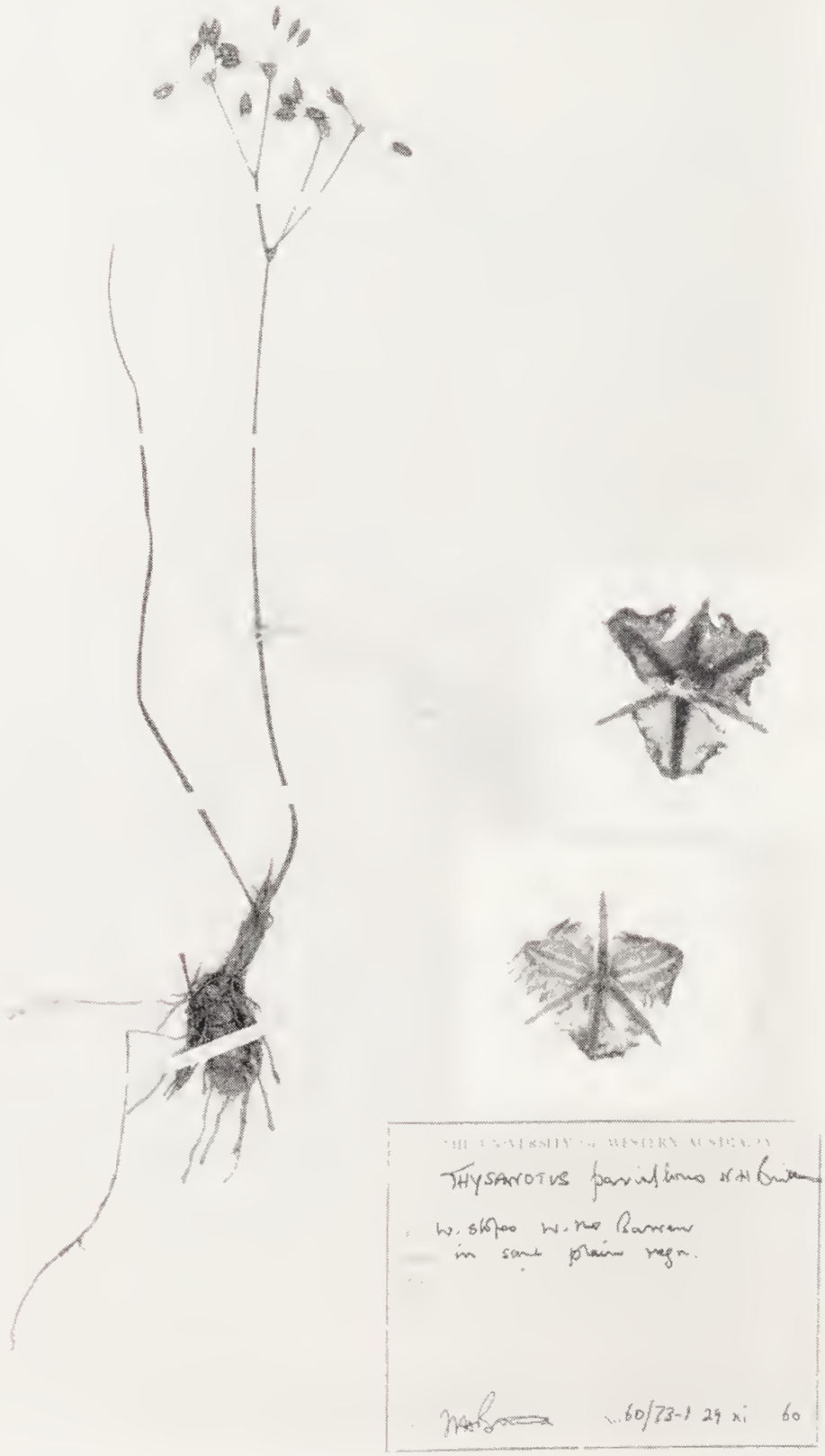

Figure 6.—*Thysanotus parviflorus* N. H. Brittan—Holotype: Brittan 60/73-1 (UWA), x 0.15; flower x 1.5.

nutantibus. Pedicelli 8-10 mm longi, e basi 3 mm articulati. Flores ut in genere. Tepala exteriora linearia, mucronata, 7 mm longa, 1.5 lata, anguste membranaceo-marginata; tepala interiora late-elliptica vel circularia, 5-6 mm lata, fimbriis 2 mm longis fimbriata. Stamina 6; antherae purpureae, strictae non tortae, 3 interiores 2 mm longae, 3 exteriores 3 mm longae; filamenta 1 mm longa. Ovarium sessile triloculare, utroque loculo ovulis 2. Stylus terminalis, erectus, strictus, 3 mm longus. Capsula cylindrica 4 mm longa, 2 mm dia., ab perianthio persistenti inclusa. Semina nigra 1.5 x 1.0 mm.

Perennial herb, rootstock small, surrounded by bracts, bases of leaves and stems of previous years' growth. Roots fleshy, 1.5-2.0 mm dia., no signs of tubers in the specimens. Scape and leaves subtended by 1 or 2 membranous bracts ca 4 cm long. Leaves 1 or 2, narrow-linear, terete, glabrous, 10-25 cm long, usually present at flowering time, with membranous bases similar to the bracts. Inflorescence usually one per plant, scape 14-25 cm tall, terete, glabrous, 1-4-branched. Branches 1.5-4 cm long subtended by triangular bract 4-6 mm long with membranous margins. Pairs of closely appressed umbels at apex of scape and 1-3 branches; occasionally one sessile on scape below terminal one. Each umbel enclosed by a ±broadly ovate-circular bract 3 mm long, acuminate with narrow membranous margins. Inner bracts narrow-ovate, membranous, with distinct purplish veins, projecting at apex. Umbels 4-6-flowered, pedicels erect in flower, nodding in fruit, separating at the articulation at maturity. Pedicels ca 8 mm in flower, 10 mm in fruit, articulation ca 3 mm from base, slightly swollen. Flowers as in the genus. Outer perianth segments 7 mm long, 1.5 mm wide, linear with narrow membranous margins, mucronate; inner perianth segments broad-elliptic to circular, 5-6 mm wide, with 2 mm fringe. Stamens 6; anthers purple, straight, not twisted; inner three 2 mm long; outer three 3 mm long; filaments 1 mm long. Ovary sessile, trilocular, 2 ovules per loculus; style terminal, erect, straight, 3 mm long. Capsule cylindrical 4 mm long, 2 mm wide, enclosed within persistent perianth. Seeds up to 6 per capsule, black, 1.5 x 1.0 mm, with erect funicle and yellow aril ca 1.5 mm long.

This species is reminiscent of *T. chinensis* Benth. in flower size and placement. It differs in having fewer scapes per plant, branched inflorescences with 2-4 umbels per scape, fewer but longer erect leaves and thickened fleshy roots. It also has markedly different distribution.

6. **T. pyramidalis** N. H. Brittan sp. nov.

Holotypus:—65 miles N.E. of Wubin, *Brittan* 58/9-1 11.x.1958 (UWA) (Fig. 7).

Isotypi:—*Brittan* 58/9-2 (CANB), -3 (K), -4 (MEL), -5 (PERTH).

Radices fibrosae fasciculatae, tuberosae. Folia radicalia 6-8, linearia, plana, glabra, 12-16 cm longa, ca 1 mm lata, ante anthesin marcescentia. Scapus 18-30 cm longus, teres, striatus, prope basin hirsutus. Inflorescentia paniculata ramosissima pyramidalis. Bracteae nodorum minutae ca 5 mm longae. Umbellae terminales. Umbellae 1-2-florae. Bracteae 2, cuneatae, mucronatae, 1.5 mm longae. Pedicelli 3-4 mm longi, basi articulati, erecti. Flores ut in genere. Tepala exteriora lanceolata 9-10 mm longa, 2 mm lata, membranaceo-marginata, mucronata, valde 3-nervia; tepala interiora elliptica 4-4.5 mm lata, fimbriis ca 1 mm longis fimbriata. Stamina 6; antherae biloculares, introrsum dehiscentes, 3 exteriores ca 3.5 mm longae, rectae, haud tortae; 3 interiores ca 4 mm longae, parum curvatae, haud tortae. Ovarium sessile, globosum, 1 mm latum. Stylus rectus, ca 5 mm longus. Capsula 3 x 2.5 mm. Semina nigra, 1.5 x 1.0 mm.

Roots clustered, tuberous. Leaves radical 6-8, linear, flat, glabrous, 12-16 cm long, ca 1 mm wide, withering near flowering time. Scape 18-30 cm tall, terete, striate, hirsute near base. Inflorescence a much branched pyramidical panicle. Bracts at nodes small, ca 5 mm long. Umbels borne at ends of final branches. Umbels one-, rarely two-flowered. Bracts 2, cuneate, mucronate, 1.5 mm long. Pedicels 3-4 mm long, articulate at the base, erect at both flowering and fruiting. Perianth 9-10 mm long; outer tepals lanceolate, 2 mm wide, with reflexed mucrone, membranous-margined, markedly 3-veined; inner tepals elliptical, 4-4.5 mm wide, fringed, fringe ca 1 mm wide. Stamens 6; anthers bilocular, dehiscing introrsely by slits along the full length; three outer anthers ca 3.5 mm long, straight, not twisted; three inner anthers ca 4 mm long, slightly curved, not twisted. Ovary sessile, globose, 1 mm diameter; style straight, ca 5 mm long. Capsule 3 x 2.5 mm. Seeds black, 1.5 x 1.0 mm.

Discussion:— see after 7. *T. ramulosus*.

Other specimens:— Yandanooka, ca 60 miles S.E. of Geraldton, *Brittan* 60/53, 26.viii.1960 (UWA) and *Brittan* 67/15, 29.ix.1967 (UWA; ca 11 miles W. of Three Springs towards Eneabba, *Brittan* 64/03, 19.ix.1964 (UWA); 20 miles from Geraldton towards Mullewa, *Phillips* 1584, 30.ix.1962 (CBG 025134); Champion Bay, *Oldfield* s.n.; s.d., (MEL); Champion Bay, *Sewell* s.n., 1889 (MEL); Mingenew District, *Campbell* 90, Oct. 1907 (K).

7. **T. ramulosus** N. H. Brittan sp. nov.

Holotypus:— Just N. of crossing of Murchison River by N.W. Coastal Highway, ca 40 miles N. of Northampton, *Brittan 68/09-1*, 8.ix.1968 (UWA) (Fig. 8).

Isotypi:—*Brittan* 68/09-2 (K), 68/09-3 (MEL).

Herba perennis. Caudex parvus, subterraneus, (in solo) 5-18 cm profundus, reliquiis bractearum circumcinctus. Radices fasciculatae, tuberosae, circa 2 cm longae, 4 mm latae, breviter stipitatae. Bracteae basales, numerosae, lineares, apicibus obtusis, usque ad 15 cm longae, 2-3 mm latae membranaceae. Caulis singularis, glaber, teres; bracteae 1-3, subterraneae, 3-6 cm longae membranaceae, fere ad summum solum attingentes. Caulis aerius aphyllus, teres, glaber vel hirtus pilis complanatis, sparsis, 1 mm longis. Nodi aerii infimi 1-2 steriles, bracteis deltoideis, apicibus acutis, circa 5-6 mm longis, herbaceis; nodi 3-5 ramis dichotomis sterilibus, glabris vel brevi-hirtis vel tuberculatis, ad 3 cm longis, bracteis 2.5-3 mm longis, herbaceis vel diluto-purpureis. Rami bracteis patentibus, deltoideis, infimis 4 mm longis, sursum brevisecentibus herbaceis. Rami superiores similares, ad 6-8 cm longi, internodia quam internodia ramorum inferiorum longiora, umbellis terminati. Umbellae solitariae, bracteis 2, recurvis, late-lanceolatis, apice mucronatis, circa 1 mm longis, herbaceis. Umbellae 1-, raro 2-florae. Pedicelli erecti, 3 mm longi, e basi articulati. Flores ut in genere. Tepala exteriora linearia vel anguste-oblanceolata, 10-11 mm longa, apice acuta, membranaceo-marginata. Tepala interiora elliptica, 5 mm lata, 3-nervata, fimbriis 1.5-2 mm longis

Figure 7.—*Thysanotus pyramidalis* N. H. Brittan—Holotype: Brittan 58/9-1 (UWA), x 0.5; flower x 3.0.

fimbriata. Stamina 6; antherae erectae, basifixae, vix curvatae, non tortae, ventraliter purpureae, dorsaliter luteae, loculi basi breviter divergentes, poris terminalibus dehiscentes. Antherae 3 exteriores 4.5 mm longae, 3 interiores 5 mm longae; filamenta 1 mm longa. Ovarium sessile, cylindricum, triloculare, utroque loculo ovulis 2. Stylus terminalis, strictus, erectus, 5 mm longus. Capsula globosa, 3-4 mm dia, ab perianthio persistenti inclusa. Semina angularia, arillata, nigra, circa 1 x 1 x 1 mm.

Perennial herb. Rootstock small, enclosed by remnants of previous years' bracts, usually 5-18 cm below ground level. Roots clustered, tuberous, ca 2 cm long, 0.4 cm broad, shortly stalked. Bracts basal, several, membranous, linear, apex obtuse, up to 15 cm tall, 2-3 mm wide. Stem usually single, glabrous, terete, bearing underground 1-3 membranous bracts, 3-6 cm long, apices almost reaching ground level. Occasionally an axillary branch grows from one of the upper nodes. Stems above ground leafless, terete, glabrous to hirsute with scattered flattened hairs up to 1 mm long. Nodes above ground: first 1-2 sterile, bracts herbaceous deltoid, apex acute, ca 5-6 mm long Next 2-3 nodes with sterile dichotomous branches, glabrous to shortly hispidtuberculate, up to 3 cm long, nodal bracts herbaceous to pale purplish, 2.5-3 mm long. Branch bracts patent, deltoid, herbaceous, lower 4 mm long, decreasing above. Upper branches similar, 6- ca 8 cm long, internodes longer, branches terminating in umbels. Umbels solitary with two bracts, the bracts herbaceous, ca 1 mm long, broadly lanceolate, recurved, apex mucronate. Umbels 1-, occasionally 2-flowered. Pedicels erect, 3 mm long, articulate at the base. Flowers as in the genus. Outer tepals linear to narrowly oblanceolate, 10-11 mm long, obsurely 3-veined, membranous-margined, apex acute. Inner tepals elliptical, 5 mm wide, 3-veined, fimbriate, fimbriae 1.5-2 mm long. Stamens 6; anthers basifixed, very slightly curved, not twisted, erect, purple ventrally, yellow dorsally, lobes diverging slightly at the base, dehiscing by terminal pore. Outer anthers 4.5 mm long, inner 5 mm long. Filaments 1 mm long. Ovary sessile, cylindrical, triloculer, 2 ovules in each loculus; style terminal, straight, erect, 5 mm long. Capsule globular, ca 3-4 mm dia., enclosed in persistent perianth. Seeds angular, arillate, black, ca 1 x 1 x 1 mm.

These two species are similar in the form of the inflorescence. *T. pyramidalis* however is larger and more branched. *T. pyramidalis* possesses a separate inflorescence and a number of erect marcescent leaves whereas in *T. ramulosus* there are no leaves but the lower part of the plant has a number of leaf-like dichotomous branchlets. The outer tepals of *T. pyramidalis* are markedly 3-veined, whereas those of *T. ramulosus* are obscurely 3-veined. The anthers of *T. pyramidalis* dehisce by slits the full length of the loculi: in *T. ramulosus* dehiscence is by a terminal pore.

Other specimens:— Type locality, George 7899, 7.ix.1966 (PERTH); Mileura Station, ca 75 miles W. of Meekatharra, *Brittan* 70/4, 70/6 and 70/7 (leg. *McComb* and *Mott*, 17.viii.1970) (UWA).

3. **T. sabulosus** N. H. Brittan sp. nov.

Holotypus:— Sand plain 17 miles W. of Newdegate on Newdegate-Lake Grace road, *Brittan* 60/136-1, 15.xii.1960 (UWA) (Fig. 9)

Isotypi:— *Brittan* 60/136-2 (K), 60/136-3 (MEL), 60/136-4 (PERTH), 60/136-5 (CANB).

Herba perennis, caudex complanato-cylindricus circa 5 mm latus. Radices fibrosae fasciculatae sine tuberibus. Folia basalia, numerosa: extima bracteiformes membranacea 9-10 mm longa, basi 3-4 mm lata; intima plus minusve teretia, 4-5 cm longa, 1 mm lata, basi membranacea-marginata, interjacentia intermedia. Caules numerosi, aphylli, ramosi, aliquot speciminibus plus minusve dichotome-ramosi, teretes, in sicco sulcati, basin versus hirsuti, supra glabrescentes. Bracteae anguste-deltoideae, apicibus obtusae, infimae 10-11 mm longae, summae 2 mm longae. Umbellae terminales, 1-3-florae, bracteae late-deltoideae, 1.5-2 mm longae, intimae membranaceae. Pedicelli erecti, 3-6 mm longi, prope medium articulati. Flores ut in genere. Tepala exteriora anguste-elliptica, anguste membranaceo-marginata, 10-12 mm longa, 1.5-2 mm lata; tepala interiora laminis ovate-ellipticis, 6 mm latis, fimbriis 3 mm longis fimbriata. Stamina 6; antherae atropurpureae, basin versus flavidae. Antherae exteriores strictae, tortae, 4 mm longae; antherae interiores parum curvatae, tortae, 5 mm longae; filamenta 3 mm longa. Ovarium sessile, globosum, triloculare, utroque loculo ovulis 2. Stylus strictus, rectus, 5-6 mm longus. Capsula 3-4 mm longa, ab perianthio persistenti inclusa. Semina nigra, 1.5 x 1 x 1 mm.

Perennial herb, rootstock flattened-cylindrical ca 5 mm dia., bearing series of buds on upper surface. Roots fibrous, no signs of tuberous expansion at distances up to 13 cm from the stock. Leaves several, outermost bract-like, membranous, 3-4 mm wide at base, 9-10 mm long, innermost 4-5 cm long with a ± terete blade 1 mm wide, with membranous wings at base. A gradual transition between these extremes occurs. Inflorescence of umbels terminating the branches of a paniculate axis. The lower branches often again branched, upper ones simple. Scape terete, ridged when dry, densely covered with short hairs towards base, becoming glabrous above. Bracts subtending branches: lowermost 10-11 mm long, uppermost 2 mm, narrow-triangular, apex obtuse. Umbels 1-3-flowered, bracts 1.5-2 mm long, broadly triangular, innermost with dark vein and membranous lamina. Pedicels 3-6 mm long, articulate at middle, erect in flower and fruit. Flowers as in genus. Outer tepals 10-12 mm long, 1.5-2 mm wide, narrowly elliptical with narrow membranous margins; inner tepals with 3-veined midrib, tapering to acute apex, expanded lamina ovate-elliptical, ca 6 mm wide, surrounded by fringe 3 mm deep. Stamens 6; anthers dark purple with variable amount of yellow towards base, 3 outer anthers straight, twisted, 4 mm long, inner anthers slightly curved, twisted, 5 mm long; filaments of both whorls 3 mm long. Ovary globular, triloculer, ovules 2 per loculus; style straight, erect, 5-6 mm long. Capsule enclosed within persistent perianth parts, 3-4 mm long, dehiscing while on plant. Seeds 1.5 x 1 x 1 mm, black, minutely tuberculate, aril yellow.

In general habit it recalls a new species from New South Wales, *T. virgatus* N. H. Brittan (Brittan 1971) although *T. sabulosus* appears to be usually smaller and more spreading in habit. It differs in the stems being not hairy

Figure 8.—*Thysanotus ramulosus* N. H. Brittan—Holotype: Brittan 68/09-1 (UWA), x 0.5; flower x 3.0.

Figure 9.—*Thysanotus sabulosus* N. H. Brittan—Holotype: Brittan 60/136-1 (UWA), x 0.5; flower x 2.0.

throughout and in the absence of broad (3.5-5 mm wide) outer tepals, prominently 7- (occasionally 6-) veined on the outer surface.

Other specimen:—3 miles E. of Lake Grace township on Lake Grace to Newdegate road, *Brittan* 60/137, 15.xii.1960 (UWA).

9. **T. speckii** N. H. Brittan sp. nov.

Holotypus:—20 miles N.W. Belele Station, ca 30 miles W.N.W. of Meekatharra, *Speck* 635, 5.ix.1957 (CANB 81373).

Isotypus:—Speck 635 (AD 6001029).

Herba perennis, caudex parvus. Radices fasciculatae, tuberosae, cylindricae, 2.5-3.5 mm longae. Bracteae radicales 1-2, apice acutae, 3-4 cm longae, membranaceae. Folia radicalia, 1-4, supra linearia, basin versus membranaceo-marginata semi vaginantia, 12.5-25 cm longa, in margines et raro supra nerves pilis tuberculatis; interdum ante anthesin marcescentia. Inflorescentia paniculata laxa. Umbellae terminales, 4-6 florae, bracteae late-deltoideae, 2.5 mm longae, manifeste nervatae membranaceae. Pedicelli 5-12 mm longi, prope medium articulati, florentes erecti, fructiferi nutantes. Flores ut in genere. Tepala 6; 3 exteriora linearia vel anguste-lanceolata, anguste membranaceo-marginata, 5-12 mm longa, circa 2.5 mm lata; 3 interiora oblongo-elliptica, 3.5-4 mm lata, fimbriis 1.5-2 mm longis fimbriata. Stamina 6; antherae strictae, basifixae, non tortae, rimis introrsis dehiscentes; loculi basi breviter divergentes, antherae 3 exteriores 4 mm longae, 3 interiores 5 mm longae; filamenta 1.5-2 mm longa. Ovarium sessile, plusminusve globosum, utroque loculo ovulis 2. Stylus terminalis, curvatis, stamina aequans. Capsula cylindrica, circa 5 mm longa, ab perianthio persistenti inclusa. Semina nigra.

Nominavi hanc speciem in memoriam Nathaniel Speck, qui specimina prima lectavit.

Perennial herb; rootstock small; roots tuberous, cylindrical, 2.5-3.5 cm long, clustered close to stock. Leaves and inflorescence enclosed by one or two membranous-edged bracts 3-4 cm long with acute tips, sometimes coloured usually just above ground level. Leaves with membranous-edged sheathing bases similar to sheathing bracts, extending into ± linear, flat lamina, ca 12.5-25 cm long. Leaf margins with tuberculate hairs, in some specimens also occuring over veins on lamina; in some specimens leaves marcescent before flowering. Inflorescence a loose panicle, frequently with additional branches arising from axils of main branches. Bracts on rachis 6-10 mm long, narrow-deltoid with membranous wings near base, bracts on rachillae similar but smaller. Umbels terminal, ca 4-6-flowered, umbel bracts 2.5 mm long, broad deltoid, membranous, with prominent veins. Pedicels 5-12 mm long, articulate about middle, erect in flower, nutant in fruit. Flowers as in genus. Perianth segments 5-12 mm long; outer tepals linear to narrow-lanceolate, ca 2.5 mm wide at base, narrow membranous-edged, inner tepals oblong-elliptical, ca 3.5-4 mm wide with fimbriae 1.2-2 mm long. Stamens 6; anthers straight not twisted, dehiscing by slits the full length of the anther, almost basifixed, loculi projecting as two lobes ca 0.5 mm beyond filament; anthers of outer stamens 4 mm, of inner stamens 5 mm long. Ovary sessile, ± globular; style terminal, curved, ± as long as anthers. Capsule cylindrical, ca 5 mm long, enclosed within persistent perianth parts. Seeds up to 6 per capsule, black with finely reticulate testa.

Named in memory of the late Dr. Nathaniel Speck, friend and former colleague, who made the first collection.

Distinguished from almost all other *Thysanotus* species in its flowers with inner tepals oblong in shape with very short fimbriae and the outer tepals fully recurved in flower. Both these characters recall the Eastern Australian species *T. baueri* R.Br., from which it differs in possessing straight anthers all more or less equal in length and not twisted, compared with *T. baueri* which has twisted anthers, the two whorls of three markedly dissimilar in length.

Other specimens:—Bernier Island, Shark Bay, *Royce* 6011, 23.vii. 1959 (PERTH); Carnarvon Highway, W.N.W. of Woodleigh Station, ca 110 miles S.S.E. of Carnarvon, *Burbidge* 6477, 2.ix.1959 (CANB 167717) (PERTH) (Fig. 10), same locality *Brittan* 60/50, 23.viii.1960 (UWA) (Fig. 10, flower); 22 miles E. of Gascoyne Junction, *Lindgren*, s.n., Sept. 1964 (PERTH); Beringarra Station, ca 100 miles W.N.W. of Meekatharra, *McComb* s.n. 20.viii.1963 (UWA); Mileura Station, ca 75 miles W. of Meekatharra, *Brittan* 70/5, leg. *McComb* and *Mott*, 17.viii.1970 (UWA); N. of Murchison River crossing on N.W. Coastal Highway, ca 40 miles N. of Northampton, *Brittan* 70/10, 25.viii.1970 (UWA); nr. Diemal Find, ca 60 miles N. of Bullfinch, *Brittan* 70/16, leg. *Beltran*, Aug. 1970 (UWA).

10. **T. teretifolius** N.H. Brittan sp. nov.

Holotypus:—Eneabba-Dongara road, ca 18 miles N. of Eneabba, *Brittan* 68/17, 21.x.1968 (UWA) (Fig. 11).

Paratypi:— Eneabba—Dongara road, ca 20 miles S. of junction with Geraldton Highway, *Brittan* 68/20, 21.x.1968 68/20-1 (K), 68/20-2 (MEL).

Herba perennis. Caudex parvus. Radices fibrosae fasciculatae, haud tuberosae. Folia radicalia, alterna, usque ad 10, linearia, teretia, siccitate ± striata accuminata, 12-20 cm longa, 1-1.5 mm lata, basin versus vaginis latis, membranaceo-marginatis, costatis, 5-8 mm latis expansa vetuste, caules novi axillis foliorum veterum exorientes. Inflorescentia surculorum plerumque solitaria, 24-30 cm alta. Scapus teres, simplex, 1-2 bracteis sterilibus vel 1-2-ramosus. Bracteae deltoideae, 10-15 mm longae, herbaceae vel purpureae. Rami 1-2 spicis condensatis terminati. Bractea spicae exterior, late-lanceolata, membranaceo-marginata, circa 6 mm longa, herbacea vel purpurea. Bracteae spicae interiores, lanceolatae, 1-nervatae, acutae, 5-6 mm longae, membranaceae. Pedicelli 11-12 mm longi, e basi 4-5 mm articulati, florentes erecti, fructiferi nutantes. Flores ut in genere. Tepala exteriora anguste-lanceolata, anguste membranaceo-marginata, mucronata, 11-12 mm longa, 2 mm lata. Tepala interiora elliptica, 6-7 mm lata, fimbriis ca 4 mm longis fimbriata. Stamina 3, antherae declinatae, basifixae, purpureae, deltoideae, curvatae, parum tortae, loculi basi breviter divergentes, poris terminalibus dehiscentes; filamenta ca 1 mm longa. Ovarium sessile, ± globosum, triloculare, utroque loculo ovulis 2. Stylus terminalis, declinatus, curvatus, ca 5-6 mm longis. Capsula ab perianthio persistenti inclusa. Semina nigra, arillata.

Perennial herb. Rootstock small. Roots clustered, fibrous, not tuberous. Leaves basal, alternate, up to ca 10, linear, terete, ± striate on drying, acuminate, 12-20 cm long, 1-1.5 mm wide, expanding towards the base into broad, membranous-margined ribbed bases, 5-8 mm wide. In older plants new shoots arise from

Figure 10.—*Thysanotus speckii* N. H. Brittan—Paratype: Burbidge 6177 (PERTH), x 0.5; flower from Brittan 60/50 cult. (x ca 3.0).

Figure 11.—*Thysanotus teretifolius* N. H. Brittan—Holotype: Brittan 63/17 (UWA), x 0.5; flower from Brittan 67/21 (UWA) (x 1.8).

the axils of the old leaf bases. Inflorescence usually one per shoot, 24-30 cm tall. Scape terete, simple, with 1-2 sterile bracts or once to twice branched. Bracts herbaceous—purplish, deltoid, 10-15 mm long. 1-2 condensed spikes terminating the branches, enclosed by broad lanceolate bract, membranous-margined, herbaceous—purplish, ca 6 mm long. Bracts one per flower, lanceolate, membranous, 1-veined, acute, 5-6 mm long. Pedicels 11-12 mm long, articulate 4-5 mm from base, erect in flower, nutant in fruit . Flowers as in genus. Outer tepals narrow-lanceolate, narrowly membranous-margined, mucronate, 11-12 mm long, 2 mm wide. Innertepals elliptical, 6-7 mm wide, fimbriate, fimbriae ca 4 mm long. Stamens 3; anthers purple, deltoid, basifixed with loculi projecting at base, declinate, curved, slightly twisted, dehiscing by terminal pore; filaments ca 1 mm long. Ovary sessile, ± globular, trilocular, 2 ovules per loculus. Style terminal, curved, declinate, ca 5-6 mm long. Capsule enclosed within persistent perianth segments. Seeds black, arillate.

This species resembles some specimens of *T. multiflorus* R.Br. with which it has in common terminal 'umbels' (contracted spikes) of flowers with three stamens. It differs in the terete leaves and in the more frequent occurrence of branched scapes and in the pedicels bending downward as the capsules develop.

Other specimen:— Badgingarra-Eneabba road, ca half mile S. of Jurien Bay turn off, *Brittan* 67/21, 30.ix.1967 (UWA) (flower material only).

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