

Family: AGAMIDAE.

- Iguaniens* part., Cuvier, 1817, Regne Anim., II.
Ascalabotae part., Merrem, 1820, Tent. Syst. Amph.
Stellionidae part., Gray, 1825, Ann. Phil. (2) X, p. 196.
Pneustoidea, *Draconoidea* & *Agamoidea* part., Fitzinger, 1826, Neue Classif. Rept.
Agamidae Gray, 1827, Phil. Mag. (2) II, p. 57, and 1845, Cat. Liz., p. 230. Cope, 1864, Proc. Ac. Sci. Philad., p. 227. Boulenger, 1884, Ann. Mag. Nat. Hist. (5) XIV, p. 119, and 1885, Cat. Liz., I, p. 250, and 1890, Fauna Brit. Ind., p. 109. Gadow, 1901, Amph. & Rept., in Camb. Nat. Hist., VIII, p. 515. Camp, 1923, Bull. Amer. Mus. Nat. Hist., XLVIII, p. 296 et seq. M. Smith, 1935, Fauna Brit. Ind. (Rept. & Amph.), II, p. 130.
Pachygllossae part., Wagler, 1830, Syst. Amph.
Dendrobatae emphyodontes & *Humivagae emphyodontes* Wiegmann, 1834, Herp. Mex.
Iguaniens acrodontes Dumeril & Bibron, 1837, Erp. Gen., IV.
Gonyocephali, *Calotae*, *Semiophori*, *Otocryptae*, *Lophurae*, *Dracones*, *Trapeli*, *Stelliones*, *Leiolepides* & *Phrynocephali* Fitzinger, 1843, Syst. Rept.
Uromasticidae Theobald, 1868, Journ. Linn. Soc., Zool., X, p. 34.

Dentition acrodont, with teeth usually differentiated into incisors, canines and molars. Orbit closed posteriorly. Temporal fossa bridged over by an arch formed mainly by the squamosal and the well developed jugal. Postorbital usually small. Postfrontal and supra-temporal bones absent, or not present as separate elements. Premaxillary single; nasals double; frontal and parietal single. Pterygoids usually widely separated and toothless. Os transversum strongly developed; columella cranii present. Clavicle not dilated; interclavicle T- or anchor-shaped and often small. No dermal ossifications, but spines often present, especially on the head and tail. Tympanum exposed or concealed under the skin. Eye small with a round pupil; eyelids complete and well developed. Tongue rather short and broad, smooth or covered with villose papillae, not or but slightly nicked anteriorly, entirely attached or more or less free in front. No large symmetrical plates on the head or belly. Body covered with scales or tubercles; dermal appendages, such as crests, gular pouches etc. are often present in males or sometimes in both sexes. Femoral and preanal pores present or absent. Limbs well developed; digits usually keeled below or denticulate laterally. Tail usually long and fairly tough.

An exclusively old-world family, distributed throughout Africa, southern Asia, Polynesia and Australia and extending slightly into south-eastern Europe; absent from Madagascar. Represented in Southern Africa by a single genus, viz. *Agama*.

AGAMA Daudin.

- Agama* part., Daudin, 1802, Hist. Nat. Rept., III, p. 333 (type: *Lacerta agama* Linn.). Cuvier, 1817, Regne Anim., II, p. 33. Merrem, 1820, Tent. Syst. Amph., p. 50. Fitzinger, 1826, Neue Classif. Rept., p. 17. Dumeril & Bibron, 1837, Erpet. Gen., IV, p. 481.
Agama Gray, 1845, Cat. Liz., p. 256. Peters, 1882, Reise n. Mossamb., III, p. 38. Boulenger, 1885, Cat. Liz., I, p. 334. Gough, 1909, Ann. Tvl. Mus., I, p. 183. Boulenger, 1910, Ann. S. Afr. Mus., V, p. 464. Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 229. (Note: For full synonymy see Boulenger, 1885, pp. 334 & 335).

The Agamas, commonly known in South Africa as Koggelmanders or Koggelmannetjies (often miscalled Salamanders), are generally of

fairly heavy build, with a broad head and body more or less depressed. Scaling on head small and asymmetrical; on back, tail and upper surfaces of limbs scales small and usually keeled, uniform or intermixed with enlarged spinose scales or tubercles; dorsal and caudal crests present or absent. Eye movable to a certain degree (similar to, but not to nearly the same extent as in *Chamaeleons*), completely encircled by an extensive granular eyelid. Ear-opening largely exposed, with the naked translucent tympanum distinct. A transverse gular fold, extending on to sides of neck anterior to shoulder. Toes slender, with sharp well developed claws. Tail rounded, depressed or compressed and not easily detached. Preanal pores present in males.

Active, alert and diurnal; found in suitable situations from sea level to mountain top; terrestrial, rupicolous, monticolous and arboreal in habits. Oviparous, the eggs being oval and membranous and deposited for incubation in holes dug in the ground for the purpose. Insectivorous and partly herbivorous; probably one of the most important enemies of ants, which they devour with great avidity whenever available. Usually infested with cestode and nematode worms. All possess a distinct capacity (to a greater or lesser degree) for colour change, and the males especially will assume magnificent colours or the reverse, according to seasonal, environmental and excitational stimuli.

Distributed throughout Africa (excluding Madagascar) and extending into South-eastern Europe and Southern Asia. Represented in South Africa by 13 species and subspecies.

Key to the South African Species and Subspecies of *AGAMA*.

- 1 Occipital (or interparietal) scale not enlarged, indistinguishable from adjoining scales on back of head; scales on head and back heterogeneous; arboreal in habits.

A. atricollis A. Smith, p. 127

Occipital scale more or less enlarged, larger than adjoining scales on back of head; scales on head and body more or less uniform or heterogeneous; mainly terricolous or rupicolous in habits 2

- 2 Dorsolateral scales on back with keels directed obliquely outwards from the vertebral line 3

Dorsolateral scales on back with keels directed obliquely inwards to the vertebral line 6

- 3 Dorsal scales somewhat unequal and often intermixed with scattered enlarged, single or small groups of spinose scales

A. atra Daud., p. 129

Dorsal scales more or less equal and regular, no enlarged scales present 4

- 4 Head small and much depressed; vertebral crest absent on back; dorsal scales rounded in shape; 63—76 scales round middle of body

A. planiceps planiceps Pet., p. 133

Head moderate and convex; a low but distinct vertebral crest on back; dorsal scales rhomboidal in shape

- 5 Scales on back much larger than those on belly; ventrals keeled; 69—85 scales round middle of body

A. mossambica mossambica Pet., p. 135

Scales on back (excepting those along vertebral line) not or only slightly larger than those on belly; ventrals smooth; 99—114 scales round middle of body

A. kirkii Boul., p. 136

- 6 Terminal dorsal scale on 3rd or 4th toe much longer than the penultimate; enlarged scales on back (when present) few in number and irregularly scattered; a distinct caudal crest in males 7

Terminal dorsal scale on 3rd or 4th toe not or but slightly longer than penultimate; enlarged scales on back numerous, irregularly scattered or arranged in more or less regular longitudinal rows; no caudal crest present in either sex 8

- 7 Head as long as broad in both sexes; snout very short and rounded; diameter of ear-opening equal to or a little less than cleft of closed eye; ventrals usually more or less keeled; tail feebly compressed in males

A. anchietae anchietae Boc., p. 137

Head longer than broad in males; snout rather pointed, with almost vertical sides; diameter of ear-opening greater than cleft of closed eye; ventrals smooth; tail strongly compressed in males, with a well developed caudal crest

A. anchietae knobeli Boul. & Pow., p. 139

- 8 Scaling very rough above, enlarged spinose scales irregularly scattered or in more or less regular longitudinal rows on back; scales on upper surface of tibia unequal in size; 5th toe not or but exceptionally reaching as far as the 1st; tail usually shorter than head and body in females 9

Scaling not so very rough above, enlarged spinose scales forming more or less regular longitudinal series on back; scales on upper surface of tibia equal in size; 5th toe usually extending as far as the 1st; tail longer than head and body in both sexes 10

- 9 Ventral scales more or less keeled and strongly mucronate; dorsal scaling very rough and enlarged spinose scales usually irregularly arranged; 70—85 scales round middle of body; ear-opening small and diameter much less than cleft of closed eye; 3rd toe longer than 4th

A. hispida hispida (Linn.), p. 141

Ventral scales smooth or feebly keeled; dorsal scaling not so rough as in *hispida hispida*, enlarged spinose scales not so numerous and in longitudinal series; 80—90 scales round middle of body; ear-opening small, diameter much less than cleft of closed eye; 3rd and 4th toes equal or 4th slightly longer

A. hispida brachyura Boul., p. 142

Ventral scales smooth or feebly keeled; dorsal scales smaller than in *h. hispida* or *h. brachyura*; 90—115 scales round middle of body; ear-opening large, diameter equal to or just slightly less than cleft of closed eye; 3rd toe longest or exceptionally 3rd and 4th equal

A. hispida distanti Boul., p. 143

Ventral scales smooth or feebly keeled; 80—90 scales round middle of body; ear-opening very small, diameter less than half cleft of closed eye; 3rd toe distinctly longer than 4th

A. hispida makarikarica Fitz., p. 145

10 Head as long as broad; upper head shields smooth or feebly keeled; ventral scales smooth or but feebly keeled

A. hispida aculeata Merr., p. 146

Head longer than broad; upper head shields keeled; ventral scales more or less strongly keeled and mucronate

A. hispida armata Pet., p. 149

AGAMA ATRICOLLIS A. Smith.

(Plate XVIII, figs. 1—3).

Tree Agama: Black-necked Agama. Boom Koggelmander.

Agama atricollis A. Smith, 1849, Ill. Zool. S. Afr. Rept., App., p. 14 (Type locality: 'Interior of Southern Africa' and 'Country near Port Natal'). Boulenger, 1885, Cat. Liz., I, p. 358 (Natal), and 1887, III, p. 496 (Delagoa Bay), and 1892, in Distant, Naturalist in the Tvl., p. 174 (Pretoria). De Jeude, 1895, Notes Leyden Mus., XVI, p. 228 (Junction Komati & Crocodile Rivs.). Roux, 1907, Zool. Jahrb. Syst., XXV, p. 416 (Lower Illovo; Waterberg, Rustenburg & Pretoria, Transvaal; Mozambique), and Rev. Suisse Zool., XV, p. 82 (Shilowane; Rikatla). Boulenger, 1908, Ann. Natal Mus., I, p. 224 (Indukuduku: Mseleni). Odhner, 1908, Arkiv. Zool. Stockholm, IV, No. 18, p. 3 (Durban; Indukuduku). Chubb, 1908, Ann. Mag. Nat. Hist. (8) II, p. 221 (Kana River, S.R.), and 1909, P.Z.S. Lond., p. 593 (Bulawayo). Gough, 1909, Ann. Tvl. Mus., I, p. 186, pls. XVII & XVIII (Waterval Onder; Lydenburg; Wonderboom; Barberton; Woodbush; Kaapmuiden; Louws Creek; Komatipoort). Boulenger, 1910, Ann. S. Afr. Mus., V, p. 466 (Durban; Barberton; Delagoa Bay; Mazoe). Sternfeld, 1911, Mittl. Zool. Mus. Berlin, V, p. 419 (Mpoma, Tvl.). Hewitt & Power, 1913, Trans. Roy. Soc. S. Afr., III, p. 153 (Marandellas; Francistown). Schmidt, 1919, Bull. Amer. Mus. N.H., XXXIX, p. 477, Map. II, pl. XVIII, fig. 1. Power, 1927, Trans. Roy. Soc. S. Afr., XIV, p. 406 (Lobatsi), and 1931, XX, p. 41 (Linokana). Cott, 1934, P.Z.S. Lond., p. 150 (Amatongas). FitzSimons, 1935, Ann. Tvl. Mus., XVI, p. 348 (Gabani; Kalakamati), and 1937, XVII, p. 265, and 1938, XIX, p. 187 (Oshikango; btwn. Oshikango & Ondonga), and 1939, XX, p. 29 (Mt. Silinda, S.R.).

Stellio capensis A. Dumeril, 1851, Cat. Meth. Rept., p. 106, and Arch. Mus. Hist. Nat. Paris, VIII, p. 579.

Stellio nigricollis Bocage, 1866, Journ. Ac. Sci. Lisb., I, p. 43.

Stellio atricollis Peters, 1881, Sitzb. Ges. Naturf. Fr. Berlin, p. 147. Bocage, 1879, Journ. Ac. Sci. Lisb., VII, p. 95, and 1895, Herp. Angola, p. 22.

Agama gregorii Gunther, 1894, P.Z.S. Lond., p. 86. Boulenger, 1894, P.Z.S. Lond., p. 723.

Description: Head large (especially in adult males, in which the cheeks are strongly swollen), longer than broad, with prominent supraciliary ridges. Nostril rounded, directed outwards and pierced in the posterior half of a somewhat elongate and very slightly

tubular nasal shield on or just below canthus rostralis. Ear-opening larger than eye. Scales on head smooth or feebly and obtusely keeled; occipital not enlarged; moderately enlarged spinose scales scattered irregularly on cheeks; 16—18 scales between supraciliary ridges; 10—14 upper labials; one or two rows of scales between upper labials and nasal shield. Body moderately depressed, covered above with small rhomboidal keeled scales, which are larger down middle of back than on sides; scales on back intermixed with enlarged, strongly keeled, spinose or mucronate scales, which are disposed in more or less regular longitudinal series over middle of back, but on sides are irregularly scattered; a row of somewhat enlarged, keeled scales forms a feeble crest on nape; scales below are smooth, though the posterior gular and abdominal scales tend to be mucronate. A strong fold across throat, extending to midway up either side of neck. Limbs moderately elongate with heterogeneous scaling above, the enlarged scales being strongly keeled and spinose; tibia subequal to or a little longer than head, much longer than foot. Digits compressed; 3rd and 4th fingers subequal, 4th toe slightly longer than 3rd, 5th extending beyond 1st; 20—24 scales in longitudinal series under 3rd or 4th toe. Tail feebly compressed, covered with strongly keeled scales, which form more or less regular annuli; scales above much enlarged and denticulate. Usually a double row of preanal pores in males, averaging 10—12 in each row; occasionally a third row is present.

Colour: Adult males are often brilliantly coloured, being dull bluish to bluish-black on back, with enlarged scales italian blue anteriorly, passing to straw yellow posteriorly; head coppery green to ultramarine above, and bluish-green on sides; a large black spot on either side just in front of shoulder; a broad pale bluish-green to yellowish vertebral streak from back of head to base of tail; throat peacock blue, fading out on chest; belly brownish with irregular patterning of dull blue; tail dull green to olive brown above, yellowish-green on sides and below. Females above, are olive green to olive brown, more or less marbled and reticulated with black; a large black patch on either side just in front of shoulder (as in males), sometimes almost hidden by neck fold. Lower surfaces paler, usually with a dark bluish network or longitudinal vermiculations and bluish infusions on throat. Young specimens usually have a series of XX-shaped, dark markings on either side of back; tail banded with dark brown or black.

Dimensions: Male (T.M. 19370—Komatipoort), H. & B. 167, tail 204, length head 45, breadth head (including cheeks) 45, forelimb 71, hindlimb 93 mm. Female (T.M. 13772—Manaba), H. & B. 139, tail 193, length head 34, breadth head 30, forelimb 62, hindlimb 83 mm.

Field notes: Arboreal and confined to the more open bush and forest country, seldom if ever occurring in rain forest. Very common in certain parts and often found occupying trees in or near native kraals, usually a male and a female together. Owing to their protective colouring and elusiveness, they are often difficult to detect, and on the approach of an intruder will quietly slip out of sight round to the far side of the branches or trunk of the tree they are occupying. When cornered, they assume a most forbidding attitude by raising the head and opening the mouth wide to expose the bright orange yellow interior; generally regarded as poisonous and greatly feared by many natives. Loveridge (1923, p. 947), suggests they are the species specially detested by the Mahomedans, who see in their habit of bobbing the head up and down a caricature of moslems at prayer, and thus think the lizards are mocking them.

Ants form by far the bulk of their diet, though caterpillars, beetles and other insects are also freely taken. The eggs, varying from 8—14 in number, are large, irregularly oval, dull white in colour, with surface (under a hand lens) finely creased and may measure anything from 18—27 × 10—22 mm.; they are deposited in a hole in the ground dug by the parent, and after being carefully covered over, are left to be incubated by the warmth of the sun. The young, on hatching, dig their way out, leaving the old egg-cases rather tattered as if the claws of the young lizards had been used in making their way out of the egg; newly hatched specimens, measuring about 78 (35 + 43) mm. in total length, are plump and healthy and in every way closely resemble (in miniature) the adults; the teeth are well developed, especially the back ones; the dorsal colour markings are as in the adult, but more sharply defined, while the entire lower surfaces are reticulated with light brown; on the middle of the belly, about 7 mm. anterior to the vent, are the remains of the umbilical connection, consisting of a small scar-like elliptical aperture (closing up and disappearing later), round which the scaling is irregular.

Distribution: From East Africa, extending south-west through Southern Rhodesia into Angola, Ovamboland, north and eastern Bechuanaland (as far south as Lobatsi), south throughout the bushveld areas of the Transvaal, and south-east through Portuguese East Africa to Natal. Recorded localities: Salisbury; Kutamas nr. Makwiro; Serowe; Glentig & Honingfontein, Nylstroom Dist.; Zwagershoek; White River; Newington; Dientje nr. Vaalhoek (A.M.). Bulawayo (A.M., K.M. & R.M.). Magoebas Kloof (B.M.). Bakhout; Bellair (D.M.). Amanzimtoti (D.M. & K.M.). Durban (D.M., S.A.M. & T.M.). Plumtree; Marandellas; Francistown; Lobatsi; Rikatla; Mariannhill (K.M.). Mochudi (K.M., S.A.M. & T.M.). Kosi Bay; Nongoma; Indukuduku; Compensation Beach; Pentrich; Pietermaritzburg; Umhlali; Foxhill (N.M.). Weenen (P.E.M. & T.M.). Kana River (R.M.). Mazoe; Chishawasha; Mafa (S.A.M.). Barberton; Delagoa Bay (S.A.M. & T.M.). Mt. Silinda; Oshikango-Ondonga; Kalakamati; Rooiplaat, Saltpan, Wonderboom & Pienaars River, Pretoria Dist.; Koster; Geelhoutkop, Pongola, Boekenhout, Vygeboompoort & Magalakwin River, Waterberg Dist.; Moorddrift; Maribashoek; Pietersburg; Shilowane; Medingen; Metlepetsi River; Bochem nr. Blaauwberg; Lake Fundusi-Entabeni; Tschakoma; Woodbush; Leydsdorp; Lydenburg; Mariepskop; Brak & Olifants River Dists., E. Tvl.; Waterval Onder; Louws Creek; Hectorspruit; Kaapmuiden; Malelane; Crocodile River Bridge; Nelspruit; Komatipoort; Magude; St. Lucia Bay; Ubombo; Manaba; Ingwavuma; Mahlabatini; Eshowe (T.M.).

Remarks: Types in the British Museum of Natural History.

AGAMA ATRA Daudin.

(Plate XIX, fig. 1).

South African Rock or Mountain Agama. Bloukop Klipkoggelmander; Klipsalamander.

Agama atra Daudin, 1802, Hist. Rept., III, p. 349 (Type locality: South Africa). Dumeril & Bibron, 1837, Erp. Gen., IV, p. 493. Gray, 1845, Cat. Liz., p. 256. A. Smith, 1849, Ill. Zool. S. Afr. Rept. App., p. 14 (Southern Africa). Boulenger, 1885, Cat. Liz., I, p. 352 (Cape of Good Hope; Cape Recife; Port Elizabeth). Boettger, 1889, Ber. Senck. Naturf. Ges., p. 287 (Botschabelo nr. Middelburg, Tvl.), and p. 291 (Pondoland). Boulenger, 1903, Ann. Mag. Nat. Hist. (7) XII, p. 217 (Deelfontein, C.P.), and 1905, P.Z.S. Lond., p. 253 (Klipfontein). Roux, 1907, Zool. Jahrb. Syst., XXV, p. 415 (Knysna; Orange River-Jakhalswater; Steinkopf; Klipfontein; Jakhalswater; Matjesfontein; Mossel Bay; Cape Town; French Hoek). Odhner, 1908, Arkiv. Zool. Stockholm, IV, No. 18, p. 3 (Durban; Lake Sibayi). Gough, 1909, Ann. Tvl.

Mus., I, p. 192, pls. XXII—XXIV (Woodbush; Hanover, C.P.; Heidelberg, Tvl.; De Deur, Evaton; Frederikstad; Grahamstown). Boulenger, 1910, Ann. S. Afr. Mus., V, p. 465 (Worcester; Hanover; Prince Albert; Matjesfontein; O'okiep; Stellenbosch; Caledon; Dassen I.; Calvinia; East London; Bredasdorp; Touws River; Port Elizabeth; Kowie; Burghersdorp; Smithfield; Lydenburg; Modderfontein; Krugersdorp). Sternfeld, 1911, Mittl. Zool. Mus. Berlin, V, p. 419 (Bethany, O.F.S.). Hewitt & Power, 1913, Trans. Roy. Soc. S. Afr., III, p. 152 (Taungs; Immigrant; Kimberley; Fort Richmond; Victoria West; Oudtshoorn; Gordon's Bay). Power, 1917, S. Afr. Journ. Sci., XIV, p. 263 (Kimberley). Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 273 (Simons Bay; Johannesburg; Rustenburg; Naroep, etc. Note: Other localities included in list of records from S.A. Museums). Rose, 1926, Ann. S. Afr. Mus., XX, p. 491 (Cape Peninsula). Essex, 1925, Rec. Albany Mus., III, p. 337, and 1927, P.Z.S. Lond., p. 931 (Amatolas; Fort Beaufort; Grahamstown; Port Alfred; Port Elizabeth; Hermanus; Sir Lowry's Pass; Cape Peninsula; Bainskloof; Tradouw Pass; Mossel Bay). Power, 1927, Trans. Roy. Soc. S. Afr., XIV, p. 406 (Lobatsi). Hewitt, 1927, Rec. Albany Mus., III, p. 404 (Hope's Mountain, Basutoland). Rose, 1928, Nature Notes, No. 55, p. 5 & text-fig., and 1929, Veld & Vlei, p. 95, text-figs. 58 & 59, 65 & 66. Power, 1931, Trans. Roy. Soc. S. Afr., XX, p. 41 (Linokana), and 1933, XXI, p. 215 (Kenhardt-Kakamas-Upington). Loveridge, 1936, Field Mus. N.H., Zool. Ser., XXII, p. 53 (Lady Frere).

Agama atra atra FitzSimons, 1935, Ann. Tvl. Mus., XV, p. 531 (Van Rhyn's Pass; Gifberge; Nieuwerust; Soebatsfontein; Lekkersing; Wallekraal; Kuboos; Pofadder), and XVI, p. 346 (Gabani nr. Gaberones). Hewitt, 1937, Guide Vert. Fauna E. Cape Prov. S. Afr., II, p. 24 (Port St. Johns). FitzSimons, 1938, Ann. Tvl. Mus., XIX, p. 187 (Brukkaros Mtn.; Kochena, Great Karasberg; Goodhouse; Klipfontein; Port Nolloth; O'okiep-Springbok; Garies; Hantamsberg nr. Calvinia; Brandvlei).

Agama atra part., Boettger, 1887, Ber. Senck. Naturf. Ges., p. 142 (Malmesbury). Werner, 1910, Jena. Denkschr., XVI, p. 320 (Steinkopf; Brukkaros Mtn.). Sternfeld, 1911, Mittl. Zool. Mus. Berlin, V, p. 401 (Karasberge), and Fauna Deutsch. Kolon., IV, 2, p. 19 (Karasberge; Brukkaros, Steinkopf). Methuen & Hewitt, 1914, Ann. Tvl. Mus., IV, p. 153 (Wasserfall & Kraikluft, Gt. Karasberg).

Agama subspinosus Gray, 1827, Ann. Philos., p. 214.

Trapelus subhispidus Kaup, 1827, Isis, p. 616.

Phrynosoma atra Fitzinger, 1843, Syst. Rept., p. 80.

Agama micropholis Matschie, 1890, Zool. Jahrb. Syst., V, p. 607 (Mpome).

Agama micropterolepis Boulenger, 1896, Ann. Mag. Nat. Hist. (6) XVII, p. 22 (Rustenburg), and 1898, P.Z.S. Lond., p. 914 (Transvaal).

Agama holubi Bocage, 1896, Journ. Sci. Lib. (2) IV, p. 115 (Modder River). Gough, 1909, Ann. Tvl. Mus., I, p. 193.

Description: Head much depressed, as long as or slightly longer than broad, its length from $3\frac{2}{3}$ to 5 times into distance from snout to vent. Snout short, obtusely pointed. Nostril directed upwards and backwards, pierced in a convex subtubular shield on the very short canthus rostralis. Diameter of ear-opening subequal to cleft of closed eye. Scales on head smooth or obtusely keeled, not markedly unequal; occipital scale feebly enlarged; 12—16 scales between supraciliary ridges; 12—16 upper labials; 2—4 rows of scales between upper labials and nasal shield. Body much depressed, covered above with very small, subequal scales, sometimes intermixed more or less with enlarged spinose scales dorsolaterally; scales along median part of back larger and more feebly keeled than towards the sides, where they become much smaller, more strongly mucronate and keeled; keels directed obliquely outwards away from the vertebral line; 90—180 scales round middle of body; groups of short spines on neck and behind ear-opening; vertebral crest feebly developed on nape and back (or absent over latter), reappearing (in males) over distal two-thirds of tail, where it forms a distinct serration. Lower surfaces with smooth, imbricate, non-mucronate scales. Limbs strong, well-developed and moderately long; adpressed hindlimb reaches to

shoulder or as far as ear-opening; length of hand greater than depth of head; fingers and toes short; toes stout, 3rd and 4th equal or 4th slightly longer, 5th extends as far as or a little further than 1st; tibia as long as or slightly longer or shorter than head or foot, and covered with subequal scales. Toes with terminal scale at base of claws above, uni- or tricarinate and much longer than those proximally. Subdigital scales spinose, 16—24 (usually 20—24) under 3rd or 4th toe. Tail more or less compressed in males and up to $1\frac{1}{2}$ times length of head and body, cylindrical and shorter in females; covered above with strongly keeled mucronate (sometimes denticulate) scales; below, scales usually smooth or feebly keeled, and in males often forming more or less regular segments of 3—4 scale rows apiece. Usually a single row of 9—16 (average 12) large preanal pores in males, sometimes a double row is present.

Colour: In adult males the colour is variable and very often brightly marked, ranging from olive grey or green to bluish-grey, brown or reddish-brown above, more or less uniform or with numerous scattered pale-centred ocellar spots and speckling or reticulation of dark brown maroon or black; a pale yellow, orange-yellow, bluish-white or greenish-white vertebral streak often present from nape to base of tail; head, above and on the sides, and upper surfaces or forelimbs blue to greenish-blue; chin, throat and chest blue to ultramarine or purplish-blue, passing to duller tones on belly; a darker (exceptionally bright pink) network design or longitudinal vermiculations often present also on throat, and extending sometimes over chest and belly; sides of body sometimes brightly coloured with vermilion, rust red or purplish red; tail greyish white to olive yellow above, uniform or often with dark crossbands, below and on sides lemon to ochre yellow. In young males colouring generally duller, with bluish infusions confined to the throat. Females are somewhat dun-coloured, being dark grey to brown above, with darker blotches and spots; below white to dirty yellow, with bluish wavy longitudinal lines or a network design on throat and chest; tail with dark crossbands above. In all adults the subdigital scales are straw yellow without dark tips.

Dimensions: Male (T.M. 19156—Klipfontein), H. & B. 135, tail 175, length head 37, breadth head 35, forelimb 62, hindlimb 92, foot 31 mm. Female (T.M. 15967—Lekkersing), H. & B. 108, tail 135, length head 25, breadth head 25, forelimb 49, hindlimb 70, foot 22 mm.

Field notes: Rupicolous and found in suitable surroundings from sea level to mountain top. Very common on the rocky hills and mountain slopes of the Karroo and north-western Cape Province, where they may be seen often in large numbers basking in the sun on ledges and on the tops of rocks and boulders, in association with certain rock-frequenting girdled lizards. When suspicious or inquisitive they exhibit to perfection the somewhat ridiculous agamid habit of bobbing the forepart of the body up and down and, at the same time, turning the head from side to side. Very active and agile, leaping from rock to rock with the greatest ease, and covering distances up to three feet in a single leap; when running at full speed the forepart of the body is well raised and the forelimbs appear to barely touch the ground. Though the tail is not easily detachable, nevertheless the majority of adults are usually found with portions of the tail missing, due no doubt largely to the depredations of various birds of prey which frequent these mountainous localities. According to environment, emotion or light conditions the colouring changes considerably, but generally during the summer months the males, with their bright colouring, are most

conspicuous. They are for the most part insectivorous, subsisting largely on ants (*Poneridae*), together with grasshoppers, beetles, cockroaches, crickets, fossorial wasps, millipedes and spiders; to a limited degree they are also herbivorous, and an examination of stomach contents usually reveals particles of vegetable matter. The eggs, varying from 7—12 in number, are oval and white, with a leathery or membranous covering, and measure when laid anything from 15—18 × 10—12 mm.; they are deposited by the female in a hole in the ground (up to six inches deep) on the sunny side of a suitable rock or boulder; they are laid one by one and each carefully covered with sand until finally the hole is filled in and the eggs left to hatch by the sun's heat; incubation takes from 2—3 months, when the young dig their way out into the open and immediately take up an active life.

Distribution (including var. *rudis*): Throughout the Cape Province, extending northwards into Great Namaqualand, the south east corner of Bechuanaland Protectorate, Orange Free State, Transvaal, Basutoland, Natal and southern part of Zululand. Recorded localities: Bitterfontein; Garies-Kamiesberg; Lutsputs; Graaff-Reinet; Willowmore; Dordrecht; Coetzeesberg; Teafontein; Tradouw Pass; Kei Road; Umtata; Emfundisweni; Middledrift; George Mountain; Zuurburg; Aliwal North; Ludlow; N'tolas; Queenstown; Onrust; Cradock; Alice; Masite & Hope's Mountain, Basutoland (A.M.). Kimberley; Table Mountain (A.M., K.M., S.A.M. & T.M.). Victoria West (A.M., K.M. & T.M.). Williston; Middelburg, C.P. (A.M. & S.A.M.). Fort Brown; Johannesburg (A.M., S.A.M. & T.M.). Grahams-town; Potchefstroom; Doornkop nr. Belfast (A.M. & T.M.). Bethulie (B.M.). Basutoland (D.M. & N.M.). Honeynestkloof; Magersfontein; Dry Harts; Griquatown; Upington; Postmasburg; Douglas; Enslin; Barkly West; Hopetown; Campbell Taungs; Fort Richmond; De Aar; Kenhardt; Steynsburg; Kwelegha; Qumbu; Kingwilliamstown; Colesberg; Witputs; Rietfontein; Strand; Kalk Bay; Paarl; Shawbury; Oudtshoorn; Lobatsi; Thabanchu; Maseru; Boshof; Immigrant; Rooilaagte; Tyateyaneng; Linokana (K.M.). Hanover (K.M., N.M., S.A.M. & T.M.). Kuboos (K.M., S.A.M. & T.M.). Pretoria; Rustenburg; Ottoshoop; Vryburg; Kakamas; Mossel Bay (K.M. & T.M.). Telle Junction; Anenous; Margate; Compensation Beach; Kwambonambi (N.M.). Van Stadens; Elands River (P.E.M.). Port Elizabeth (P.E.M. & S.A.M.). Dunbrody (R.M.). Pakhuisberg; Fraserburg Road; Beaufort West; Dassen Island; Jonkershoek; Touws River; Montagu; Bainskloof; Bredasdorp; Matroosberg; Laingsburg; Nieuwoudtville; Ograbis; O'okiep; Concordia; Naroep; Vioolsdrift; Port Nolloth; Jakhalswater; Kamieskroon; Wortel; Prince Albert; Burghersdorp; Commandofontein; Uniondale; Stutterheim; Engcobo; Port St. Johns; Aughrabies Falls; Krugersdorp; Potgietersrust; Modderfontein; Messina; Lydenburg (S.A.M.). East London; Matjesfontein; Garies; Klipfontein; Klipfontein-Port Nolloth; Springbok-O'okiep; Great Karasberg; Smithfield (S.A.M. & T.M.). Goodhouse; Lekkersing; Wallekraal; Soebatsfontein; Nieuwerust; Hantamsberg; Gifberge; Pofadder; Van Rhyns Pass; Brandvlei; Klaver; Hout Bay; Elandskloof; De Wet; Lamotte; Zoetendal's Vallei; Cape Agulhas; Grootvadersbosch; Garcia Pass; Seven Weeks Poort; Jonkersberg; Noetzie Bay; Knysna; Uniondale-Willowmore; Murraysburg; Rhenosterkop-Beaufort West; Worcester; Prince Albert Road; Philipstown; Fourteen Streams; Brukkaros Mountain; Gabani; Fauresmith; Mamathes; Maquassi; Wolmaransstad-Witpoort; Venterskroon; Schweizer Reneke; Frederik-

stad; De Deur, Evaton; Heidelberg, Tvl.; Morgenzon; Woodbush; Haenertsburg; Leydsdorp; Mariepskop (T.M.). Messina (W.U.M.).

Remarks: Types in Paris Museum?

AGAMA ATRA var. *RUDIS* Boulenger & Power.

Agama atra var. *rudis* Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 282 (Port Elizabeth; Cape Recife; Delagoa Bay; Matabeleland; Mossel Bay; Oudtshoorn; East London; Grahamstown; Keilands; Cradock; Touws River; Commandofontein; Burghersdorp).

Agama atra rudis Hewitt, 1937, Guide Vert. Fauna E. Cape Prov. S. Afr., II, p. 23 (Highlands; Graaff-Reinet; Dordrecht; Queenstown; Fort Brown).

Description: This variety is characterised by having the dorsal scaling coarser and more heterogeneous than in typical *atra*, the enlarged scales being more numerous and often arranged in longitudinal or short irregular transverse series on back and limbs; usually from 90 to 110 scales round middle of body.

Distribution: Confined for the most part to coastal districts of the southern and south-eastern Cape Province, but also found occasionally here and there throughout the range of the species. As the typical form also occurs sporadically along the coast and intermediates are of frequent occurrence both here and inland, it appears that *rudis* cannot be regarded as more than a varietal form.

AGAMA PLANICEPS PLANICEPS Peters.

(Plate XIX, fig. 2).

Damara Rock Agama.

Agama planiceps Peters, 1862, Monatsb. Ak. Wiss. Berlin, p. 15 (Type locality: Damaraland), and 1869, Oefvers. Vet. Ak. Forh., No. 7, p. 658. Boulenger, 1885, Cat. Liz., I, p. 358, and 1888, Ann. Mag. Nat. Hist. (6) II, p. 139 (Namaqualand = Great Namaqualand?). Boettger, 1894, Ber. Senck. Naturf. Ges., p. 89 (Kuisib = Kuisip?). Werner, 1902, Verh. Zool.-bot. Ges. Wien, LII, p. 338 (Windhoek). Gough, 1909, Ann. Tvl. Mus., I, p. 184. Boulenger, 1910, Ann. S. Afr. Mus., V, p. 466 (Damaraland). Werner, 1910, Jena. Denkschr., XVI, p. 324 (Windhoek; Okahandja). Sternfeld, 1911, Fauna Deutsch. Kolon., IV, 2, p. 20, text-fig. 19. Werner, 1915, in Michaelsen, Land- u. Süßwasserfauna Deutsch-S.W. Afr., I, p. 338 (Rehoboth; Windhoek; Karibib). Rose, 1929, Veld & Vlei, App., p. 217 (Omaruru). Fitz-Simons, 1938, Ann. Tvl. Mus., XIX, p. 189 (Otjikondo-Kamanyab; Kamanyab; Farms 'Paderburn' & 'Huab,' on Huab River; Kobos).

Agama planiceps part., Parker, 1936, Novit. Zool., XL, p. 132 (Windhoek; 'Damaraland'; Neu Barmen).

Description: Head small and much depressed, longer than broad. Snout more or less pointed. Nostril directed upwards and outwards, pierced in the posterior part of a small tubular nasal shield on the canthus rostralis. Ear-opening large and completely exposed, much larger than eye-opening. Scales on head smooth or feebly keeled, one or two enlarged elongate scales on middle of snout; occipital much enlarged; groups of small spinose scales on sides of head near the ear and on neck; 14-16 scales between supraciliary ridges; 8-11 (usually 10) upper labials; 1-3 rows of scales between upper labials and nasal shield. Body much depressed, covered above with moderately large, roundish, imbricate scales, feebly or indistinctly keeled mesially, mucronate towards the sides, with keels directed obliquely inwards towards the vertebral line; vertebral crest feebly developed on nape, absent on back but forming a distinct keel on tail in males. Scales

below small and smooth, those on belly smaller than on back; 63—76 (average about 70) scales round middle of body; plicate folds across neck below and on the sides. Limbs long, digits also elongate; adpressed hindlimb reaches to eye or just beyond; tibia much longer than the head; 3rd and 4th fingers equal or 4th slightly longer; 4th toe a little longer than 3rd, 5th extending well beyond the 1st; 19—23 scales in a longitudinal series under 4th toe. Tail from $1\frac{1}{2}$ to $1\frac{3}{4}$ times length of head and body, compressed in males and rounded in females, covered above and on the sides with much enlarged, strongly keeled, mucronate scales, arranged in more or less regular transverse series; below, scales more or less smooth or feebly keeled and mucronate. A row of 8—14 (usually 12) preanal pores in males, occasionally a double row present.

Colour: Adult males with head and neck, above and below, coral to orange- or brick-red, uniform or sometimes with small scattered darker and paler spots on nape, and a few yellow spots on chin and throat; back and upper side of limbs olive brown to dark bluish-brown (often with a purplish sheen anteriorly), and scattered scales dull green; a paler vertebral streak sometimes present; tail above, olive yellow basally, passing to orange-red or orange-brown distally, below, yellowish basally, passing to orange yellow or orange red distally; chest, belly and underside limbs dull purplish, slaty blue to bluish black, usually darkest over belly; soles of feet dirty yellow. In juveniles there are large, symmetrically arranged, bright lemon yellow spots and short streaks on head, and an orange yellow to reddish elongate spot or short streak on either side above axilla; back greyish brown, with darker and paler mottlings; a pale greyish band, dark-edged above and below, along back of thighs and side of tail base; lower surfaces white to pale lemon yellow, with or without longitudinal or clouded vermiculations on throat and chest. Adult females are greyish to olive brown above, with the symmetrical yellow markings on head as found in young specimens; back usually densely infused with dark purplish brown markings; a pale yellowish to reddish vertebral streak occasionally present; lower surfaces greenish white to olive yellow, chin and throat often reddish to reddish brown, or with cloudy vermiculations or a network design of dull grey spreading on to chest, sometimes also greyish or sooty infusions on belly; tail olive above, and greenish white to yellow below.

Dimensions: Male (T.M. 17332—Paderburn), H. & B. 112, tail 208, length head 26.5, breadth head 23, forelimb 51, hindlimb 77, foot 25 mm. Female (T.M. 17229—Kamanyab), H. & B. 102, tail 190, length head 25, breadth head 21, forelimb 56, hindlimb 70, foot 26 mm.

Field notes: Rupicolous and very common on the boulder-strewn hills and koppies scattered over the northern parts of South West Africa. Very similar in habits to *Agama kirkii*, to which it also bears a strong superficial resemblance. Stomach contents appear to consist mainly of vegetable matter (i.e. leaves, seeds and root bulbs), together with beetles and other insects.

Distribution: Damaraland and the Kaokoveld, extending south into the northern part of Great Namaqualand. Recorded localities: Narebis; Kowares; Eriksson's Drift; Kaoko Otavi (S.A.M.). Otjikondo-Kamanyab; Kamanyab (S.A.M. & T.M.). Windhoek; Okahandja; Kobos (A.M. & T.M.). Karib; Rehoboth (A.M.). Khan River, Erongo Mtn.; Karibib; Paderburn & Huab, Kaokoveld (T.M.).

Remarks: Types in the Stockholm Museum. Specimens from Angola are larger in size (reaching to as much as 148 mm. for length of head and body in males, and 120 mm. in females) with, on the

average, a greater number of scales round the middle of body (i.e. 79—90 or more), and appear thus to be separable from typical *planiceps* of Damaraland, which seldom exceeds 120 mm. for length of head and body (even in males) and 76 scales round middle of body. Mertens (1938, *Senckenbergiana*, XX, Nr. 6, p. 433, fig. 6) recognises the Angola form as a distinct subspecies under the name *schacki*, described from Cubal, Benguella District, Southern Angola; Parker (1936, p. 132) on the other hand, suggests that 'further material from Southern Angola and northern Damaraland will show a continuous gradation, rendering it impossible to recognise any clearly defined races.'

AGAMA MOSSAMBICA MOSSAMBICA Peters.

Mozambique Agama.

Agama mossambica Peters, 1854, *Monatsb. Ak. Wiss. Berlin*, p. 616 (Type locality: Coast of Mozambique), and 1855, *Arch. Naturg.*, I, p. 45, and 1882, *Reise n. Mossamb.*, III, p. 38, pl. VII, fig. 1 (between 7° and 20° S. latitude, Mozambique). Fischer, 1883, *Jahresb. Naturh. Mus. Hamburg*, p. 21, pl. II, fig. 6 (nr. mouth of Pangani River). Boulenger, 1885, *Cat. Liz.*, I, p. 353. (Zambesi; Quelimane), and 1907, *P.Z.S. Lond.*, II, p. 484 (Beira). Gough, 1909, *Ann. Tvl. Mus.*, I, p. 185. Boulenger, 1910, *Ann. S. Afr. Mus.*, V, p. 466. Loveridge, 1923, *P.Z.S. Lond.*, pp. 847 & 943, and 1924, *Jour. E. Afr. & Uganda N.H. Soc.*, suppl. 3, p. 10 (Tanganyika locs.). Cott, 1934, *P.Z.S. Lond.*, p. 150 (Caia; Charre; Amatongas).

Agama mossambica mossambica Barbour & Loveridge, 1928, *Mem. Mus. Compar. Zool.*, L, p. 147 (Tanganyika). Loveridge, 1929, *U.S. Nat. Mus. Bull.*, 151, p. 57 (Morogoro, T.T.). Mertens, 1937, *Abh. Senck. Naturf. Ges.*, 435, p. 7 (Inhamaing).

Agama carniventris Peters, 1874, *Monatsb. Ak. Wiss. Berlin*, p. 159.

Agama colonorum part., Loveridge, 1920, *P.Z.S. Lond.*, p. 140 (Lumbo).

Description: Head moderate, convex and longer than broad. Nostril directed upwards and backwards, pierced in the posterior part of a small tubular nasal shield on the canthus rostralis. Ear-opening completely exposed, diameter longer than cleft of closed eye. Scales on head feebly keeled, with 2—3 enlarged elongate scales on middle of snout; occipital much enlarged; about 16 scales between supra-ciliary ridges; groups of small spinose scales near the ear and on side of neck; 9—10 upper labials; 3 rows of scales between upper labials and nasal shield. Body moderately depressed; scales on back strongly keeled, mucronate and imbricate with keels directed obliquely inwards towards the vertebral line; dorsal crest distinct on nape, low on back but well raised again on tail. Gular and ventral scales imbricate, more or less distinctly keeled and shortly mucronate (sometimes almost smooth, especially in old specimens); scales on belly smaller than on back; 69—85 scales round middle of body. No regular gular pouch, but a strong fold present across neck and on the sides. Limbs moderate; adpressed hindlimb reaches to between shoulder and ear-opening or not quite as far as the latter; tibia as long as head; 3rd and 4th fingers equal or 4th slightly longer; 4th toe a little longer than 3rd or subequal thereto, 5th extending as far as or a little further than 1st; about 22 or 23 scales under 4th toe. Tail about $1\frac{2}{3}$ times length of head and body, slightly depressed basally but compressed distally, covered with large strongly keeled mucronate scales, which are much larger than on back. Males with a single or double row of preanal pores, usually 12 pores in a row.

Colour: Adult males above, are pale dirty yellowish brown, ash grey or olive, uniform or with a row of 4—5 large elongate and more or less confluent brick red, brown or blackish spots on either side of

back, or with dark brown vermiculations; a bluish vertebral streak, brightest on nape, often present; head olive to dark brown, with darker markings on sides and a distinct reddish bar across forehead in front of eyes; a large reddish spot or blotch on either side just above shoulder; lower surfaces dirty white or pale greyish green, with bright blue vermiculations on chin and throat, converging to a blue patch at base of throat. In young specimens, the enlarged dorsal spots are more clearly marked in blackish brown and separated from one another by smaller yellow spots; vertebral streak yellowish; sides of body spotted with brown and yellow; head olive brown, passing to bluish green posteriorly, with yellow spots above and below ear; limbs and tail with dark crossbands above.

Dimensions: Male (T.M. 12438—Mozambique), H. & B. 114, tail (damaged) 128, length head 25, breadth head 23, forelimb 51, hindlimb 76. (Note: Normal tails in males almost twice length of head and body).

Field notes: Terricolous and arboreal; when disturbed will usually seek refuge in the nearest tree or palm, up which they climb with great rapidity. Like other species of the genus, they exhibit a remarkable range and variation in colouring according to the time of year, environment and excitational stimulus. Ants appear to form by far the bulk of their diet, while beetles, grasshoppers, termites, cockroaches and myriapods are also taken freely.

Distribution: From Tanganyika Territory and Nyasaland, southwards into Northern Rhodesia and northern parts of Portuguese East Africa. Recorded localities: Beira (N.M.). Mozambique (T.M.).

Remarks: Types in the Berlin Museum.

AGAMA KIRKII Boulenger.

(Plate XVIII, figs. 4 & 5).

Kirk's Rock Agama.

Agama kirkii Boulenger, 1885, Cat. Liz., I, p. 354, pl. XXVIII, fig. 2 (Type locality: Zambesi, E. Africa), and 1902, P.Z.S. Lond., II, p. 16 (Mazoe). Chubb, 1909, P.Z.S. Lond., p. 593 (Mount Silosi; Khami Riv.). Gough, 1909, Ann. Tvl. Mus., I, p. 185. Boulenger, 1910, Ann. S. Afr. Mus., V, p. 466 (Importuni). Sternfeld, 1911, Mittl. Zool. Mus. Berlin, V, p. 416 (Portu. E. Africa). Hewitt & Power, 1913, Trans. Roy. Soc. S. Afr., III, p. 153 (Marandellas; Insiza). FitzSimons, 1935, Ann. Tvl. Mus., XVI, p. 347 (Zimbabwe), and 1939, XX, p. 29 (Changadzi River; Birchenough Bridge).

Description: Head moderate, convex, longer than broad; snout somewhat pointed. Nostril directed outwards or upwards and outwards, pierced in the posterior part of a small tubular nasal shield on or just below canthus rostralis. Ear-opening completely exposed, diameter subequal to cleft of closed eye. Scales on head heterogeneous, slightly convex, usually smooth but sometimes feebly keeled; 2 or 3 longitudinally enlarged scales on middle of snout; occipital enlarged, with a very shallow pineal pit; groups of spinose scales behind ear and on sides of neck; 14—18 scales between supraciliary ridges; 8—11 (usually 10) upper labials; 3—4 (usually 3) rows of scales between upper labials and nasal shield. Body moderately depressed, covered above with small rhomboidal, imbricate, strongly keeled scales, which are often also shortly mucronate (not so strongly keeled nor mucronate in females as in males), and whose keels are directed obliquely inwards towards the vertebral line; dorsal crest well-developed on nape, low but distinct on back and well-marked on tail in adult males, low but distinct throughout in females and young specimens; gular and ventral scales smooth; 99—114 scales

round middle of body; no regular gular pouch, but a strong fold present across neck below and on the sides. Limbs moderately elongate; adpressed hindlimb reaches to ear or just beyond; tibia much longer than head, subequal to foot; 4th finger longest; 4th toe longest, 5th extending well beyond 1st; 19—23 scales in a longitudinal series under 4th toe. Tail almost twice as long as head and body in males, compressed and covered with large strongly keeled mucronate scales, arranged in more or less regular annuli; in females, tail more slender and less compressed, about $1\frac{1}{2}$ times length of head and body. Usually a single row of 10—14 preanal pores in males, sometimes a double row present.

Colour: In adult males the head and neck (above and below), coral red; back, bluish black, with a broad pale bluish white vertebral band from nape to root of tail; limbs paler above than on back; chest and belly navy blue; a series of narrow pale bluish annular bands on tail. Immature males are olive brown above, with irregular darker markings or with a dark network enclosing lighter-coloured ocelli; dirty white below, with dark brown infusions or vermiculations on throat and chest, sometimes extending also over belly. Females rich brown above, with irregular infusions of darker brown; snout and postorbital regions of head tinged with blue; below, dirty white with dusky infusions.

Dimensions: Male (T.M. 14597—Zimbabwe), H. & B. 97, tail 171, length head 23, breadth head 20, forelimb 43, hindlimb 65, foot 24 mm. Female (T.M. 18677—Birchenough Bridge), H. & B. 90, tail 134, length head 23, breadth head 19, forelimb 38, hindlimb 60, foot 22 mm.

Field notes: Rupicolous, apparently preferring outcrops and koppies of granite formation, which they share in common with *Platysaurus guttatus rhodesianus*, *Gerrhosaurus v. validus* and *Mabuya q. margaritifer*. Like *Agama atra*, they are very curious and with heads well raised, will peer at first cautiously and then more intently over the tops of rocks and boulders at an intruder. The seemingly conspicuous coral coloured heads of the adult males, are found actually to match very closely one of the lichens commonly found on granite, and thus a lizard at rest is by no means as conspicuous as might at first be imagined. Stomach contents are made up almost exclusively of ants, with sometimes a few beetles and other insect remains. The eggs are suboval and average about 10 in number.

Distribution: An eastern species ranging from the southern part of Tanganyika Territory through Nyasaland, Portuguese East Africa and Southern Rhodesia to the eastern border of the Bechuanaland Protectorate. Recorded localities: Marandellas (A.M., K.M. & N.M.). Penahlunga (K.M.). Bindura; Chishawasha; Hunyani River (S.A.M.). Macheke; Driefontein; Empandeni; Mtoko; Chilimanzi; Gokomere; Kutamas; Bikita; Salisbury (A.M.). Nr. Bulawayo; Sinoia (R.M.). Khami River; Matopos; Zimbabwe; Changadzi River; Birchenough Bridge (T.M.). Mochudi (K.M. & T.M.).

Remarks: Types in the British Museum of Natural History.

AGAMA ANCHIETAE ANCHIETAE Bocage.

Anchieta's Desert Agama.

Agama sp. Bocage, 1895, *Herp. Angola*, p. 21.

Agama anchietae Bocage, 1896, *Jorn. Sci. Lisb.* (2) IV, p. 129 (Type locality: Littoral Region, Angola). Gough, 1909, *Ann. Tvl. Mus.*, I, p. 187. Monard, 1937, *Arquiv. Mus. Bocage*, VIII, p. 60 (Angola locs.).

Agama anchietae anchietae Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 268 (Goas; Maltahohe). Schmidt, 1933, Ann. Carnegie Mus., XXII, p. 9 (Angola locs.). Parker, 1936, Novit. Zool., XL, p. 131 (Voigtsgrund; Satansplatz; Maltahohe; Windhoek; Hoffnung). FitzSimons, 1938, Ann. Tvl. Mus., XIX, p. 186 (north of Keetmanshoop; nr. Lake Guinas; Kamanyab; Paderburn, on Huab Riv.; nr. Karub; nr. Windhoek; Neudamm; Maltahohe; btwn. Kuibis & Konkiep; Seeheim; Berseba; Van Wyksvlei).

Agama atra part., Sternfeld, 1911, Mittl. Zool. Mus. Berlin, V, p. 401 (Warmbad). Methuen & Hewitt, 1914, Ann. Tvl. Mus., IV, p. 135 (Wasserfall, Kraikluft & betwn. Kraikluft & Narudas Süd, Gt. Karas Mtns.; Grundoon—Wasserfall, Klein Karasberg; Kuibis).

Agama aculeata part., Methuen & Hewitt, 1914, Ann. Tvl. Mus., IV, p. 136 (Sandmund & Kraikluft, Karasberg Dist.; Kuibis).

Agama anchietae var. *methueni* Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 269 (Gt. Karas Mtns.; Naroep; Zwart Modder; Voigtsgrund). Power, 1933, Trans. Roy. Soc. S. Afr., XXI, p. 215 (Kenhardt-Kakamas; Upington-Kenhardt). FitzSimons, 1935, Ann. Tvl. Mus., XV, p. 531 (Warmbad, south; Kuibis; Seeheim; nr. Rietfontein, Gordonia; Pofadder).

Description: Head convex, a little longer than broad. Snout very short and rounded, obtusely pointed. Nostril directed upwards and outwards or almost directly upwards, pierced in a strongly convex subtubular shield on or just above the very short canthus rostralis. Diameter of ear-opening equal to or a little less than cleft of closed eye. Scales on head smooth or obtusely keeled; 10–14 scales between supraciliary ridges; occipital moderately enlarged (especially in young specimens); 11–14 upper labials, and 3–4 rows of scales between latter and nasal shield. Body somewhat depressed, covered above with strongly keeled scales, intermixed with irregularly scattered, enlarged, mucronate and spinose scales, which are sometimes comparatively few in number or almost absent; dorsolaterally and towards the sides of body, all scales have their keels directed obliquely inwards towards the vertebral line. Groups of spinose scales present on sides of neck and behind ear-opening. Vertebral crest low on nape, continued on back in the form of a series of slightly enlarged, more or less strongly keeled scales, often only feebly indicated or absent. From 90–105 scales round middle of body. Gular and ventral scales keeled (sometimes smooth), often becoming faintly mucronate towards the sides. Limbs moderately elongate; adpressed hindlimb reaches to neck or as far as the ear-opening; length of hand equal to or a little less than depth of head; fingers and toes short, not or but feebly compressed; 3rd toe slightly longer than 4th, 5th extending as far as or a little further than 1st; tibia subequal in length to head; foot shorter than or as long as head. Scales on upper side of tibia more or less equal in size; toes with terminal scales at bases of claws above, tricarinate and much longer than those proximally; subdigital scales spinose, 13–17 (usually 15–16) in a longitudinal series under 3rd toe. Tail cylindrical in females, moderately compressed in males, covered with strongly keeled subequal scales; in males there is a serrated crest above, which is low or absent basally but more prominent distally. A single row of rather large preanal pores in males, usually from 10–12 in number.

Colour: Above, yellowish to greyish or pinkish brown, uniform or with 4–5 pairs of large dark brown to blackish spots or irregular crossbands on back, separated by a vertebral series of pale roundish spots or a pale vertebral streak; upper side limbs and tail more or less banded. Lower surfaces white to pale yellow, with dark bluish to greyish black longitudinal wavy stripes on throat; subdigital

scales usually tipped with dark brown or black. In adult males the head is often bright blue to bluish green above and on the sides, while below there is a large dark blue blotch at base of throat; sides of body reddish brown.

Dimensions: Male (T.M. 15345—Pofadder), H. & B. 102, tail 146, length head 29, breadth head 25, forelimb 49, hindlimb 67, foot 21.5 mm. Female (S.A.M. 14155—Goas), H. & B. 84, tail 109, length head 23, breadth head 21, forelimb 41, hindlimb 55, foot 19.5 mm.

Distribution: From the north-western Cape Province, through South West Africa and Angola to the Lower Congo. Recorded localities: Rehoboth; Windhoek; Karib; Karibib (A.M.). Usakos (A.M. & S.A.M.). Kenhardt—Upington; Kenhardt—Kakamas; Niekerkshoop; Zwartmodder, Rietfontein; Kuboos; Marienthal (K.M.). Bakputs, Gordonia; Aughrabies Falls, N. bank Orange River; Narugas; Great Karasberg; Hierabis; Goas; Voigtsgrund; Outjo (S.A.M.). Maltahohe (S.A.M. & T.M.). Van Wyksvlei; Pofadder; Rietfontein, Gordonia; Sandmund, Kraikluft; Wasserfall, btwn. Kraikluft & Narudas Süd, and btwn. Grundoon & Kraikluft, Great Karasberg Dist.; Warmbad, G.N.; Kuibis; Seeheim; nr. Keetmanshoop; Berseba; btwn. Kuibis & Konkiep; nr. Windhoek; Karub; Lake Guinas; Kamanyab; Paderburn (T.M.).

Field notes: Rupicolous, and in the southern part of its range often found in association with *Agama atra*, from which it can usually be distinguished in the field by its less active movements and generally paler and less conspicuous colouring (especially in the males). Diet consists mainly of termites and small terrestrial beetles. The eggs, usually from 10—12 in number, average 15.5×10.5 mm.

Remarks: Types in the Lisbon Museum. In view of the considerable variation in characters found throughout the range of the species, manifesting every stage of intergradation between typical *anchietae* and the variety *methueni*, it appears impossible to retain the latter as a separate form.

AGAMA ANCHIETAE KNOBELI Boulenger & Power.

Knobel's Desert Agama.

Agama atra part., Boettger, 1887, Ber. Senck. Naturf. Ges., p. 142 (Aus). Werner, 1910, Jena. Denkschr., XVI, p. 320 (Luderitzbucht; Kubub). Methuen & Hewitt, 1914, Ann. Tvl. Mus., IV, p. 135 (Aus; Luderitzbucht). Sternfeld, 1911, Fauna Deutsch. Kolon., IV, 2, p. 19 (Luderitzbucht; Namib; Aus; Kubub). Methuen & Hewitt, 1914, Ann. Tvl. Mus., IV, p. 135 (Aus; Luderitzbucht).

Agama atra (non Daudin) Boettger, 1886, Ber. Senck. Naturf. Ges., p. 12, (Angra Pequena). Fischer, 1888, Mittl. Mus. Hamburg, p. 12 (Aus). Lampe, 1911, Jahrb. Nassau. Ver. Naturk., LXIV, p. 160 (Garub). Werner, 1915, in Michaelsen, Land- u. Süßwasserfauna Deutsch.-S.W. Afr., I, p. 336 (Luderitzbucht).

? *Agama armata* Lampe, 1911, Jahrb. Nassau. Ver. Naturk., LXIV, p. 159 (Luderitzbucht).

Agama anchietae var. *knobeli* Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 271 & text-fig. (Type locality: Aus).

Agama anchietae knobeli FitzSimons, 1935, Ann. Tvl. Mus., XV, p. 532 (Aus; Haalenberg), and 1938, XIX, p. 187 (nr. Aus).

? *Agama anchietae* Mertens, 1937/38, Veröff. Deutsch. Kolon.- und Übersee Mus. Bremen, II, hft. 1, p. 11 (Luderitzbucht).

Description: The males are clearly distinguishable from the typical form on the following: Head longer than broad; snout rather

more pointed and narrower, with almost vertical sides; nostril directed more or less backwards and pierced in the posterior half of the convex nasal shield on the canthus rostralis; diameter of ear-opening longer than cleft of closed eye; scales on head rather large and smooth; 12—14 scales between supraciliary ridges; occipital scales somewhat feebly enlarged; 2—3 rows of scales between labials and nasal shield; body distinctly depressed; scales on back small, smooth or keeled, a little larger along middle line than towards the sides, uniform or intermixed with a few irregularly scattered, slightly enlarged scales; 134—143 scales round middle of body; ventral scales smooth and slightly smaller than those on back; vertebral crest distinct on nape and back, or sometimes fading out over posterior half of back; caudal crest absent or feebly defined basally, but well-developed and conspicuous over middle third of tail, where scales may reach a height of from 3.5 to 4 mm. in large specimens; tibia longer than head, subequal in length to foot; toes compressed distally; 3rd and 4th toes equal or 4th slightly longer; 18—19 scales under 3rd or 4th toe; tail strongly compressed over distal three-quarters to four-fifths of its length (from 2—3 times as deep as broad), tapering rapidly towards the tip; preanal pores usually in a single row of 12—16, occasionally an incomplete second row may be present. Females differ from the males in the more depressed head and rounded snout; head as broad as long; 11—13 scales between supraciliary ridges; scales on back distinctly keeled, enlarged scales absent; vertebral crest feebly indicated on nape, absent on back and tail; latter not compressed; 125—128 scales round middle of body.

Colour: Adult male greyish blue to dull bluish or greyish brown above, usually speckled with dark brown to blackish and very occasionally with a series of 4—5 faintly marked darker blotches on either side of back; usually a pale yellowish or bluish white vertebral streak present; head often bright blue above and on the sides; membrane round eye orange red; lower surfaces yellowish white to smoky grey, chin, throat and chest suffused with blue (extending sometimes to underside of forelimbs) together with a darker network or longitudinal vermiculations; inguinal region and underside tail orange yellow; tail dirty yellow above, with or without dark bands. Young males are variegated with dark grey to rich brown above, and have longitudinal vermiculations of blue on the throat. Females are grey to greyish brown, more or less uniform or variegated with darker; vermicular stripes present on throat, but bluish infusion at base of throat pale or absent; tail with irregular dark transverse blotches above, uniform yellowish below.

Dimensions: Male (T.M. 15349—Haalenberg), H. & B. 140, tail 175, length head 33, breadth head 30, forelimb 56, hindlimb 87 mm. Female (T.M. 15346—Aus), H. & B. 100, tail 128, length head 21, breadth head 21, forelimb 48, hindlimb 67 mm.

Field notes: A rock-frequenting form, with habits much like those of *Agama atra*, with which it has often been confused owing to the similarity in appearance and colour markings.

Distribution: Apparently restricted to the mountainous parts of Great Namaqualand, from Keetmanshoop to Luderitzbucht. Recorded localities: Aus (K.M. & T.M.). Keetmanshoop; Haalenberg (T.M.). Luderitzbucht (A.M., S.A.M. & T.M.).

Remarks: Cotypes in the British Museum of Natural History and the McGregor Museum, Kimberley.

AGAMA HISPIDA HISPIDA (Linnaeus).

(Plate XIX, fig. 4).

Cape Spiny Agama.

- Lacerta hispida* Linnaeus, 1754, Mus. Adol. Fred., p. 44, and 1758, Syst. Nat., Ed. 10, I, p. 205 (Type locality: 'America australe.' Note: obviously incorrect, probably from Cape of Good Hope).
- Trapelus hispidus* Kaup, 1827, Isis, p. 616, pl. VII. Gravenhorst, 1833, Nova Acta Ac. Leop. Carol. XVI, p. 917, pl. LXIV, figs. 1—8.
- Agama hispida* Boulenger, 1885, Cat. Liz., I, p. 349 (Cape of Good Hope). Hewitt & Power, 1913, Trans. Roy. Soc. S. Afr., III, p. 150 (Somerset Strand). Rose, 1926, Ann. S. Afr. Mus., XX, p. 492 (Cape Peninsula), and 1929, Veld & Vlei, p. 96, text-fig. 60. Smithers, 1937, Cape Naturalist, I, p. 114 & text-fig.
- Agama hispida* part., Peters, 1870, Monatsb. Ak. Wiss. Berlin, p. 112. Boettger, 1887, Ber. Senck. Naturf. Ges., p. 141 (Malmesbury). Gough, 1909, Ann. Tvl. Mus., I, p. 188, pl. XX, figs. 1—3 (Cape Colony; Stellenbosch). Boulenger, 1910, Ann. S. Afr. Mus., V, p. 464 (Cape Division; Worcester).
- Agama hispida* forma *typica* Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 236 (Eerste River; Claremont; Cape Flats; Calvinia; Hondekliip Bay; Somerset Strand).
- Agama spinosa* (non Gray) Dumeril & Bibron, 1837, Erp. Gen., IV, p. 502, pl. XLI bis, fig. 2.

Description: Head convex, subcordiform, usually a little broader than long (to occiput), length from 4 (in males) to $4\frac{1}{2}$ (in females) times into length from snout to vent. Snout very short and rounded. Nostril directed outwards, pierced in a more or less convex nasal shield below the very short canthus rostralis. Diameter of ear-opening much less (from a third to a half) than cleft of closed eye. Scales on head unequal in size, strongly keeled or subconical, usually with 1—3 scales in the middle of the forehead enlarged and trihedral; 9—13 (usually 11) scales between supraciliary ridges; occipital enlarged and encircled by sharply conical keeled scales; pineal foramen large and sunk in a crater-like pit; 12—16 (usually 13—14) upper labials; 2—4 (usually 3) rows of scales between labials and nasal shield. Body very stout and depressed, covered above with moderately large, imbricate, strongly keeled and often distinctly mucronate scales, intermixed with enlarged coarsely spinose scales (spines usually directed upwards or recurved), irregularly scattered over back or forming indefinite longitudinal rows; dorsolateral scales with keels directed obliquely inwards towards the vertebral line; small groups of spinose scales on sides of neck and behind ear-opening; 70—85 scales round middle of body; a vertebral series of more or less enlarged keeled scales forms a low but distinct dorsal crest on nape and back, disappearing on tail. Ventrally, scales more or less distinctly keeled and mucronate. Limbs moderately elongate, with enlarged spinose scales above; adpressed hindlimb reaches as far as shoulder or neck; length of hand equal to depth of head; fingers and toes short, 3rd finger longer than 4th; 3rd toe longer than 4th, 5th not extending as far as 1st; tibia as long as or a little shorter than head or foot, covered above with unequal-sized scales; toes with terminal scale at base of claw above, uni- or tricarinate, not or only slightly longer than those proximally; subdigital lamellae spinose, 12—16 in a longitudinal series under 3rd or 4th toe. Tail cylindrical, slender, usually a little longer than head and body in males, slightly shorter in females; covered with strongly keeled mucronate imbricate scales. A single row of preanal pores (often somewhat small and indistinct) in males, averaging about 10 in number.

Colour: Above green, olive or brown, often more or less uniform in adult males or with indistinct darker or lighter variegations; in

females and young males there are 4–5 transverse series of large squarish dark green, brown, purple or black spots or crossbands on back; dark crossbars also on limbs and tail. Below, males are bluish grey to greenish blue, darker on chin and throat; females and young males are yellowish white to pale greenish below, uniform or with a wide-meshed network of cloudy grey, greyish blue or blackish over throat, chest and belly.

Dimensions: Male (S.A.M. 3949—Cape Flats), H. & B. 96, tail 116, length head 24.5, breadth head 24.5, forelimb 48, hindlimb 62.5 mm. Female (S.A.M. 14509—Calvinia), H. & B. 95.5, tail 90, length head 24.4, breadth head 23.8, forelimb 45, hindlimb 53.5 mm.

Field notes: Terricolous and confined for the most part to the sandy low-lying dune areas of the western and south-western Cape Province. Comparatively slow-moving, living in holes under large tufts of grass, small bushes and shrubs, but nowhere common. Diet consists mainly of small sand living beetles, ants and vegetable matter.

Distribution: Western and south-western Cape Province. Recorded localities: Cape Flats; Goodwood; Claremont. Calvinia; Hondeklip Bay; Garies (S.A.M.). Somerset Strand (K.M.). Cape Town; Wellington (A.M.). Tulbagh (A.M., N.M. & R.M.). Worcester (A.M. & S.A.M.).

Remarks: Type in the Stockholm Museum?

AGAMA HISPIDA BRACHYURA Boulenger.

Namaqua Spiny Agama.

Agama brachyura Boulenger, 1885, Cat. Liz., I, p. 350, pl. XXVIII, fig. 1 (Type locality: Cape of Good Hope). Fischer, 1888, Mittl. Mus. Hamburg, p. 12 (Aus). Boulenger, 1903, Ann. Mag. Nat. Hist. (7) XII, p. 217 (Deelfontein), and 1905, P.Z.S. Lond., II, p. 252 (Klipfontein; Port Nolloth). Roux, 1907, Zool. Jahrb. Syst., XXV, p. 414 (Matjesfontein; Steinkopf; Jakhalswater). Gough, 1909, Ann. Tvl. Mus., I, p. 188, pl. XIX, figs. 1 & 2. Boulenger, 1910, Ann. S. Afr. Mus., V, p. 465 (Little Namaqualand; Beaufort West; Calvinia; Matjesfontein; O'okiep; Worcester). Werner, 1910, Jena. Denkschr., XVI, p. 318 (Kubub). Lampe, 1911, Jahrb. Nassau. Ver. Naturk., LXIV, p. 159 (Kuibis). Loveridge, 1936, Field Mus. Nat. Hist. Zool. Ser., XXII, p. 52 (Kleinsee).

Agama hispida var. *brachyura* Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 239 (Springbok; Ograbis; Anenous; Grassmund; Kuboos; Driekoppen nr. Hanover).

Agama hispida brachyura Power, 1933, Trans. Roy. Soc. S. Afr., XXI, p. 215 (Kleinsee). FitzSimons, 1933, Ann. Tvl. Mus., XV, p. 530 (nr. Hondeklip Bay; btwn. Kuboos & Lekkersing; Soebatsfontein). Hewitt, 1937, Guide Vert. Fauna E. Cape Prov. S. Afr., II, p. 25 (Beaufort West; Plaatjesfontein nr. Hanover). FitzSimons, 1938, Ann. Tvl. Mus., XIX, p. 188 (btwn. Port Nolloth & Klipfontein; nr. Kamaggas).

? *Agama hispida* part., Werner, 1910, Jena. Denkschr., XVI, p. 317 (Steinkopf).

Description: Distinguishable from typical *hispida* as follows: Head from $3\frac{1}{2}$ to 4 times into length from snout to vent. Nostril directed outwards and upwards, pierced on or just below the short canthus rostralis. Body very much depressed and squat; dorsal scaling very coarse, with enlarged spinose scales arranged in 3–4 more or less regular longitudinal series on either side of vertebral line; 80–92 scales round middle of body; dorsal crest low but distinct on nape, feebly developed or interrupted on back, absent on tail. Head scales moderately keeled, sometimes smooth on snout and supraorbital region; 11–15 (usually 13) scales between supraciliary ridges; upper labials 11–15 (usually 13) in number; 3–5 (usually 4) rows of scales

between labials and nasal shield. Gular and ventral scales smooth or feebly keeled and shortly mucronate. Length of hand equal to or greater than depth of head; 4th toe longer than or subequal to 3rd; subdigital scales in a longitudinal series of 14—18 under 3rd toe. A single row of 10—12 rather small preanal pores in males.

Colour: Adult females are yellowish-, greyish- to reddish-brown or dull tangerine above, with 4—5 transverse series of large dark brown to blackish, oval to squarish spots on back, interspaced with somewhat irregular blotches of slate grey and X- or V-shaped yellowish markings along vertebral line; darker and lighter transverse bars or chevrons across top of head between the eyes, and a U-shaped bar round back of occipital; limbs and tail with dark crossbars; below, white, creamy to greyish white, with dull bluish, greenish or greyish vermiculations or a network design, which is distinctly marked on throat, but usually faint or absent on belly. Adult males are verdant green, olive to dark slate grey above, with transversely arranged darker spots on back often ill-defined; enlarged scales dirty yellow; limbs and tail with dark barring; below, yellow, yellowish green to pale olive or bluish grey, throat uniformly suffused with dark green, bluish grey or black, and sometimes duller patches of the same colour on chest and belly.

Dimensions: Male (T.M. 17904—Klipfontein), H. & B. 114, tail 123, length head 32.5, breadth head 32.5, forelimb 54.5, hindlimb 76 mm. Female (T.M. 15991—Lekkersing), H. & B. 115, tail 100, length head 29, breadth head 29, forelimb 52, hindlimb 66 mm.

Field notes: Habits similar to those of typical *hispida*. The females, when full of eggs, are very sluggish and fond of basking on the hot sand, where they will remain unmoved until closely approached. The eggs are large and oval, measuring from 18—20 × 12—13 mm.; usually about 18 are laid at a time in holes in the ground. Stomach contents consist mainly of ground running beetles, together with caterpillars and occasionally centipedes; parasitic round worms usually present in the stomach and gut.

Distribution: Little Namaqualand, extending north into Great Namaqualand, east to Hanover District and south to the south-western Cape Province. Recorded localities: Plaatjesfontein; Beaufort West (A.M.). Kimberley (A.M. & N.M.). Steinkopf (A.M., N.M. & S.A.M.). Kleinsee; Driekoppen (K.M.). Kuboos (K.M. & S.A.M.). Aus (K.M., S.A.M. & T.M.). Anenous (N.M. & S.A.M.). Port Nolloth (N.M., S.A.M. & T.M.). Klipfontein; Bitterfontein; Ograbis; Grassmund; Springbok; Worcester; Nelspoort; Calvinia (S.A.M.). Port Nolloth—Klipfontein; Matjesfontein (S.A.M. & T.M.). Orangemund; Kuboos—Lekkersing; Hondeklip Bay; Lekkersing; nr. Kamaggas; Soebatsfontein; Vredendal; Bothaville (T.M.).

Remarks: Types in the British Museum of Natural History.

AGAMA HISPIDA DISTANTI Boulenger.

Distant's Spiny Agama.

Agama aculeata (non Merrem) Boettger, 1889, Ber. Senck. Naturf. Ges., p. 287 (Botschabelo nr. Middelburg, Tvl.).

Agama hispida Boulenger, 1892, in Distant, Naturalist in the Tvl., p. 174 (Pretoria). Werner, 1896/98, Jahresb. Ver. Magdeburg, p. 140 (Transvaal). Sternfeld, 1911, Mittl. Zool. Mus. Berlin, V, p. 419 (Mpoma, Tvl.; Bethany, O.F.S.).

Agama distanti Boulenger, 1902, Ann. Mag. Nat. Hist. (7) IX, p. 339 (Type locality: Pretoria; Rustenburg). Roux, 1907, Zool. Jahrb. Syst., XXV, p. 413. Boulenger, 1907, P.Z.S. Lond., II, p. 484 (Woodbush).

Agama distanti part., Boulenger, 1910, Ann. S. Afr. Mus., V, p. 465 (Burghersdorp; Smithfield; Kroonstad; Vredfort Road; Krugersdorp; Johannesburg; Mashonaland). Hewitt & Power, 1913, Trans. Roy. Soc. S. Afr., III, p. 151 (Mochudi; Baralong Farms; Mafeking; Madibi).

- Agama hispida* var. *distanti* Gough, 1909, Ann. Tvl. Mus., I, p. 189, pl. XXI, figs. 1—3 (Waterberg; Irene; Brandfort; Krabbefontein; Lydenburg; Selati; Waterval Onder). Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 243 (Barberton; btwn. Wolmaransstad & Bloemhof; Tweespruit; Bulawayo; Mazoe, etc.).
- Agama hispida* *distanti* Chubb, 1909, P.Z.S. Lond., p. 593 (Bulawayo). Power, 1927, Trans. Roy. Soc. S. Afr., XIV, p. 406 (Lobatsi), and 1931, XX, p. 41 (Linokana). FitzSimons, 1935, Ann. Tvl. Mus., XVI, p. 342 (Gabani; Molepolole; Wankie).
- Agama hispida* part., Gough, 1909, Ann. Tvl. Mus., I, p. 188 (Waterval Onder). Boulenger, 1910, Ann. S. Afr. Mus., V, p. 464 (Kroonstad).

Description: Length of head $3\frac{1}{2}$ to $4\frac{1}{4}$ times into length from snout to vent. Nostril directed outwards or upwards and outwards, pierced in a convex nasal shield on or just below the canthus rostralis. Diameter of ear-opening equal to or a little greater than cleft of closed eye. Scales on head unequal, more or less strongly keeled (exceptionally smooth); 3—5 scales on middle of snout much enlarged; 12—16 scales between supraciliary ridges; 11—16 upper labials; 2—4 rows of scales between labials and nasal shield. Scales on back rough, very small (smaller than in typical *hispida* or *brachyura*) and strongly keeled (mucronate only low down on the sides of body), intermixed with enlarged spinose scales which are often arranged in longitudinal series; 85—115 (seldom less than 90) scales round middle of body; dorsal crest very low but distinct on nape, faint or absent on back, absent on tail. Gular and ventral scales smooth or feebly keeled, not or but slightly mucronate towards the sides. Length of hand equal to or a little less than depth of head; tibia a little shorter or longer than head, as long as or slightly shorter than foot, covered above with very unequal scales; 3rd toe longest or exceptionally 3rd and 4th equal; 12—19 scales in a longitudinal series under 3rd toe. Tail cylindrical, slender, a little longer or shorter than head and body. A single row of rather small, often indistinct preanal pores in males, usually 10—14 in number, occasionally a second row present.

Colour: Above grey, olive, brown or blackish, with a yellowish vertebral band from occiput to root of tail (sometimes continued interruptedly over basal portion of latter), usually divided longitudinally over back by a thin dark broken line along median vertebral scale row; back may be uniform in colour or with series of large squarish dark brown spots on either side of vertebral stripe; head above, often with darker and lighter symmetrical transverse bars or chevrons between eyes. Lower surfaces creamy white, yellowish or pale reddish brown; males with bluish to blackish wavy longitudinal lines or vermiculations on throat, together with a large spot of the same colour at base of throat; in females vermiculations only present, though sometimes very faintly marked or absent.

Dimensions: Male (T.M. 2299—Pretoria), H. & B. 80, tail 87, length head 21.5, breadth head 21.5, forelimb 33, hindlimb 48.5, foot 17 mm. Female (T.M. 263—Selati), H. & B. 94, tail 82, length head 22.8, breadth head 22.9, forelimb 37, hindlimb 47, foot 16 mm.

Field notes: Mainly terricolous but also partly arboreal, usually found running about on the ground in the sun over the open highveld and sandy thornbush country. When alarmed they will usually only run (with belly well off the ground and the tail raised high in the air) a short distance before squatting down flat until disturbed again. The eggs, about 14 in number and measuring $15-18 \times 10-13$ mm., are laid during early summer and buried in the ground by the female. A distinct preference is shown for ants, though crickets, grasshoppers, cockroaches and beetles are all readily taken; often heavily infested with cestode worms.

Distribution: From the north-central Cape Province, northwards through the Orange Free State and Transvaal to Southern Rhodesia and westwards to the eastern border of the Kalahari. Recorded localities: Potchefstroom; Empanjeni; Chilimanzi; Driefontein; Kutamas (A.M.). Bloemfontein (A.M., B.M. & K.M.). Doornkop nr. Belfast; Nylstroom (A.M. & T.M.). Hebron (B.M.). Steynsburg; Hanover; Britstown; Mafeking; Devondale; Umvoma; Taungs; Towani; Thabanchu; Glen; Linokana; Lobatsi; Serowe; Barolong Farms; Pienaar's River; Rayton; Premier Mine; Francistown; Plumtree (K.M.). Bulawayo (K.M., N.M., R.M. & S.A.M.). Kroonstad (K.M. & S.A.M.). Vryburg; Pretoria (K.M. & T.M.). Umsengeri River (R.M.). Windsorton Road; Burgheersdorp; Vredefort Road; Smithfield; Junction Marico & Crocodile Rivers; Krugersdorp; Kendal; Salisbury; Chishawasha; Bindura; Mazoe; Mochudi (S.A.M.). Brandfort; Parys; Odendaalsrust; Irene; Johannesburg; Ermelo; Rustenburg; Koster; Heidelberg, Tvl.; Brits; Vygeboompoort, Palala River & Vaalwater, Waterberg Dist.; Waterval Onder; Selati; Lydenburg; Barberton; Carolina; Potgietersrust; Pietersburg; Woodbush; Haenertsburg; Krabbefontein; Shilowane; Metlepetsi River; Letsitele Sdng.; Leydsdorp; Bantolierkop; Wilhanshohe; Great Saltpan; Sand River; Lundie River; Wankie (T.M.).

Remarks: Types in the British Museum of Natural History.

AGAMA HISPIDA MAKARIKARICA FitzSimons.

(Plate XIX, fig. 3).

Makarikari Spiny Agama.

Agama hispida makarikarica FitzSimons, 1932, Ann. Tvl. Mus., XV, p. 36, and 1935, XVI, p. 342 (Type locality: Makarikari Saltpan, B.P.).

Description: Closely allied to *Agama h. distantii*, but distinguishable on the following: Head strongly convex, as broad as long, its length from $3\frac{1}{2}$ to $3\frac{3}{4}$ times into length from tip of snout to vent. Nostril directed outwards and upwards, pierced in a slightly convex nasal shield on the canthus rostralis. Diameter of ear-opening not more than half the length of cleft of closed eye. Scales on head unequal, rugose but not strongly keeled; 13 scales between supraciliary ridges; 10–12 upper labials; 2–4 (usually 3) rows of scales between upper labials and nasal shield; orbital lobes very prominent. Enlarged scales on back rather widely spaced and arranged in 3–4 regular longitudinal series on either side of back; 80–90 scales round middle of body; vertebral crest low but distinct on nape and back, absent on tail. Gular and ventral scales not or but feebly keeled, slightly mucronate towards the sides and posteriorly. Limbs short and stout; adpressed hindlimb reaches to shoulder or just beyond; length of hand distinctly less than depth of head; 3rd finger longest; tibia shorter than head, subequal to foot, covered above with slightly unequal-sized scales; 3rd toe much longer than 4th, 5th extending not nearly as far as 1st; 12–14 scales in a longitudinal series under 3rd toe. Tail slightly longer than head and body in males, a little shorter in females. A single row of 10–12 rather small preanal pores in males.

Colour: Above light grey to dark grey or greyish brown, uniform or with a series of four large squarish dark brown to blackish spots arranged in transverse pairs on either side of back; a distinct yellowish vertebral streak from occiput to root of tail, present or absent; two dark brown chevron-shaped bars across head between the eyes; a dark bar from posterior corner of eye to just above ear-opening, and another from lower edge of eye to ear; pineal pit light

brown; bright orange-yellow blotches on either side of neck between head and shoulder, in armpit and groin; cheeks and lips bright blue in males. Lower surfaces white to pale yellowish with blackish vermiculations on throat, extending sometimes over chest on to belly.

Dimensions: Male (T.M. 14451), H. & B. 66, tail 76, length head 18, breadth head 18, forelimb 31, hindlimb 40, foot 16.2 mm.

Field notes: Terricolous, and confined to open dry flats of hard-baked lime-impregnated ground, supporting a scattered type of small salt-bush, under which they have their burrows. Their diet appears to consist almost exclusively of small tenebrinoid beetles.

Distribution: Known only from the type locality, viz. the north-eastern edge of the Makarikari Saltpan, near the outlet of the Nata River, Bechuanaland Protectorate.

Remarks: Type in the Transvaal Museum, Pretoria.

AGAMA HISPIDA ACULEATA Merrem.

(Plate XIX, fig. 5).

Kalahari Spiny Agama.

?*Agama aculeata* Merrem, 1820, Tent. Syst. Amph., p. 53 (Type locality: 'Cape of Good Hope').

(Note: Other localities are included in the records from the South Gray, 1845, Cat. Liz., p. 257. A. Smith, 1849, Ill. Zool. S. Afr. Rept. App., p. 14. Boulenger, 1885, Cat. Liz., I, p. 351. Fischer, 1888, Mittl. Mus. Hamburg, p. 12 (Aus). Boettger, 1894, Ber. Senck. Naturf. Ges., p. 89 (Rehoboth). Boulenger, 1902, P.Z.S. Lond., II, p. 16 (Mashonaland), and 1903, Ann. Mag. Nat. Hist. (7) XII, p. 517 (Deelfontein). Werner, 1902, Verh. Zool.-bot. Ges. Wien, p. 338 (Windhoek). Roux, 1907, Zool. Jahrb. Syst., XXV, p. 415 (Orange River; Jakhalswater). Werner, 1910, Jena. Denkschr., XVI, p. 318 (Vlei Topan, Lokanong-Severelela, Lehututu & Mookane, Kalahari; Kubub; Keetmanshoop). Hewitt & Power, 1913, Trans. Roy. Soc. S. Afr., III, p. 151 (Ky Ky; Nosop River; Lower Molopo; Wildehonde Pan; Upington; Kimberley; Fort Richmond). Werner, 1915, in Michaelsen, Land-u. Süsswasserfauna Deutsch-S.W. Afr., I, p. 337 (Neudamm; Windhoek; Karibib). Power, 1917, S. Afr. Journ. Sci., XIV, p. 263 (Kimberley). Rose, 1929, Veld & Vlei, App., p. 217. Cott, 1934, P.Z.S. Lond., p. 149 (Mortimer).

Agama hispida var. *aculeata* Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 252 (Ladysmith; Okwa & Tango, Bech. Prot.; etc. etc. Note: Other localities are included in the records from the South African Museums).

Agama hispida aculeata Power, 1933, Trans. Roy. Soc. S. Afr., XXI, p. 215 (Orange River Station; De Aar; Prieska; Marydale; Kenhardt; Upington). FitzSimons, 1935, Ann. Tvl. Mus., XV, p. 530 (Nosop & Oup Rivers; Kuruman; Pofadder), and XVI, p. 344 (Molepolole-Kuke Pan, Kuke Pan—Gomodimo Pan, Kaotwe & Damara Pans, Kalahari; Gemsbok Pan; Sunnyside—Machumi Pan; Mabeleapudi; Lake N'gami; Maun; Shorobe; Shaleshonto; Kwaai; Zweizwe River; N'kate). Parker, 1936, Novit. Zool., XL, p. 131 (Omongongua; Windhoek; Hoffnung; west of Mariental). Mertens, 1937, Abh. Senckb. Naturf. Ges., 435, p. 7 (Windhuk). Hewitt, 1937, Guide Vert. Fauna E. Cape Prov. S. Afr., II, p. 24, pl. IX, fig. 4 (Longhope; Ripon; Graaff-Reinet; Cradock). Mertens, 1937/38, Veröff. Deutsch. Kolon.u. Übersee Mus. Bremen, II, hft. 1, p. 11 (Luderitzbucht). FitzSimons, 1938, Ann. Tvl. Mus., XIX, p. 188 (Okosongomongo; Lake Otjikoto—Nakusib; Lake Guinas; Namutoni—Ondonga; Oshikango; Itota Dune; Okaukuejo—Outjo; Kamanyab; Kalkveld; Neudamm; Sinclair Mine; Barby; Brandvlei; Van Wyksvlei).

Agama aculeata part., Boulenger, 1910, Ann. S. Afr. Mus., V, p. 465 (Burghersdorp; Kuruman; De Aar). Methuen & Hewitt, 1914, Ann. Tvl. Mus., IV, p. 136 (Wasserfall, Kraikluft, Sandmund, Grundoorn—Nakeis & Narudas Süd, Great Karasberg Dist.).

Trapelus (*Psammorrhhoa*) *bibronii* Fitzinger, 1843, Syst. Rept., p. 81.

Agama infralineata Peters, 1877, Monatsb. Ak. Wiss. Berlin, p. 613 (Otjimbingue).

- ?*Agama armata infralineata* Matschie, 1890, Jahrb. Syst., V, p. 607 (Mpome, Tvl.).
- Agama pulchella* Bocage, 1896, Jorn. Sci. Lisb. (2) IV, p. 116 (Modder River, O.F.S.). Geugh, 1909, Ann. Tvl. Mus., I, p. 191.
- Agama hispida* part., Werner, 1910, Jena. Denkschr., XVI, p. 317 (Mafeking; Kooa & Mashoning, Kalahari; Okahandja). Sternfeld, 1911, Fauna Deutsch. Kolon., IV, 2, p. 19 (S.W. African & Kalahari locs.).
- Agama armata* (non Peters) Fischer, 1888, Jahrb. Hamb. Wiss. Anst., V, p. 12 (Aus). Werner, 1915, in Michaelsen, Land-u. Süsswasserfauna Deutsch.-S.W. Afr., I, p. 337 (Okahandja; nr. Neudamm; Windhoek; Avasbergen; Swakopmund; Tsumeb; Okavango).
- Agama hispida* (non Linnaeus) Sternfeld, 1911, Mittl. Zool. Mus. Berlin, V, p. 398 (Outjo; Windhoek—Okahandja; Nauchas; Warmbad; Okowa-kuatjiwi; Karasberge). Nieden, 1913/14, Sitzb. Ges. Naturf. Fr. Berlin, No. 10, p. 450 (Rehoboth).
- Agama atra* part., Methuen & Hewitt, 1914, Ann. Tvl. Mus., IV, p. 135 (Btwn. Grundoon & Wasserfall).
- Agama hispida armata* part., Cott, 1934, P.Z.S. Lond., p. 149 (Mortimer).

Description: Head as long as broad, length from $3\frac{1}{3}$ to $4\frac{2}{3}$ times into length from snout to vent. Snout often somewhat pointed in old male specimens. Nostril directed outwards and pierced in a convex nasal shield on or just below canthus rostralis. Diameter of ear-opening equal to or a little less than cleft of closed eye. Scales on head unequal, smooth or feebly keeled, often the last one or two rows of scales across back of head enlarged and subconical; occipital enlarged, not or but feebly pitted; 10—15 (usually 12—14) upper labials; 2—4 rows of scales between labials and nasal shield. Body more depressed than is usual in *Agama h. armata*; scales on back strongly keeled and for the most part shortly mucronate; intermixed with enlarged strongly mucronate scales which are disposed in three (exceptionally four) longitudinal series down either side of vertebral line (very occasionally enlarged scales are irregularly scattered); 75—100 scales round middle of body; groups of spinose scales on sides of neck and round ear-opening; vertebral crest low but distinct, more elevated on nape than on back, and usually continued at least over anterior portion of tail. Gular and ventral scales usually smooth, occasionally feebly keeled in adults and often quite distinctly so in young specimens, not or but feebly mucronate. Adpressed hindlimb may reach to anywhere between shoulder and ear-opening; length of hand equal to or a little greater than depth of head; fingers moderate 3rd longest or 3rd and 4th subequal; tibia equal to or a little shorter (exceptionally a little longer) than head, shorter than foot and covered above with more or less equal-sized scales; 4th toe usually longer than 3rd, sometimes equal to or slightly shorter, 5th extending as far as or a little further than the 1st; 15—20 scales in a longitudinal series under 3rd or 4th toe. Tail cylindrical and moderately slender, from $1\frac{1}{8}$ to $1\frac{3}{8}$ times length of head and body, longer in males than in females. A single row of 9—14 rather small preanal pores in males, occasionally a double row present.

Colour: Above pale yellowish to dark brown or greyish, sometimes uniform, but more usually with a row of 4 dark brown to blackish spots or blotches on either side of back (on excitation these spots often turn to blood red), or a series of 5—6 irregular wavy transverse bars across back; a pale vertebral streak often present from occiput to root of tail; two dark bars across head between the eyes, or a pale chevron between the eyes and a transverse bar across forehead in front of eyes, present or absent; top and sides of head in adult males olive to bluish green or blackish. Limbs and tail above, with dark crossbars, often indistinct or absent in old specimens. Lower surfaces whitish, usually with greenish, blue, brick red to blackish wavy longitudinal lines on throat, often extending

as a fainter network over chest and belly; a dark bluish to blackish spot or blotch at base of throat in males, or often throat entirely suffused. During the breeding season adult males often take on a brick red colouration over neck, chest and sides of body, while the head becomes a bright blue.

Dimensions: Male (T.M. 3109—Kraikluft), H. & B. 110, tail 156, length head 25, breadth head 25, forelimb 50, hindlimb 71, foot 28.5 mm. Female (T.M. 3110—Btwn. Nakeis & Grundoorn), H. & B. 103, tail 123, length head 24, breadth head 24, forelimb 48.5, hindlimb 61.5, foot 23 mm.

Field notes: Largely terricolous but often, especially during the mating season, taking to trees and shrubs where they may be seen conspicuously exposed to the sun among the topmost branches. Usually confined to the dry sandy thornveld type of country, where they live in holes in the ground, mainly those of burrowing animals, such as gerbilles, ground squirrels and springhares; also found living in deserted termite hills. Young specimens are very active and alert, but adults are more sluggish and when quietly approached will often remain quite still, relying on their protective colouration to evade detection. When really alarmed they will dart down any convenient hole, but being most inquisitive, will quickly reappear at the entrance and with head raised will stare fixedly at the intruder. During the breeding season the males are vividly coloured and, according to Hewitt & Power (1913, p. 152), develop a distinct hanging pouch from the throat. Fighting between rival males is not infrequent, and when roused the dorsal crest is raised to its maximum height and the gular fold considerably inflated. The colouring is remarkable for its brilliance and variability, responding rapidly to the stimulus of excitement and environment, while molestation usually tends to intensify the colours, especially in gravid females, where bright red blotches and spots appear on the back. During the cold winter months they creep away and hibernate in holes underground or under stones and in rock crevices, coming out only occasionally on warm days. Their diet is largely insectivorous and to a small extent herbivorous; a marked preference is shown for termites and diurnal harvesting ants, together with beetles, grasshoppers, caterpillars etc. The eggs, varying from 14—18 in number, are oval and average 14×10 mm.

Distribution: Throughout South West Africa and the Kalahari, extending southwards through the north-western Cape Province and the Karroo to the Albany District, eastwards to the north-western Orange Free State and northwards into southern Angola and Southern Rhodesia. Recorded localities: Windhoek; Grootfontein, Damaraland; Kobos; Keetmanshoop; Ripon; Fish River Valley, Albany Dist.; Victoria West; Graaff-Reinet; Halesowen; Serowe; Driefontein; Rusape (A.M.). Ky Ky; Vryburg; Rietfontein; Plumtree (A.M. & K.M.). Kimberley (A.M., K.M., R.M. & T.M.). Kuruman (A.M., K.M., S.A.M. & T.M.). Beaufort West (A.M., S.A.M. & T.M.). Cradock; Hopetown (A.M. & T.M.). Albrechts; Lower Molopo; Ababas Nauzerus; Witsands; Wildehonde Pan; Swart Modder; Danielskuil; Upington; Putsonderwater—Koegas; Dragoender—Marydale; Witputs; Prieska; Niekerkshoop; Griquatown; Delport's Hope; Riverton; Modder River Station; Postmasburg; Dry Harts Siding; Campbell; Warrendale; Magersfontein; Genesa; Douglas; Setlagoli; Taungs; Orange River Station; Honeyestkloof; Tygerkop; Fort Richmond; Spreeuwfontein; Vanderbylskraal; Boshof; Jagersfontein; Jacobsdal; Mochudi; Ramathlabama; Mahalapye (K.M.). Bulawayo (K.M. & R.M.). Gobabis; De Aar (K.M. & S.A.M.). Namakunde; Otjitambi; Kowares; Outjo;

Otjitondua; Kaross; Kaoko Otavi; Otjikondo—Kamanyab; Onolongo; Otjiwarongo; Aminuis; Maltahohe; Kalkfontein, G.N.; Areb; Friersdale; Krantzkop & Vaalhoek, north bank Orange Riv.; Narugas; Langklip; Bakputs; Burghersdorp; O'okiep; Albany; Uniondale; Keimoes; Hughes; Importuni (S.A.M.). Waterberg, Damaraland; junction Oup & Nosop Rivers (S.A.M. & T.M.). Oshikango; Etosha Pan; Namutoni—Ondonga; Otjikoto—Nakusib; Kalkveld; Okahandja; Okosongomingo; Neudamm; Barby; Sinclair Mine; Wasserfall; Kraitkluft, Grundoorn & Grundoorn—Nakeis Mine, Gt. Karasberg Dist.; Kuibis; Oup River; Kakamas; Pofadder; Brandvlei; Van Wyksvlei; Fourteen Streams; Strydenburg; Nelspoort—Murraysburg; Aberdeen—Graaff-Reinet; Hanover—Philipstown; Kuke; Gomodimo, Kaotwe & Damara Pans, Kalahari; Sunnyside—Machumi Pan; Mabeleapudi; Lake N'gami; Shorobe; Shaleshonto; Zweizwe River; N'kate (T.M.).

Remarks: Types (of Dumeril & Bibron) in Paris Museum. According to Boulenger & Power (1921, p. 252), it is doubtful if Merrem's *A. aculeata* is applicable to this form, and it is thus possible that Merrem's description was made from a specimen of typical *hispida*.

AGAMA HISPIDA ARMATA Peters.

Peters' Spiny Agama.

Agama armata Peters, 1854, Monatsb. Ak. Wiss. Berlin, p. 616 (Type locality: Sena & Tete, Mozambique), and 1855, Arch. Naturg., I, p. 45, and 1882, Reise n. Mossamb., III, p. 42, pl. VII, fig. 2. Boulenger, 1885, Cat. Liz., I, p. 352 (Natal), and 1905, P.Z.S. Lond., II, p. 252 (Hluhluwe). Roux, 1907, Zool. Jahrb. Syst., XXV, p. 415 (Ladysmith). Boulenger, 1908, Ann. Natal Mus., I, p. 224 (Eshowe; Entendweni; Kwambonambi; Indukuduku). Odhner, 1908, Ark. Zool. Stockholm, IV, No. 18, p. 3 (Somkele; Lake Sibayi). Gough, 1909, Ann. Tvl. Mus., I, p. 190.

Agama hispida var. *armata* Boulenger & Power, 1921, Trans. Roy. Soc. S. Afr., IX, p. 261 (Gazaland; Lourenco Marques; Mariannhill; Bulawayo; Rikatla; Serowe; Plumtree; Marandellas; Salisbury; Rankins Pass; White River; Weenen; Carolina; Barberton; Vygeboompoort; Lydenburg; Great Letaba River; Mazambo; Leydsdorp; Chishawasha).

Agama hispida armata Loveridge, 1933, Bull. Mus. Compar. Zool., LXXIV, p. 296 (East African locs.). FitzSimons, 1935, Ann. Tvl. Mus., XVI, p. 345 (Figtree). Hewitt, 1937, Guide Vert. Fauna E. Cape Prov. S. Afr., II, p. 25 (Emfundisweni). FitzSimons, 1939, Ann. Tvl. Mus., XX, p. 28 (Birchenough Bridge).

Agama hispida armata part., Cott, 1934, P.Z.S. Lond., p. 149 (Charre; Caia; Amatongas).

Agama hispida part., Gough, 1909, Ann. Tvl. Mus., I, p. 188 (Lydenburg). Boulenger, 1910, Ann. S. Afr. Mus., V, p. 464 (Durban).

Agama distanti part., Boulenger, 1910, Ann. S. Afr. Mus., V, p. 465 (Delagoa Bay). Hewitt & Power, 1913, Trans. Roy. Soc. S. Afr., III, p. 151 (El Dorado; Marandellas).

Agama aculeata part., Boulenger, 1910, Ann. S. Afr. Mus., V, p. 465 (Durban; Bulawayo; Salisbury; Livingstone).

Agama hispida distanti (non Boulenger) Loveridge, 1923, P.Z.S. Lond., p. 942, and 1924, Jour. E. Afr. & Uganda N.H. Soc., Suppl. 3, p. 10, and 1928, Proc. U.S. Nat. Mus., LXXIII, art. 7, p. 64 (East African locs.).

Description: Closely allied to *Agama h. aculeata*, but distinguishable on the following: Head longer than broad, in length from $3\frac{2}{3}$ to $4\frac{1}{3}$ times into length of head and body. Nostril pierced just below the very short canthus rostralis. Scales on head heterogeneous, keeled, with 2—4 (usually 3) on middle of snout more or less enlarged; 12—16 (usually 13) scales between supraciliary ridges; 10—13 (usually 10 or 11) upper labials on each side; 3—4 (usually 3) rows of scales

between labials and nasal shield. Form generally less stout and body less depressed than in *aculeata*. Dorsal scaling usually not so rough as in *aculeata*; scales on back strongly keeled and shortly mucronate, enlarged scales in 3—4 (rarely 2) more or less regular longitudinal series on each side of back (sometimes enlarged scales very few in number and scattered); 73—95 scales round middle of body; vertebral crest very low on nape, but more distinct on back. Gular and ventral scales usually keeled and mucronate, sometimes smooth or but feebly keeled. Adpressed hindlimb reaches to shoulder or as far as temple; length of hand greater than depth of head; fingers and toes more slender than in *aculeata*; tibia as long as or slightly shorter than head or foot, covered above with subequal-sized (rarely unequal) scales; 3rd and 4th toes equal or either slightly longer; 5th toe extending as far as or a little further than 1st, rarely not as far; 14—20 (average 17) scales in a longitudinal series under 3rd or 4th toe. Tail as in *aculeata*, but sometimes very slender in females. A single (seldom double) row of 10—14 (usually 12) preanal pores in males.

Colour: Above yellowish- to greyish- or reddish-brown, usually with 4—5 transverse series of paired dark brown to sepia spots or blotches on back; these spots or blotches often have their inner borders concave, thus enclosing a series of pale oval spots along the vertebral line; dark spots and blotches often irregular or absent in adult males; a pale continuous vertebral streak often present, especially in males; individual enlarged scales or small groups of scales often bright red or vermilion; head with two chevron-shaped bars between the orbits, or often blackish above and blue on the sides; limbs and tail usually barred with darker. Lower surfaces white to creamy, or greenish to greyish white, with bluish grey to blackish wavy longitudinal lines or a network design on chin and throat, and a bluish to black blotch at base of throat; occasionally traces of dark network extend over chest and belly.

Dimensions: Male (T.M. 2525—Giants Castle), H. & B. 82, tail 125, length head 20, breadth head 19, forelimb 33.5, hindlimb 47, foot 17 mm. Female (T.M. 3481—N'Wanedi River), H. & B. 88, tail 119, length head 21, breadth head 20, forelimb 42, hindlimb 56, foot 20 mm.

Field notes: Similar to *aculeata* in general habits. The eggs, usually 10—14 in number, measure from 13—15 × 9—10 mm. When available, harvesting ants (*Pheidole*) are eaten to the exclusion of all else, but when these are not obtainable beetles, grasshoppers, termites and other insects are eaten.

Distribution: An eastern form extending from Tanganyika Territory and Nyasaland, southwards through Portuguese East Africa and Southern Rhodesia to Natal and Pondoland, eastern and northern Transvaal. Recorded localities: Driefontein; Rusape; Mtoko; Kutamas; Musami; Bikita; Kwambonambi; N'tambanana; Emfundisweni; Estcourt; White River; Rankins Pass (A.M.). Mariannhill (A.M., K.M., R.M. & T.M.). Bulawayo (A.M., R.M. & S.A.M.). Chishawasha; Salisbury (A.M. & S.A.M.). Hluhluwe Drift (B.M.). Lydenburg (B.M. & T.M.). Rikatla; Marandellas; Eldorado (K.M.). Insiza (K.M. & S.A.M.). Margate; Clansthal; Krantzkop (N.M.). Indukuduku (N.M. & T.M.). Bindura; Mazoe (S.A.M.). Masiene; Barberton (S.A.M. & T.M.). Mazambo; Figtree; Birchenough Bridge; Eshewe; Weenen; Giants Castle; Tabamhlope; Mahlabatini; Leydsdorp; Brak River, E. Tvl.; N'Wanedi River; Vygeboompoort; Geelhoutkop; Carolina (T.M.).

Remarks: Types in the Berlin Museum.