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A REVIEW OF THE SOUTH AFRICAN  
CHEILODACTYLID FISHES  
(*PISCES : PERCIFORMES*),  
WITH DESCRIPTIONS OF TWO NEW SPECIES

By  
MARGARET M. SMITH

**A REVIEW OF THE SOUTH AFRICAN  
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WITH DESCRIPTIONS OF TWO NEW SPECIES**

With Plates 1 & 2

By  
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Those names in capitals are considered valid in this paper.

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# A REVIEW OF THE SOUTH AFRICAN CHEILODACTYLID FISHES (PISCES : PERCIFORMES), WITH DESCRIPTIONS OF TWO NEW SPECIES

With Plates 1 & 2

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Margaret M. Smith

## ABSTRACT

Two new species, *Cheilodactylus pixi* and *Chirodactylus jessicalenorum*, are added to the three known South African representatives of the Cheilodactylidae. *Palunolepis* is considered a junior synonym of *Chirodactylus*. Keys to the five species are given.

## INTRODUCTION

The family Cheilodactylidae is known from temperate waters of the southern hemisphere and in the Pacific Ocean (Japan, Hawaii and China). All five of the species recognized in this paper are endemic to South Africa. It is of interest to note that a related species, *Acantholatris monodactylus* (Carmichael, 1818) has been reported from Gough Island, Tristan da Cunha, Vema Seamount, St Paul and Amsterdam Island; but it does not occur in South African waters (Penrith, 1967; Hureau, 1969). Some cheilodactylids are common in tide pools and others extend down to at least 240 m. Some species are caught on lines and by bottom trawlers, but only *Chirodactylus grandis* is of slight commercial importance in South Africa.

## METHODS

Measurements less than 180 mm were made to the nearest 0.1 mm with dial calipers, those greater were made to the nearest 0.5 mm with dividers and a metre stick. All lengths of specimens are standard length (SL) unless indicated as total length (TL). Measurements and counts were made as defined by Hubbs and Lagler (1964) except for:

Lengths of dorsal and anal fin spines and rays measured from edge of body scaling (i.e. from the basal naked groove of the dorsal fin in *Chirodactylus*).

Base of spinous dorsal measured in a direct line from front of first spine to behind base of last spine; base of soft dorsal measured from front of first soft ray to end of fin. Pectoral fin counts are given from dorsal to the ventral: the uppermost, always simple, is differentiated from the next 7—9 which are normal divided rays, more or less subequal, connected by the membrane. These are followed by 4—7 simple, thickened, elongated rays joined basally by deeply incised membranes. Thus the count for the family is given as 1—2+7—9+4—7.

Predorsal bones and pterygiophore counts follow Ahlstrom *et al* (1976).

Paratypes of *Chirodactylus jessicalenorum* are deposited at the British Museum (Natural History)

(BMNH); South African Museum (SAM); and Western Australian Museum (WAM) and the B.P. Bishop Museum, Hawaii (BPBM), and the paratypes of *Cheilodactylus pixi* are deposited in the same institutions quoted above as well as in the National Museum of Natural History, Smithsonian Institution (USNM), the Muséum National d'Histoire Naturelle, Paris (NMHN) and the Australian Museum Sydney (AMS).

## CHEILODACTYLIDAE

Adults are characterised by having 4 to 7 lower pectoral rays simple, thickened and elongated, the longest often reaching to or beyond the vertical from the anus. Body compressed, oblong, with moderate to small scales. Mouth protractile, terminal to sub-terminal, small, with thick lips in adult. Maxilla exposed, no supramaxilla. Teeth small, villiform in several rows anteriorly in jaws, none on palatines or vomer. Preopercle not serrated; opercle without spines. Gill-membranes united, forming fold across isthmus. Gills 4, a slit behind 4th; pseudobranchiae present; gill-rakers 4—7 + 13—16. Single dorsal fin with 16—20 well developed heteracanth spines and 19—31 soft rays. Anal fin with three spines and 7—11 rays, anterior rays longest. Scaly sheath along base of dorsal and anal fins. Ventral fins inserted well behind base of pectorals. Caudal moderately forked with 8 + 7 principal rays, 13 being branched. Branchiostegal rays 6. Vertebrae 13—14 + 20—21 including hypural centrum. Gas bladder present or absent. Few pyloric caeca.

As stated above the enlarged lower pectoral rays are obviously a specialization in this family, but occasionally in *Cheilodactylus* the dorsal-most ray (of the lower 5 rays) is not enlarged and simple, but divided like the upper fin rays, leaving only 4 enlarged rays instead of 5. In the only case where *C. pixi* has 6 enlarged rays (on one side only) the extra ray occurs at the ventral edge of the fin. In *Chirodactylus* the specialization is apparently more stable, as the enlarged rays are 6—7, always simple and always enlarged. The extra (7th) ray occurs at the ventral edge of the fin and the dorsal-most enlarged ray does not revert to an ordinary divided ray.



Allen and Heemstra (1976) working on Australian material considered the present generic classification of this family to be unsatisfactory. They have included the following genera as junior synonyms of *Cheilodactylus*: *Clodactylus* Rafinesque 1815, *Pteronemus* Hoeven 1833, *Trichopterus* Gray 1854, *Chilodactylus* Günther 1860, *Acantholatris* Gill 1862, *Chirodactylus* Gill 1862, *Goniistius* Gill 1862, *Zeodrius* Castelnau 1879, and *Morwong* Whitley 1957.

Two genera have been recognised in South African waters: *Cheilodactylus* Lacépède, 1803 and *Palunolepis* Barnard, 1927. Both their type-species, *fasciatus* and *grandis* respectively, are South African endemics. Gill (1862) erected the genus *Chirodactylus* to include the type-species *antonii* Valenciennes, 1833; *variegatus* Valenciennes, 1833 (considered by de Buen (1959) to be the senior synonym of *antonii*) and provisionally, *grandis* Günther, 1860. Barnard was apparently unaware of this work when he made *grandis* the type-species of his new genus *Palunolepis*.

Norman in his (unpublished) "Draft synopsis of the orders, families and genera of recent fishes and fish-like vertebrates" places *Palunolepis* questionably in the synonymy of *Chirodactylus*. *Palunolepis* certainly fits all the criteria Norman uses in his key to differentiate *Chirodactylus* from the other genera.

Through the kind services of Mme Martine Desoutter of the Museum National d'Histoire Naturelle in Paris and Mrs Susan J. Karnella of the U.S. National Museum of Natural History in Washington D.C., I was able to examine specimens of the South American *Cheilodactylus variegatus* (Nos MNHN 9809 (labelled *antonii*); A 5247, A 4869, 8515 and 8514 from Chile and USNM 128057 and 128256 (2 specimens) from Peru. While *C. variegatus* (syn. *antonii*, the type of *Chirodactylus*) differs in obviously specific characters from the three South African species of *Chirodactylus*, it shares with these species the defining characters of the genus as listed in the key below. *Palunolepis* is thus a junior synonym of *Chirodactylus* and, based on a survey of the literature, *Chirodactylus* seems to contain only *C. variegatus*, and the three South African species.

#### General note re larvae

In recent work on cheilodactylid larvae and post larvae e.g. Dudnik 1977, the anal fin formula is generally given as two spines. This is not surprising as the anal fin of the adult of any of the South African species would at first sight appear to contain two well developed, conspicuous spines. The third spine is difficult to see, being generally slender and adnate to the first anal ray. In fact to measure it accurately one has to dissect it away from the ray to determine where it ends. It is therefore not unlikely that in the larval forms this spine is counted as a ray, giving two anal spines and a higher soft ray count than normal.

## KEY TO THE SOUTH AFRICAN GENERA

1. Three predorsal bones, with first two dorsal-fin spines articulating with first pterygiophore viz 0/0+0/2+1/1/1/1/ (Fig. 1A); postcleithrum covered by scales; 4—5 lower simple enlarged pectoral rays; scales small, about 80 in lateral line, 6 series in dorsal sheath and 3—4 rows along anal sheath; no naked groove between dorsal sheath and body scales; gas bladder absent in South African species.....*Cheilodactylus*
2. Two predorsal bones, with the two first dorsal-fin spines articulating with first pterygiophore viz 0+0/2+1/1+1/1/1 (Fig. 1B); postcleithrum scaleless; 6—7 lower pectoral rays simple, enlarged; scales moderate, 46—55 in lateral line, 1—3 rows in dorsal sheath and 1 row along anal sheath; naked groove between dorsal sheath and body scales; gas bladder present in South African species.....*Chirodactylus*

#### *Cheilodactylus* Lacépède, 1803

*Cheilodactylus* Lacépède, 1803 : 5 (Type-species: *Cheilodactylus fasciatus* Lacépède, 1803, by monotypy).

*Chilodactylus* Günther, 1860 : 78 (emendation of *Cheilodactylus*).

For other (non South African) probable junior synonyms see Allen and Heemstra (1976) except that here *Chirodactylus* and *Acantholatris* are considered valid.

For differentiation between *Chirodactylus* and *Cheilodactylus* see key above.

## KEY TO THE SOUTH AFRICAN SPECIES OF CHEILODACTYLUS

1. Dorsal soft rays 19—23, spinous dorsal base 1.9 times soft dorsal base; bars across body continuous, caudal fin uniform; scales with posterior skinny flaps giving ctenoid effect. Sublittoral, .....*pixi* n.sp.
2. Dorsal soft rays 23—25, spinous dorsal base 1.4—1.8 times soft dorsal base; anterior bars across body staggered at midline to give chess-board effect, caudal fin with dark oblique bars even in old preserved specimens; scales cycloid with smooth posterior margins. Intertidal and sublittoral.....*fasciatus* Lacépède, 1803

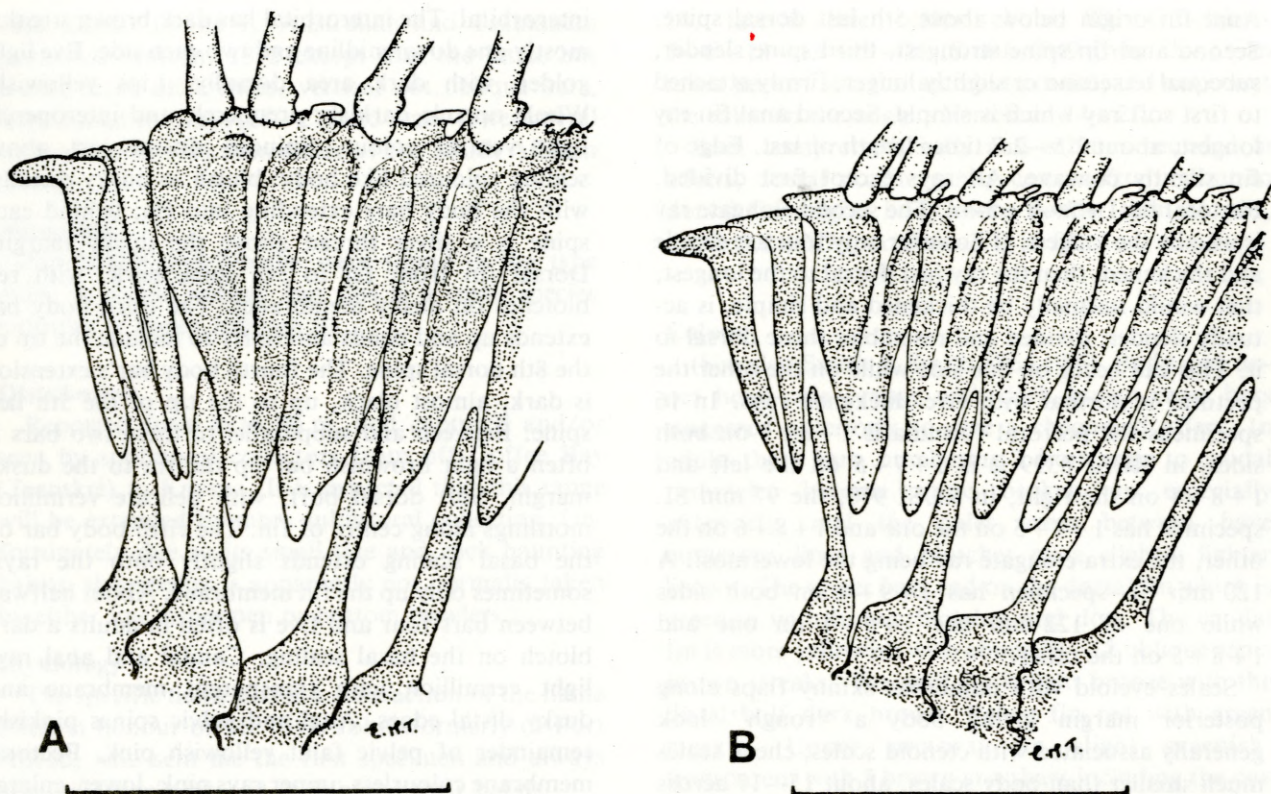
#### *Cheilodactylus pixi* n.sp.

Plate 1A & B

Barred fingerfin; balk-vingervin

*Cheilodactylus* sp. Smith, 1975 : 33 (common names only)





**Figure 1**

To show arrangement of anterior dorsal pterygiophores and predorsals of A. *Cheilodactylus*; B. *Chirodactylus*. The line in each case represents 5 mm.

#### Holotype

RUSI 702, 130 mm (TL = 160 mm) male with well developed testes caught in 60 m off Kowie River Mouth by Mr Pixie John.

#### Paratypes

RUSI 703, 45 mm (TL = 54 mm) juvenile regurgitated by *Atractoscion aequidens* (geelbek) caught in almost the same locality as holotype, presented by B. Connock. RUSI 8399, 75 mm (TL = 93 mm) juvenile collected by P. C. Heemstra *et al* using Pronoxfish in 15 m at Fountain Rocks off Kowie River Mouth. RUSI 8400, 53 mm (TL = 66 mm) found thrown up on beach east of Kowie River Mouth. RUSI 970, 9 specimens 85–132.5 mm (TL = 102–162 mm); AMS I21415-001, 85 mm (TL = 102 mm); BMNH 122 mm (TL = 145 mm), CAS 45331, 116 mm (TL = 142 mm); MNHN 1980–1097, 117.5 mm (TL = 144 mm); SAM 28936, 120 mm (TL = 144.5 mm) and SAM 28937, 85 mm (TL = 102 mm); USNM 221144, 125 mm (TL = 152 mm); WAM P26839-001, 125 mm (TL = 152 mm), collected by P. C. Heemstra, M. N. Bruton, M. Smale and R. E. Stobbs using rotenone off Roman Rock, Algoa Bay, in 20 m.

#### Diagnosis

Caudal uniform pale, all body bars continuous dorso-ventrally, dorsal soft rays 19–23.

#### Description

For morphometric data consult Table 1, and for analysis of fin formulae see Table 2. Dorsal fin XVIII–XX, 19–23; total elements 38–42, anal fin III 9–11; pectoral 1 + 7–8 + 5–4; lateral line scales 78–85 + 3–5; lateral transverse series from spinuous dorsal origin 13–16/30–36, from soft dorsal origin  $\frac{10-12}{17}$ ; gill-rakers 4–6 + 13–16; vertebrae 13 + 21 (all other South African cheilodactylids have 14 + 21).

Body compressed, ovate; dorsal profile moderately arched; nape becoming slightly concave with growth. Mouth small, maxilla just reaching below anterior margin of eye. Posterior nostril with low rim, generally with cirri, but occasionally plain (left nostril of holotype has no cirri). Front nostril tubular with two fringed tentacle-like flaps (about 10–12 cirri on posterior (longer) flap and 5–8 on anterior). Five pores each side of chin, a prominent pore each side half way between front nostril and snout tip. Gill-rakers 4 + 14 (2), 5 + 13 (1), 5 + 14 (2), 5 + 15 (13), 5 + 16 (1), 6 + 15 (3) (numbers in parentheses indicate number of gill-arches examined).

Dorsal fin origin above point half way between preopercle edge and posterior tip of opercle. Dorsal spines increase in length from first to sixth and decrease slightly from 13th to last four; second, or first and second, dorsal rays longest, decreasing gradually to last, distal edge of fin almost straight.



Anal fin origin below about 5th last dorsal spine. Second anal fin spine strongest, third spine slender, subequal to second or slightly longer, firmly attached to first soft ray which is simple. Second anal fin ray longest, about 2.5—2.7 times length of last. Edge of fin slightly concave. All rays except first divided. Pectoral fin  $1 + 7 - 8 + 5 - 4$ . The second elongate ray is usually the longest. If however only four are simple and thickened, then the ray just dorsal to the longest, that would normally be thickened and simple, is actually slender, divided and resembles those dorsal to it. This can occur on one side while on the other the pectoral is normal with five thickened rays. In 16 specimens the pectoral formula is  $1 + 8 + 5$  on both sides, in RUSI 8399 it is  $1 + 7 + 5$  on the left and  $1 + 8 + 4$  on the right, in RUSI 970, the 97 mm SL specimen has  $1 + 7 + 5$  on the one and  $1 + 8 + 6$  on the other, the extra elongate ray being the lowermost. A 120 mm SL specimen has  $1 + 9 + 4$  on both sides while one of 122 mm has  $1 + 9 + 4$  on one and  $1 + 8 + 5$  on the other.

Scales cycloid with numerous skinny flaps along posterior margin giving body a "rough" look generally associated with ctenoid scales; cheek scales much smaller than body scales, about 15—17 across cheek, 10 larger and 8 small across opercle. Snout scaly, except for small naked area round nostrils and between eye and hind nostril; about 11 scales on maxilla. Scaly sheath below spinous dorsal consists of about 7 horizontal rows. A scale row runs up each alternate spine (as the spines are heteracanth) reaching almost to the tip of the spine anteriorly, and not quite to edge of membrane posteriorly. Basal scaling below soft fin oblique, a row of scales runs up between each soft ray to leave only about 3 rows at base of posterior end of fin.

### Colour

Body buff yellow, light below with light vermillion mottlings on scales between bars in larger specimens, but almost uniform in juveniles. Six dark sepia brown bars on nape and body run obliquely backwards, do not reach the ventral surface and are sometimes distorted, slightly ventrally, near the lateral line. First bar on nape sometimes has vertical anterior margin and oblique posterior margin to run over opercle to base of pectoral fin, sometimes continued as dark spots or blotches on pectoral peduncle. Second bar from 3—5 dorsal spines goes down behind pectoral fin towards posterior half of pelvic fin; third bar from 9—11 dorsal spines towards anus, fourth bar from base of last two dorsal spines towards posterior part of anal fin; fifth bar from basal scaling of last nine rays, reaches just short of ventral edge of caudal peduncle, narrow below lateral line, posterior margin almost vertical; last (sixth) bar across caudal peduncle just in front of caudal fin, generally interrupted, dark dorsally, then much fainter. Head light below with dark streaks up branchiostegal membranes. From symphysis of upper jaw a dark area fans out to include nostrils and

interorbital. The interorbital has dark brown streaks, mostly one down midline and two each side. Eye light golden with dark area dorsally. Lips yellowish. Whole opercle darkish, preopercle and interopercle light ventral colour. Spinous dorsal just above scaling coloured like body: bluish to dusky distally, with the body bars extending into fin; behind each spine is a silver thread above the dusky margin. Dorsal fin from 1st to 5th spine dark, with red blotches on dusky membranes. The third body bar extends up and bends anteriorly to include the tip of the 8th dorsal spine. The fourth body bar's extension is dark, almost black, up to the tip of the 5th last spine. Between and subparallel to these two bars is often a light brownish bar up the fin to the dusky margin. Soft dorsal buff, with delicate vermillion mottlings along centre of fin. The fifth body bar on the basal scaling extends slightly onto the rays, sometimes only up the fin membrane. About halfway between bars four and five is often in adults a dark blotch on the basal scaling. Caudal and anal rays light vermillion with transparent membrane and dusky distal edges. Anal and pelvic spines pinkish, remainder of pelvic faint yellowish pink. Pectoral membrane colourless, upper rays pink, lower, enlarged, vermillion.

### Preserved in propanol

Brown markings as in live fish, with ground colour between bars uniform buff or with faint dusky speckling in adult. Ventral area whitish. Colour on fin rays fades completely to whitish, fin margins remain dusky.

### Comparisons

*Cheilodactylus pixi* is so closely related to the other South African species *C. fasciatus* that they are obviously derived from a common ancestor. While they have the same number of bars on the body ventrally, the bars of *fasciatus* are staggered, giving an extra bar above the lateral line, and in *pixi* they are continuous. Although the two species are sympatric, *fasciatus* is a more shallow water form with numerous specimens occurring intertidally, while *pixi* is reported to be plentiful at 20—50 m in Algoa Bay by P. C. Heemstra and M. N. Bruton diving near Cape Recife, and M. Smale diving off St Croix Island. These two species, *fasciatus* and *pixi*, differ from all other cheilodactylid species in the small scales, 75—85 in the lateral line, only 4—5 simple elongate pectoral rays (the others have 6—7) and no gas bladder. The nearest species in scale size is *C. nigripes* Richardson, 1850 from Australia with up to 70 lateral line scales (Allen & Heemstra). The shape of the spinous dorsal fin is so different from the type species, *fasciatus*, that it had been placed in another genus before Allen and Heemstra synonymised it with *Cheilodactylus*. In colour, although it possesses fewer bars, *fasciatus* resembles *rubrolabiatus* Allen and Heemstra, 1976 but *pixi* with its 6 continuous bars and uniform caudal is some-



what similar to the E. Australian and Tasmanian *spectabilis* Hutton, 1872 except that the latter has among other differences, vertical not oblique bars, more dorsal soft rays (26—27) and many fewer lateral line scales (48—54) than either of the South African forms.

### Discussion

Ripe males and females were found in the type series. It would appear that this is a small species maturing at about 100 mm SL.

### Distribution

Reported from 0 to 90 m, and captured and/or seen by sublittoral collectors from off Coffee Bay (Transkei) to Knysna. It is expected that this range will be extended by more sublittoral collecting. Unfortunately due to its small size and rock haunting habits, this species is apparently not normally taken by either line fishermen or bottom trawlers.

### Etymology

The specific name *pixi* is a contraction of the name Pixie in honour of Mr Pixie John, formerly of Port Alfred, who sent me the first specimen and always evinced a lively interest in fish and their habits.

*Cheilodactylus fasciatus* Lacépède, 1803

Plate 1C

Redfingers; rooivingers

*Cheilodactylus fasciatus* Lacépède 1803 : 6 pl.1 (no locality stated) Smith & Smith 1966 : 86 col.fig. (Tsitsikama Coast) M. M. Smith 1975 : 33 (common names).

*Chilodactylus fasciatus* Günther 1860 : 81 (Cape of Good Hope) Thompson 1918 : 79 (references); Fowler 1925 : 249; Barnard 1927 : 455 Smith 1949 : 182 Pl. 15 no. 397 (Port Nolloth to Durban). Penrith M. J. 1976 : 152 (to Rocky Point on West coast)

*Chilodactylus multiradiatus* Castelnau 1861 : 12 (Cape Colony).

### Material examined for morphometric measurements:

RUSI 8354, 216 mm Swakopmund; RUSI 8351, 113 mm; RUSI 8352, 124 mm; RUSI 8353, 57 mm all collected using piscicide west of Schoenmakers Kop near Port Elizabeth; RUSI 8355, 130 mm Buffels Bay near Cape of Good Hope; RUSI 1393, 143 mm Algoa Bay, RUSI 8599, 210 mm off Roman Rock (Algoa Bay) in 20 m.

### Diagnosis

Caudal with oblique dark markings, anterior cross-bars on body staggered below lateral line to give a chequered effect; dorsal soft rays 23—25.

### Description

For morphometric data consult Table 1 and for analysis of fin formulae see Table 2. Dorsal fin XVII—XIX, 23—25, total elements 40—44; anal fin III, 9—11; pectoral fin 1—2+7—9+5—4 total =

14, lateral line scales about 80. Gill-rakers 5—6+13—15=19—21 (Smith 1949 gives 12—13 on lower part of anterior arch but possibly did not count the raker in the angle.) Vertebrae 14+21.

Body compressed, belly and isthmus rounded in adults, dorsal profile gently convex from snout to dorsal fin origin, body more slender than *C. pixi*, depth 3.2—3.7 (*pixi* 2.6—3.1) in SL.

### Colour

(See also Smith & Smith 1966 : 86). Body and upper head pale orange with dark brown cross bars staggered anteriorly to give a chequered effect. In adults these bars, numbering 7 from nape to caudal peduncle, become more broken up especially anteriorly, and the paler areas between have numerous lines and blotches of a slightly lighter brown. The upper bars end on the dorsal fin which is greenish with brown blotches and dots. The caudal fin is more yellowish with about 10—12 oblique sepia brown streaks. The anal fin is light bronze with the distal half dark brown. Pelvic fin red with green margin. Upper pectoral fin slight greenish-transparent with 5 brown crossbars including the one outlining the base of the fin. Enlarged rays and incised membranes red. Cheek and area including branchiostegals flesh-pink; spots on cheek reddish; lips, preopercle and half of opercle dusky with dark brown spots and blotches.

### Distribution

*Cheilodactylus fasciatus* occurs from Möwe Bay\* (19° 14'S) on the west coast to Natal on the east coast, and is common along the Cape Province south coast in tide pools and sublittorally in 2 to 4 m.

*Chirodactylus* Gill 1862

*Chirodactylus* Gill, 1862 : 119 (Type-species *Cheilodactylus antonii* Valenciennes, 1833 (= *variegatus* Valenciennes, 1833) by original designation.)

*Palunolepis* Barnard, 1927 : 456 (Type-species *Cheilodactylus grandis* Günther, 1860 by original designation).

This genus is here considered valid, the South African species differ from *Cheilodactylus* as given in the key to genera. In addition the centre of the scales in this genus appear to be sand blasted and the species all possess a gas bladder, whereas in both South African species of *Cheilodactylus* the gas bladder is absent.

Through the kind offices of Dr P. A. Hulley and Mr S. X. Kannemeyer I was able to examine specimens of *Acantholatris monodactylus* and *A. vema* from the Vema Seamount. These specimens do not belong to the genus *Chirodactylus* as here defined. While the predorsal bones are similar

\*M. J. Penrith, *pers comm.*



in the two genera viz 0+0/2+1/1+1/1/1/. . . the differences may be set out as follows:

#### *Acantholatris*

1. No naked groove at base of soft dorsal fin
2. Gas bladder present
3. Scale surface smooth
4. First enlarged pectoral ray is the longest
5. Only one pectoral ray is longer than remainder of fin giving impression of a single finger (hence specific name *monodactylus*)

#### *Chirodactylus*

1. A distinct naked groove between dorsal scaly sheath and body scales
2. No gas bladder
3. Scale surface pitted as though sand blasted
4. Second enlarged pectoral ray is the longest
5. At least two pectoral rays are longer than rest of fin

Although Allen and Heemstra in their revision of the Australian species of this family place *Acantholatris* in the synonymy of *Cheilodactylus*, these two species are so different from *fasciatus* the type species of *Cheilodactylus*, that it is possible a world revision of this family may validate both *Acantholatris* and *Chirodactylus* (as is done here).

### KEY TO THE SOUTH AFRICAN SPECIES OF *CHIRODACTYLUS*

- 1a Dorsal soft rays 22—24; soft dorsal fin base subequal to spinous dorsal base; (occurs below 20 m) . . . . . *grandis* Günther, 1860
- 1b Dorsal soft rays 26—31; soft dorsal fin base longer than spinous dorsal base; (occurs intertidally and/or sublittorally to 20 m) . . . . . 2
- 2a Whole fish uniform (scarlet in life) with shining black (dark red in life) postcleithrum, conspicuous even in preserved and juvenile specimens; naked groove starts below 10th to 13th dorsal spine; dorsal soft rays 26—27; anal soft rays 7—8, last anal soft ray 1.9—2.2 in second (longest) anal soft ray . . . . . *jessicalenorum* n.sp.
- 2b Head and anterior part of body bicolored; dark dorsally, whitish ventrally, conspicuous dividing line passes below eye; edge round opercle tip dark; pectoral axil blotch not conspicuous; naked groove starts below 2nd or 3rd dorsal spine; dorsal soft rays 29—31 (rarely 28); anal soft rays 8—10 (generally 9), last anal soft ray 2.5—3.6 in second (longest) anal soft ray . . . . . *brachydactylus* Cuvier, 1830

*Chirodactylus grandis* (Günther, 1860)

Plate 2C

Bank steenbras; banksteenbras

*Chilodactylus grandis* Günther, 1860 : 79 ("Cape Seas"); Gill, 1862 : 119 (possible inclusion in *Chirodactylus*); Thompson, 1918 : 80 (references).

*Palunolepis grandis*: Barnard, 1927 : 457 Pl 20 fig 1 (False Bay and Agulhas Bank down to 40 fms); Smith, 1949 : 183 Plate 15 fig 399 (Walvis Bay to

Natal in 20—80 fms); Smith & Smith, 1966 : 77 col. fig (Tsitsikama Coast).

*Chirodactylus grandis*: Smith, 1975 : 33 (Common names only)

#### Material examined

RUSI 8354, 345 mm, False Bay; RUSI 8345, 677 mm, off Kromme River; RUSI 8346, 610 mm, RUSI 8347, 705 mm, RUSI 8348, 590 mm RUSI 8356, 195 mm, all off Algoa Bay.

#### Diagnosis

Groove at base of dorsal fin starts below the 2nd or 3rd spine; colour uniform, head and body not bi-colored; dorsal soft rays 21—23; 2nd elongate pectoral ray in adult does not reach above anal fin.

#### Description

For morphometric data see Table 1, and for analysis of fin formulae see Table 2. Dorsal fin XVII—XVIII, 22—24 (Smith 1949 gives 21—23), total elements 39—41; anal fin III, 8 (9 given by Günther, Barnard & Smith); Günther could have counted the last (double) ray as 2. Pectoral fin 2+6+6, the upper two being simple, the central 6, forming the almost truncate upper fin, are divided, and the lower 6 simple, thickened and elongated — the second being the longest, reaching to, or just short of, above the vent. Teeth similar to *jessicalenorum*. Lateral line scales 47—50+3—5; lateral transverse series from spinous dorsal origin  $\frac{6-7}{14}$ , from soft dorsal origin  $\frac{4-5}{10-11}$ ; gill-rakers 6—7+14; vertebrae 14+21.

Body compressed with rounded chest and belly; dorsal profile rising rapidly to greatest depth at pelvic fins then decreasing more rapidly to caudal peduncle than *C. jessicalenorum* and *C. brachydactylus*. Maxilla reaches to below nostrils, not quite to margin of orbit; anterior nostril with two fringed flaps, posterior nostril with rim. Dorsal fin originates over head, behind the preopercle margin. Spines increase to 5th or 6th and decrease from 9th to last. The second, longest, dorsal ray is 1.6 to 2.6 times longer than the last spine, the rays decreasing gradually in length to give straight distal edge to fin. Anal fin originates below about 6th to 7th dorsal soft rays, fin much like that of *jessicalenorum*; anterior rays about twice to nearly three times longer than last ray giving the distal margin of the fin quite a deep concavity.

Scales are moderately large with rough centres and smooth margins, those on cheek and opercle small. Dorsal scaly sheath composed of a single row of scales anteriorly and two rows posteriorly; the naked groove starting below the second or third dorsal spine and ending on the last few rays. Anal sheath consists of a single row of scales without naked groove. Caudal fin in large adults crescent-shaped, almost lunate.



## Colour

More or less uniform light reddish brown, light pinky-buff ventrally with naked groove below dorsal sheath, and outlines of most body scales dark red-brown. Lips pinkish, iris reddish with dark blotch dorsally. A red streak from anterior margin of orbit towards symphysis of upper jaw. Spinous dorsal brown, soft dorsal, caudal, anal, pelvic and upper pectoral and bases of elongate pectoral rays dark blue — distal halves of elongate pectoral rays (and 3/4 of longest ray) reddish. In preservative the fish is a uniform brown with naked groove below dorsal sheath and edges of all body scales except those on the belly dark brown.

## Distribution

Known from Walvis Bay on the west coast to Natal on the east coast in 20–150 m. (Some Natal records are *jessicalenorum*.)

*Chirodactylus jessicalenorum* n.sp.

Plate 2B, B'

Natal fingerfin; Natalse vingervin

*Chirodactylus* sp. Smith, 1975 : 33 (Common names)

## Material examined

### Holotype

RUSI 698, 260 mm (TL 325 mm) collected with spear by L. Jones August 1968 off Durban in about 10 m.

### Paratypes

RUSI 699, 307 mm (TL = 390 mm); RUSI 700, 370 mm (TL = 470 mm); RUSI 701, 385 mm (TL = 490 mm); BMNH 1980.3.26.1, 350 mm (TL = 455 mm); BPBM 22578, 390 mm (TL = 495 mm); MNHN 1980–1096, 140 mm (TL = 455 mm); SAM 2862, 385 mm (TL = 495 mm); USNM 221145, 350 mm (TL = 182 mm).

### Non-type

RUSI 8403, 320 mm (TL = 430 mm) filleted specimen i.e. head, backbone and unpaired fins) speared by Len Jones off Durban in 7–10 m.

## Diagnosis

Uniform scarlet; large, jet black (dark red in life) shiny scaleless postcleithrum from tip of opercle down to and behind pectoral fin. Dorsal-fin soft rays 26–27, total dorsal elements 43–44; A III, 7–8.

## Description

For morphometric data see Table 1 and for analysis of fin formulae Table 2. Dorsal fin XVII–XVIII, 26–27, total elements 43–44, anal fin III, 7–8, pectoral fin 2 + 6 + 6; lateral line scales 46–54; lateral transverse series from dorsal fin origin 5–6/14–15, from origin of soft dorsal to anal 5/10; gill-rakers 6–7 + 14–16; vertebrae 14 + 21.

Body compressed, ovate, belly and chest rounded in adults. Dorsal profile with snout gently rounded then almost straight from above anterior nostril across interorbital and nape to dorsal fin origin.

Body less deep than *grandis* and tapers more gradually posteriorly to caudal peduncle. Maxilla reaches below anterior margin of orbit. Lips thick, plicate, with villi (resembling blotting paper); upper lip thicker than lower. Teeth moveable, villiform, about five series anteriorly in upper jaw, reduced to one series on each side. Lower jaw with band of about four series anteriorly reducing to single series at side.

Nostrils generally with slight rim, small anterior flaps and larger posterior flaps, although anterior nostrils in RUSI 699 have neither rims nor flaps, and are pointed anteriorly. Anterior nostril in holotype with large fringed posterior flap. Posterior nostril always larger, diameter 1.4–2.2 times diameter of anterior nostril on same side.

Dorsal fin originates almost above preopercle edge, spines increase in length to fifth and decrease from eighth or ninth to last. First and/or second dorsal rays longest, decreasing gradually to last to give straight distal margin to fin. Base of spinous dorsal equal to, or greater than, head but less than soft dorsal base.

Anal origin below about eighth dorsal soft ray. Last anal ray about half the length of the two first rays, the distal margin of the fin being concave. The anal base is short, being contained three or more times in base of soft dorsal.

Pectoral with first two dorsal rays simple, next six branched, forming upper, almost truncated, fin, and lowest six rays thickened, simple and elongate; the second being the longest, reaching beyond the anal fin origin, and nearly twice the length of the upper fin.

Scales cycloid, exposed portions granulated with wide, very delicate smooth skin-like edge posteriorly. Scaling on head extends almost to level of front nostril, and on cheek forward to level of maxilla. Remainder of head except rim round orbit, scaly. About 14–15 series of scales across cheek, and 12 series across opercle. Preopercle edge and opercular flap naked. Pectoral fin densely covered with small scales basally. Caudal fin with numerous minute scales on membrane between rays extending about 3/4 distance to end of fin. Dorsal fin with basal sheath; naked groove starts below 10th–13th spine, above which the sheath is mostly a single scale in width to the base of the penultimate spine where it increases to a double row of scales to 2nd soft ray, thereafter 2 1/2 scales in width until it gradually peters out to a few fine scattered irregular scales above the naked groove at the base of the 7th to 5th posterior rays. The naked groove then fans out leaving the last four rays without a basal sheath.

## Colour

(In life) uniform scarlet, scales with darker edges, head lighter ventrally, the whole of the postcleithrum is scaleless and conspicuous shiny red black, stretching from tip of opercle to axis and behind pectoral fin base (see Plate 2B and B').

Juveniles of about 70 mm SL are pink to reddish



anteriorly and dorsally; the caudal, whole caudal peduncle then obliquely down to belly, including the anal fin, yellow. Belly, chest, pectoral and ventral fin rays silvery.

Preserved specimens are buff colour with darker edges to scales, the black area round the pectoral remains conspicuous even after long preservation in propanol. The most anterior gill-raker is in a black spot, and the membrane between the 3rd, 4th and 5th branchiostegals is dark.

### Comparisons

Although uniform in colour like *grandis*, *jessicalenorum* is easily recognisable in life by its bright scarlet or pinky red colour as opposed to the more somber browns and red browns of *grandis*. The dark pectoral axillary mark is also much larger and conspicuous in *jessicalenorum*, and the longest pectoral ray in adults is 1.6 to 1.9 times the length of the divided ray portion. In *grandis* this free portion is much shorter, less than the length of the upper part of the fin. The 26–27 dorsal rays in *jessicalenorum* makes the base of the soft dorsal much greater than that of the spinous dorsal, whereas with only 22–23 dorsal rays in *grandis*, the two bases are about equal. Meristically, *jessicalenorum* is closer to *brachydactylus*. There are however 26–27 dorsal and 7–8 anal rays in *jessicalenorum* as opposed to 28–31 dorsal and 8–10 anal rays in *brachydactylus*. In *brachydactylus*, as in *grandis* the free portion of the longest pectoral ray is less than the length of the divided ray portion while in adult *jessicalenorum* it is greater.

While the South African species, *grandis*, *jessicalenorum* and *brachydactylus* are congeneric with the type species *variegatus* from South America, they all differ from it in the length of the enlarged ventral rays in the pectoral fin. These rays in *variegatus* are only slightly longer than the upper divided rays, the second elongate pectoral ray being well short of the anus. In the South African species however it reaches nearly to the anus, or even beyond the anal fin origin. The scales in the South African species are larger, 46–50 in lateral line while *variegatus* has 54–60. *C. jessicalenorum* has 2 or 3 rays less in the dorsal and anal fins than *variegatus* which has much the same dorsal fin formulae as *brachydactylus*. The markings in *variegatus* are broad light vertical crossbars on a dark brown body, *jessicalenorum* and *grandis* are unicolored while *brachydactylus* is longitudinally bicolored.

*Chirodactylus jessicalenorum* is most closely related to the two South African species, *grandis* and *brachydactylus* (see above). The Australian *fuscus* described by Castelnau in 1879, is also uniform, but it is brown, more like *grandis*. Significant differences are that it has four prominent bony knobs in front of eyes and on snout (unknown in South African species) and 60–64 lateral line scales while *jessicalenorum*, *grandis* and *brachydactylus* have 46–55.

### Discussion

Spearfishing records for “*Palunolepis grandis*” from Natal waters caught my attention. *Chirodactylus grandis* is known from water below 60 m off the Algoa Bay area although skindivers reported (and sent me a specimen for verification) that they occur from about 20 m in the cooler waters of False Bay. If this species were to be found in the warmer waters off Natal, it would likely be at even greater, not shallower, depths than off Port Elizabeth. Asked to collect specimens, Jessica and Len Jones, managed at different times to spear and send me the eight type specimens and the one filleted non-type specimen. They state that specimens from 0.5 to 3.5 kg occur quite commonly in rocky areas 7–20 m deep. I also received a photograph of a specimen of nearly 3 kg speared by D. G. Crews in January 1969 close to the shore in about 10 m on a rock ledge in Coffee Bay, Transkei. He reported that this species (easily identified as *jessicalenorum*) is not uncommon there.

### Distribution

*Chirodactylus jessicalenorum* is plentiful off Natal and is known from KwaZulu to Coffee Bay, Transkei, but has not yet been found in Cape Province (i.e. south of the Kei River). Its vertical distribution is reported to be from about 3 to 20 m.

### Etymology

Named for Jessica and Len Jones, who not only procured the specimens for me, but for many years, as records officers of the South African Underwater Union, have skillfully identified fish caught by spearfishermen.

*Chirodactylus brachydactylus* (Cuvier, 1830)

Plate 2A

Twotone fingerfin; steenklipvis

*Cheilodactylus brachydactylus* Cuvier, 1830 : 361 (Cape of Good Hope).

*Chilodactylus brachydactylus*: Günther, 1860 : 81 (Cape of Good Hope); Thompson, 1918 : 79 (references); Norman 1922: 321 (Natal).

*Palunolepis brachydactylus*: Barnard, 1927 : 458 (Table Bay to Natal); Smith, 1949 : 182, pl 15 no 398 (3 growth stadia) (Walvis Bay to Delagoa Bay); Smith & Smith, 1966 : 87 col. fig adult and juvenile (Tsitsikama Coast).

*Chirodactylus brachydactylus*: Smith, 1975 : 33 (common names).

*Chilodactylus brevispinis* Regan, 1921 : 416 (in 220–240 m off the Umvoti River, Natal).

### Material examined

(As this common species differs from *grandis* and *jessicalenorum* mainly in the number of dorsal-fin rays, counts of these were made on 32 specimens.) For the morphometric measurements the following specimens were used:

RUSI 8596, 185 mm Nature's Valley (west of Tsitsi-



kama coast); RUSI 2629, 146 mm Storms River, Tsitsikama coast; RUSI 74—71, 146 & 173 mm, RUSI 8600, 185 mm 202 mm, RUSI 8597, 140 mm (illustrated in Smith & Smith 1966) all from Schoenmakers Kop wreck; RUSI 2746, 230 mm Algoa Bay; RUSI 8595, 162.5 mm Bushmans River Mouth; RUSI 8601, 195 mm Port Alfred; RUSI 2747, 258 mm off Durban (speared); RUSI 8602, 145.4 mm off Durban (speared).

### Diagnosis

Dorsal soft rays 28—31, head and body bicolored: dark dorsally, light ventrally, with dividing line from symphysis of upper jaw, below eye along middle of body above pectoral fin variably to caudal peduncle; five or six silvery spots on scale row just below lateral line. Naked groove between dorsal scaly sheath and body scales starts below 2nd or 3rd dorsal spine.

### Description

Morphometric data are in table 1 and analysis of fin formulae in table 2. Dorsal fin XVII—XVIII, 28—31, total elements 45—49; anal fin III, 8—10; pectoral fin 2+6+6; lateral line scales 46—50+3—5; lateral transverse series from spinous dorsal origin 6/14—16, gill-rakers 6+14—15; vertebrae 14+21.

Body ovate, compressed with belly and breast rounded, mouth when closed almost subinferior, snout steep, bending opposite nostrils, from where profile to origin of dorsal almost straight. Body does not taper as rapidly to caudal peduncle as other two species so that depth at anal origin not very different from that at dorsal origin. Maxilla reaches to below posterior nostril, almost to below anterior margin of orbit. Anterior nostril with two fringed flaps, posterior with low rim. Dorsal fin starts slightly in advance of the dorsal origin of the opercular flap; spines increase gradually to 8th and decrease slightly from 13th to last; 2nd dorsal fin ray longest, only about a third longer than last spine; margin of fin slightly rounded. Anal fin origin under about the 3rd dorsal soft ray; the second (longest) ray 2.5 to 3.5 times the last; margin of fin almost straight or with anterior rays making a slight bulge. Second enlarged ray of pectoral reaches to above vent or anal spines, free portion 28 to 37% of ray (in *jessicalenorum* the free portion of the 2nd enlarged ray is 43 to 50% of the ray).

Scales are similar to those of *grandis*; naked groove at base of dorsal scaly sheath commences below 2nd or 3rd dorsal spine.

**Colour** in life: (See also Smith & Smith 1966 : 87)

Upper half of head and most of body bronzy brown. The division between the dark dorsal areas of the head and anterior body, and the light ventral areas is brightly marked by a silver band from the front of the snout (at the symphysis) up to and running under the eye. It then bends towards the origin of the lateral line and runs below the first few lateral line scales to end in a silver spot. This is

followed by five equidistant silver spots on about every sixth scale on the row below the lateral line, the last occurs behind the posterior end of the anal fin but before the end of the dorsal fin. Above the pectoral fin to three scales below the lateral line the body is silver, once again dividing the dark dorsum from the light golden brown ventral colour. There is a thin wavy silver streak from dorsal opening of opercle towards the upper rim of the orbit. The opercle flap is black, as is the pectoral axil. Body behind the upper half of pectoral fin can be bicolored or uniform brown (like the nape and anterior dorsum). The chin and lower margin of the opercular flap are silver with area round the pinkish lips dark brown. Cheeks and opercle between these silver bands brownish. Iris vermilion with darker areas and light gold rim round pupil. Spinous dorsal brownish green, soft dorsal golden brown with dark margin, caudal golden brownish with lower tip vermilion, pelvics and anal dull vermilion and pectorals bright vermilion. Scales of dark parts of body outlined darker brown.

Preserved specimens retain the bicolored appearance, but lose all the vermilion, becoming dark brown above, lighter below with the dividing line below the eye remaining obvious.

### Distribution

Known from Walvis Bay on the west coast to Delagoa Bay on the east. Plentiful in rockpools and have been caught in 240 m off Natal.

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TABLE 1

Morphometric data for all South African species. Figures are ratios;

(j) = smallest specimen measured

	<i>pixi</i>	<i>fasciatus</i>	<i>grandis</i>	<i>jessicalenorum</i>	<i>brachydactylus</i>
n : SL in mm	21: 45–132.5	7: 58–216	6: 195–705	9: 140–400	12: 145–258
<u>SL</u> Head	3.0–3.5	2.7–3.5	2.9–3.2	2.5(j)–3.5	2.9–3.3
<u>SL</u> depth at D origin	2.6–3.3	3.2–3.7	2.7–2.9	2.6–2.8	2.6–3.0
<u>SL</u> depth at A origin	3.0–3.5	3.3–3.9	3.0–4.3	3.1(j)–3.8	2.9–3.5
<u>depth at D origin</u> depth at A origin	1.0–1.2	1.0–1.1	1.1(j)–1.5	1.1–1.4	1.1–1.2
<u>head</u> snout	3.0–4.3	2.8–3.3(j4.1)	2.2–2.6	2.2–2.4	2.2–2.5
<u>head</u> eye	3.4(j)–4.5	(3.6j)4.0–4.4	4.5–6.6	4.0(j)–5.8	4.0–4.8
<u>postorbital</u> eye	1.5(j)–2.2	(1.4j)1.9–2.6	2.1–3.0	1.8–2.6	1.6–2.2
<u>interorbital</u> eye	0.7–1.1	0.7(j)–1.0	1.0–1.8	0.9(j)–1.3	0.8–1.2
<u>preorbital</u> eye	0.3(j)–0.6	(0.3j)0.5–0.6	1.0–1.5	.95(j)–1.4	0.8–1.0
<u>head</u> interorbital	3.7(j)–4.9	5.3–5.8	3.5–4.5	4.0–4.4	3.8–4.7
<u>head</u> preorbital	6.6–11.8	7.4–9.3(10.3j)	4.1–4.6	3.8–4.3	4.6–5.7
<u>upper jaw</u> eye	0.7–1.2	(0.8j)1.0–1.2	1.1–1.9	1.0–1.4	0.9–1.3
<u>head</u> upper jaw	3.7–5.2	3.7–4.3(4.4)	3.2–4.1	3.5–4.3	3.5–4.7
<u>SL</u> base sp. D	2.1–2.5(j)	2.2–2.8	2.7–2.9	2.7(j)–3.1	2.8–3.4
<u>SL</u> base soft D	3.8–4.6	3.6–4.3	2.7–3.0	2.3–2.9	2.5–2.9
<u>base sp. D</u> base soft D	1.6–2.1	1.4–1.8	1.0–1.0	0.9–1.0	0.8–0.9
<u>base sp. D</u> head	1.2–1.5	1.0–1.4	1.1	1.0–1.3	1.0–1.3
<u>base soft D</u> head	0.7–0.9	0.8–1.0	1.0–1.1	1.1–1.5	1.1–1.3
<u>base sp. D</u> base A	2.5–3.2	2.4–3.3	2.8–3.6	2.7–2.9	2.2–2.8
<u>base soft D</u> base A	1.5–1.8	1.5–2.1	2.8–3.4	3.0–3.3	2.6–3.3
<u>head</u> depth C. peduncle	3.0(j)–3.8	3.5–3.6(4.2j)	3.8–4.5	2.9(j)–3.9	3.3–3.7
<u>head</u> length pelvic	1.5(j)–2.0	1.6–1.9	1.8–2.3	1.4(j)–1.6	1.7–2.1
<u>head</u> longest D spine	2.4–2.9	3.0–3.4	3.2–4.4	2.7(j)–3.4	3.4–5.0
<u>head</u> last D spine	3.0–4.2	3.6–7.4	4.8–11.4	3.2(j)–5.1	4.1–5.4
<u>head</u> 1st D ray	1.8–2.4	2.3–3.1	3.6–5.0	2.4(j)–4.1	3.5–4.3
<u>head</u> longest D ray	1.8–2.3	2.3–2.9	3.2–4.5	2.4(j)–3.8	3.1–3.6
<u>longest D ray</u> last D spine	1.5–1.8	1.5–2.5	1.6–2.6	1.2–1.6	1.9–2.8
<u>head</u> 2nd A spine	3.3–5.6	4.6–5.7	5.6–8.5	4.0(j)–7.0	4.4–6.6
<u>head</u> 3rd A spine	3.2–4.6	3.1–4.0	4.2–5.5	3.2(j)–4.6	2.8–4.5
<u>head</u> 1st A ray	1.8–2.3	1.6–2.3	2.0–2.3	1.8(j)–2.4	1.8–2.3



TABLE 1 (continued)

	<i>pixi</i>	<i>fasciatus</i>	<i>grandis</i>	<i>jessicalenorum</i>	<i>brachydactylus</i>
head	1.7—2.1	1.7—2.1	1.9—2.2	1.7(j)—2.3	1.7—2.0
longest A ray					
head	3.5—5.6(7.1)	4.3—5.5	5.1—7.2	3.5—4.6	4.1—7.4
last A ray					
longest A ray	2.1—2.8(3.6)	2.5—2.7	1.9—2.8	1.9—2.2	2.5—3.6
last A ray					
PECTORAL					
head	1.2—1.5	1.4—1.6	1.5—1.7	1.3—1.5	1.2—1.6
longest div. ray					
head	1.1—1.6	1.2—1.9	1.4—1.9	1.0(j)—1.7	1.1—1.5
1st enlarged ray					
head	0.9—1.0	0.9—1.0	1.0—1.2(1.6)	0.7—0.9	0.9—1.1
2nd enlarged ray					
head	1.0—1.2	1.0—1.2	1.5—1.7	0.9—1.2	1.0—1.2
3rd enlarged ray					
head	1.2—1.5	1.3—1.5	1.5—2.1	1.2—1.6	1.3—1.6(j)
4th enlarged ray					
head	1.3—1.9	1.7—2.7	1.9—2.7	1.7—2.4	1.7—2.0(j)
5th enlarged ray					
head	—	—	3.9—4.6	2.8—3.6	2.7—3.7(j)
6th enlarged ray					
2nd enlarged ray	2.5—4.0	2.0—3.5	2.6—4.9	2.0—2.3(2.8j)	2.5—3.6(j)
free portion	(excl. juvs)				
free portion %age	22(j)—39%	29—50%	20—38%	43—50%	28—37%
2nd enlarged ray					
longest enlarged ray	1.3—1.6	1.4—1.7	1.2—1.6	1.6—1.9	1.4—1.7
longest div. ray					

D = dorsal fin; A = anal fin; C = caudal fin; longest div. ray (of pectoral) = length of upper fin

TABLE 2

<b>DORSAL SPINES</b>	16	17	18	19	20	n								
<i>pixi</i>			2	18	3	23								
<i>fasciatus</i>		1	1	12		14								
<i>variegatus</i>	1	3				4								
<i>grandis</i>		7*	1+			8								
<i>jessicalenorum</i>		8	1			9								
<i>brachydactylus</i>	1(D)	6	8			15								
<b>DORSAL SOFT RAYS</b>	19	20	21	22	23	24	25	26	27	28	29	30	31	n
<i>pixi</i>	2	4	12	4	1									23
<i>fasciatus</i>					1	11	2							14
<i>variegatus</i>										1	2	—	1	4
<i>grandis</i>				4	2*	1								7
<i>jessicalenorum</i>								7	2					9
<i>brachydactylus</i>										2	12	10	9	33
<b>TOTAL DORSAL ELEMENTS</b>	38	39	40	41	42	43	44	45	46	47	48	49	n	
<i>pixi</i>	2	4	12	3	2								23	
<i>fasciatus</i>			(1)			12	1						14	
<i>variegatus</i>								1	2	1			4	
<i>grandis</i>		4	2*	1									7	
<i>jessicalenorum</i>						6	3						9	
<i>brachydactylus</i>							1(D)	1	3	13	9	6	33	
<b>ANAL SOFT RAYS</b>			7	8	9	10	11		n					
<i>pixi</i>					3	18	1		22					
<i>fasciatus</i>					1	8	5		14					
<i>variegatus</i>					2	2			4					
<i>grandis</i>				6	1*				7					
<i>jessicalenorum</i>			1	8					9					
<i>brachydactylus</i>				4	7	1			12					

\* = includes Günther's 1860 figures for holotype. He possibly counted the last double ray as 2.

+ = Barnard (1927) gives XVII—XVIII

D = deformed specimen

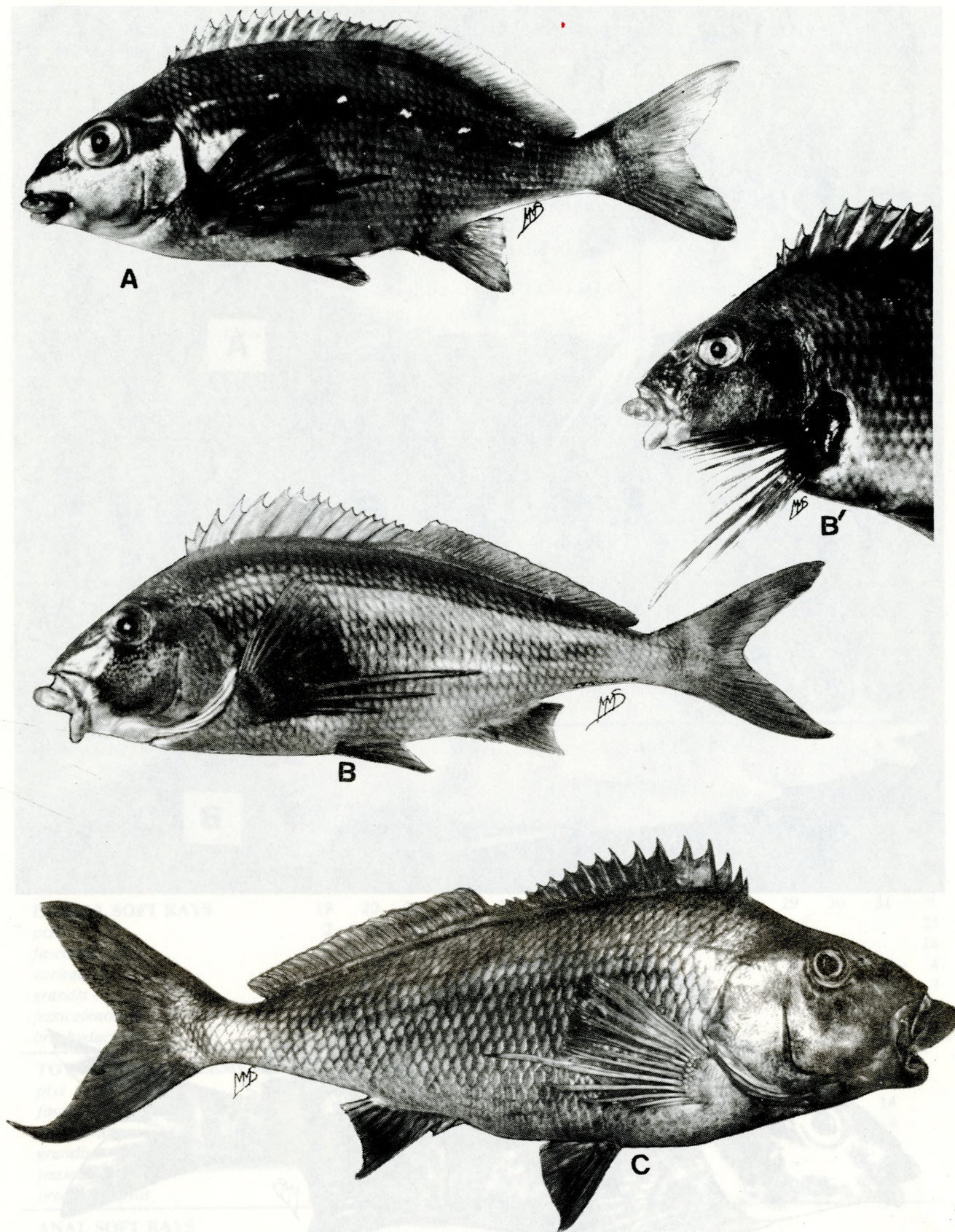




**Plate 1**

A & B *Cheilodactylus pixi* n.sp. A. Holotype TL = 160 mm RUSI 702; B. Paratype TL = 160 mm RUSI 970;  
 C. *Cheilodactylus fasciatus* TL = 155 mm RUSI 8352 from Schoenmakerskop (W. of Algoa Bay)





**Plate 2**

- A. *Chirodactylus brachydactylus* TL = 180 mm, RUSI 8597 from wreck at Schoenmakerskop (W. of Algoa Bay).  
 B, B' *Chirodactylus jessicalenorum* n.sp. TL = 320 mm. Holotype RUSI 698. B' shows pectoral fin bent forward to reveal the dark, smooth, naked postcleithrum.  
 C. *Chirodactylus grandis* TL = 850 mm from off Algoa Bay.