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*CLINUS SPATULATUS*, A NEW SPECIES OF CLINID FISH  
(PERCIFORMES: BLENNOIDEI) FROM SOUTH AFRICA, WITH  
A MODIFIED DEFINITION OF THE GENUS *CLINUS*.

by

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## ABSTRACT

Bennett, B.A. 1983. *Clinus spatulatus*, a new species of clinid fish (Perciformes: Blennioidei) from South Africa, with a modified definition of the genus *Clinus*. J.L.B. Smith Institute of Ichthyology, Special Publication No. 29, 9 pages, 6 figures.

*Clinus spatulatus* sp. n. is described from 50 specimens collected from an estuary in the southwestern Cape Province, South Africa. The presence of supraorbital tentacles or papillae distinguishes *Clinus* and *Gynutoclinus* from other South African genera of the subtribe Clinidi. The new species has simple supraorbital tentacles, an intermediate condition between the well-developed, at least bifid tentacles of *Clinus* and the simple supraorbital papillae of *Gynutoclinus*. For this reason Penrith's (1969) diagnosis of *Clinus* is modified to include the new species as well as the monospecific *Gynutoclinus* thereby incorporating all South African species with supraorbital papillae or tentacles.

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During an ecological study of fish inhabiting southwestern Cape estuaries an unusual species of clinid was discovered. This species, although clearly referable to the subtribe Clinidi Hubbs and superficially similar to many southern African clinids, was found to differ from all previously described South African species, especially with regard to the shape of its supraorbital tentacles.

Supraorbital tentacles are regarded as important morphological features in determining generic placement within the South African Clinidi. Smith (1945) divided the South African Clinidae into two subfamilies, the Clininae, containing those species possessing a "fringed" supraorbital tentacle and the Myxodinae, with no tentacle over the eye. He placed *Clinus rotundifrons* (Barnard) into the new genus *Gynutoclinus* in the non-tentacled group, but as Penrith (1965) pointed out, they do in fact have a small papilla over the eye. In the most recent revision Penrith (1969) established five genera of which *Clinus* had "at least bifid" tentacles; *Gynutoclinus* a "minute simple papilla" over the eye while the other three genera lacked tentacles.

The species to be described below is intermediate between *Clinus* and *Gynutoclinus* in the shape of its supraorbital tentacles. At one extreme the supraorbital tentacles are minute and papillose (Fig. 1A), resembling those of *Gynutoclinus*, and on the other they are elongated and bifid (Fig. 1E), a condition sometimes present in some *Clinus* species. Most of the specimens, however, had well-developed simple tentacles (Fig. 1B & C), intermediate between those of *Gynutoclinus* and *Clinus*, it is therefore suggested that all South African clinids possessing supraorbital projections be included in the diverse genus *Clinus*.

Australian and Indo-Pacific clinids are in need of revision. Of the six genera in current use only *Cristiceps* has been generally regarded as distinct. The status of *Clinus*, *Heteroclinus*, *Neoblennius*, *Petraites* and *Springeratus* is discussed by Penrith (1969), McKay (1970), Shen (1971), Fraser (1972) and Hoese (1976) and will not be considered further in this paper. Supraorbital tentacle characteristics are not important in placing species among the above genera, thus the proposed modification of the South African genus *Clinus* will not affect the taxonomy of the group as a whole.

The subdivision of *Clinus* into subgenera is discussed by Penrith (1969; 16-19). She used five subgenera, one containing a large number of generalised species and the other four representing particular lines of development. *Clinus rotundifrons*, the type-species of the genus *Gynutoclinus*, differs from other species of the subgenus by having a more compressed body and a more rounded head. These differences represent only an extension in the range of body form shown by this group and are therefore not considered sufficient to set *Gynutoclinus* apart as a separate subgenus.

Measurements and terminology used in the description follow Penrith (1969).

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## Genus *Clinus* Cuvier, 1816

- Clinus* Cuvier, 1816: 251 (type-species *Blennius acuminatus* Bloch & Schneider, 1801 by subsequent designation by Swainson, 1839: 75).
- Cirrhibarbis* Valenciennes, in Cuv. & Val., 1836: 406 (type-species *Cirrhibarbis capensis* Valenciennes, in Cuv. & Val., 1836 by monotypy).
- Blennophis* Swainson, 1839: 75 (type-species *Clinus anguillaris* Valenciennes, in Cuv. & Val., 1836 by monotypy).
- Ophthalmolophus* Gill, 1860: 104 (type-species *Clinus latipennis* Valenciennes, in Cuv. & Val., 1836 by monotypy).
- Climacoporus* Barnard, 1935: 646 (type-species *Climacoporus navalis* Barnard, 1935 by monotypy).
- Nemacoclinus* Smith, 1937: 195 (error for *Climacoporus* Barnard).
- Muraenoclinus* Smith, 1945: 538 (type-species *Clinus dorsalis* Castelnau, 1860 by monotypy).
- Blenniomimus* Smith, 1945: 538 (type-species *Clinus taurus* Gilchrist & Thompson, 1908 by original designation).
- Caboclinus* Smith, 1966: 73 (type-species *Clinus robustus* Gilchrist & Thompson, 1908 by original designation).
- Gynutoclinus* Smith, 1945: 545 (type-species *Clinus rotundifrons* Barnard, 1937 by monotypy).

NOTE: According to C. Roux (1976, *J. Soc. Bib. Hist.* 8(1): 31), volume 2 of the first edition of Cuvier's *Le Règne Animal* was published in 1816, not 1817 as is usually cited. The genus *Cirrhibarbis* was attributed to Cuvier, 1817 by Penrith (1969: 14,25), but this genus was not mentioned in the first edition of *Le Règne Animal*. It was indicated, but only in the vernacular form "Les Cirrhibarbes", in the second (1829) edition. The genus *Cirrhibarbis* must then be attributed to Valenciennes, in Cuv. & Val., 1836.

DIAGNOSIS: (Modified from Penrith 1969: 14). A papillose, simple or fringed tentacle over eye. Lateral line usually of double pores and/or single pores opening above and below line anteriorly; posterior to post-pectoral curve usually of short separate horizontal tubes with a pore at either end. Intromittent organ of male usually consists of fairly long basal portion with small tip retractile between one or two pairs of fleshy lips. Body covered with small embedded cycloid scales. Two bands of villiform teeth in each jaw, outer row larger. Vomer toothed. Upper jaw averages more than 40% head length. Vertebrae (15-21) + (27-40).

## Subgenus *Clinus* Cuvier, 1816

Synonyms: *Ophthalmolophus* Gill, 1860; *Blenniomimus* Smith, 1945; *Gynutoclinus* Smith, 1945.

DIAGNOSIS: Body not elongate. Head naked; no barbels on chin or snout. More than one dorsal soft-ray. Vertebrae (15-18) + (27-33).

## *Clinus* (*Clinus*) *spatulatus* sp. n.

(Figs. 1 + 2)

HOLOTYPE: South African Museum (SAM) No. 29449: female, 78.5 mm SL; Botrivierlei, southwestern Cape Province, South Africa (34°21'S 18°07'E); 6 April 1981; B.A. Bennett, collector.



PARATYPES: (All paratypes were collected at the same locality as the holotype from May 1980 to April 1981.) SAM 29450: male, 86.6 mm SL; SAM 29451: 10,22.5-133.6 mm SL. Australian Museum (Sydney) No. I.23903-001: 6,67-88 mm SL. Bernice P. Bishop Museum (Honolulu) No. 28955: 6,29-84 mm SL. National Museum of Victoria (Melbourne) No. A3177: 5,61-66 mm SL. JLB Smith Institute of Ichthyology (Grahamstown) No. 18239: 13,28-114 mm SL. United States National Museum (Washington, D.C.) No. 259352: 5,43-72 mm SL.

DIAGNOSIS: pectoral rays 13-15; dorsal soft-rays 6-8; pelvic rays 3; gill-rakers (2-4) + (6-8); and vertebrae (17-18) + (28-29). This species may be distinguished from all other members of the subgenus in usually having elongate, simple supraorbital tentacles.

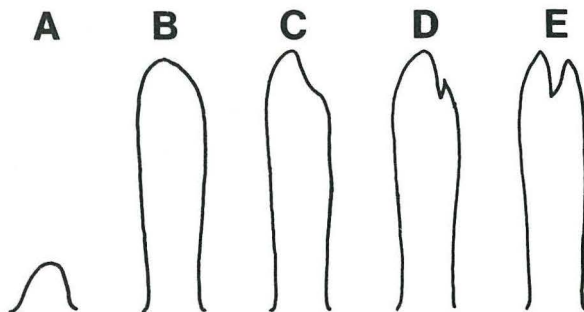


Figure 1. Range of supraorbital tentacle shapes observed in a sample of 50 *Clinus spatulatus*. Number of fish with tentacles of a particular shape or, where bilaterally asymmetrical, combination of shapes as follows: A=0, AB=2, B=30, BC=5, C=6, CD = 3, D=2, DE=2, E=0.

DESCRIPTION: Based on 50 specimens 20-150 mm SL (Fig.4). See Table 1 and Figure 3 for frequency distributions. D XXXII-XXXV, 6-8; A II, 23-25; P 13-15; V I, 2-3; C 13. Vertebrae (17-18) + (28-29). Gill-rakers in outer series on first arch (2-4) + (6-8). Dorsal fin with first 3 spines elevated to form a crest, considerably higher in mature males than in females (Fig. 3A). Notch in membrane between third and fourth dorsal spines (45-100% of fourth spine free, Fig. 3B). No clusters of cirri at tips of dorsal spines. Pectoral fin rounded. Inner pelvic ray reduced and not free from membrane.

Caudal peduncle length and depth 27-38% head length. Caudal fin subtruncate. Body slightly compressed, not elongate, covered with small embedded scales more or less overlapping on front half of body, not extending onto fin bases; head naked. Depth 3.8-5.0 in SL (juveniles < 40 mm SL more elongate Fig. 3C); head 3.5-4.4 in SL, becoming proportionately more robust with increasing length, especially in males. Eye 2.5-3.7 in head (2.5-2.8 in juveniles); Upper jaw 1.8-3.0 in head. Interorbital convex. Supraorbital tentacle small (Fig. 3D), subcylindrical basally usually with a simple spatulate tip (Fig.1). Cirrus on anterior nostril flap-like on a tubular pedicel. Sensory pores of head variable; often double in supraorbital, postorbital, occipital and upper preopercular series, single elsewhere (Fig. 2B).

Lateral line (Fig. 2C), from its origin to upper portion of post-pectoral curve of single pores opening above and below the line and some vertical pairs of pores, thereafter of separate horizontal tubes with pores at each end, becoming indistinct posteriorly. Intromittent organ of male (Fig. 2D) moderately long with thick basal portion, tip almost entirely ensheathed by confluent ventral lips with two smaller indistinct dorsal lips set further back.

Dentary with an outer row of moderate teeth, largest mid-laterally, and an inner band of small, blunt teeth anteriorly. Vomerine teeth absent. Coronoid (ascending) process of articular tilted slightly forward and tapering to a blunt point. Infraorbital bones tubular, with wide openings for sensory canals (Fig. 4a); third infraorbital with a relatively narrow suborbital shelf. Postcleithra consisting of 2 well-separated bones (Fig. 4b); dorsal postcleithrum thin and disk-shaped, ventral postcleithrum rod-shaped with pointed ends.

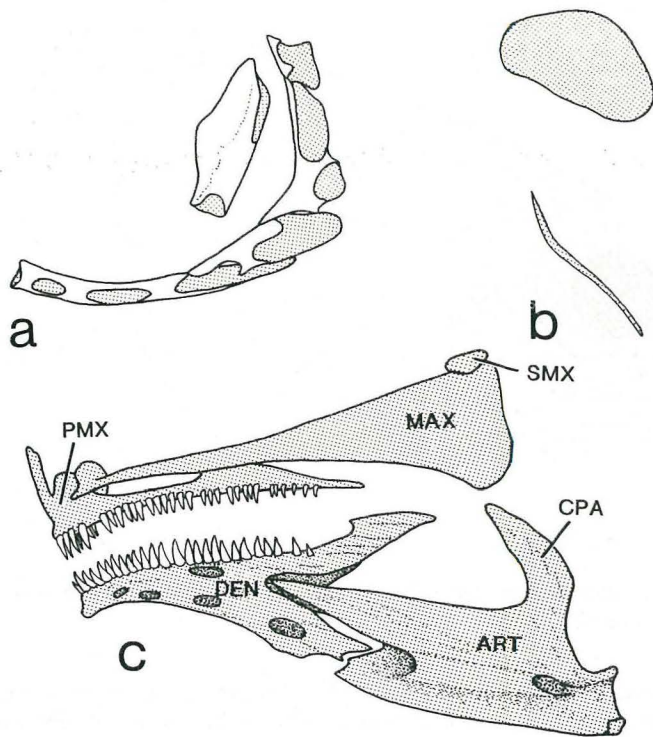


Figure 4. Lateral views of (a) infraorbital bones (3rd infraorbital also in dorsal view), (b) postcleithra, and (c) upper and lower jaws in *Opistognathus margaretae*, ANSP 149352, 50.7 mm SL. Abbreviations: premaxilla (PMX), maxilla (MAX), supramaxilla (SMX), dentary (DEN), articular (ART), coronoid process of articular (CPA).

Morphometric data are given in Table 1. The orbit diameter of the smallest (44.7 mm SL) specimen is 11.2% SL versus 9.2 to 9.7% SL in specimens 50.7 to 77.7 mm SL. This marked difference in relative size of orbit diameter is presumed to be due to allometric growth because the orbit is significantly larger in young versus adults in other species of *Opistognathus* for which good size series are available. Upper jaw length not sexually dimorphic (Fig. 5).

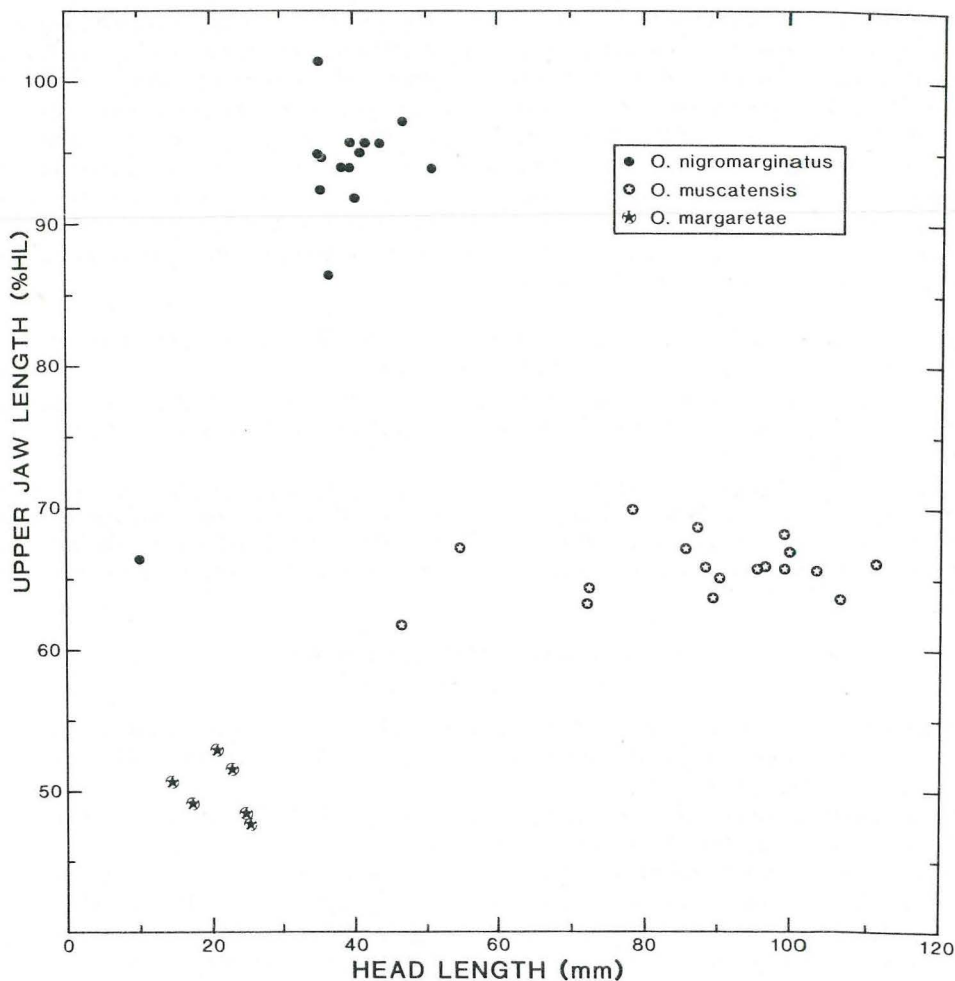


Figure 5. Relationship between head length and upper jaw length in *Opistognathus margaretae*, *O. muscatensis* and *O. nigromarginatus*.

Colour pattern in preservative: Head and body light brown, body mottled with a few pale blotches. Dorsal fin with a black ocellated spot between 3rd and 5th spines, remainder of dorsal fin brownish with scattered small, pale spots. (RUSI 7599, is aberrant in having a small, additional dark spot in the dorsal fin between the second and third spines — see Smith and Smith, 1963: pl. 8, fig. D.) Caudal fin with a pair of large, pale spots basally; pelvic and anal fins almost uniformly dark. Inner surface of maxilla and adjacent membranes pale except for a dusky blotch at corner of rictus. Area surrounding esophageal opening and upper pharyngeals pale. Life coloration unknown.



**DISTRIBUTION:** To date known only from the Botrivierlei and Kleinmond estuary (34°21'S, 18°07'E) in the south-western Cape Province, South Africa.

**REMARKS:** A single specimen (SAM 21938, female; see Penrith 1965b for description), with supraorbital tentacles very similar to those of *Clinus spatulatus* was collected from Richards Bay, Kwazulu (date and collector unknown). The specimen differs from *C. spatulatus* in having a considerably more rounded head profile and scales extending onto the caudal fin base; these features may be sufficient to justify its description as a separate species but this is considered inadvisable because only one individual is available for study.

**ETYMOLOGY:** *spatulatus* (Latin, adjective) — a reference to the shape of the supraorbital tentacle.

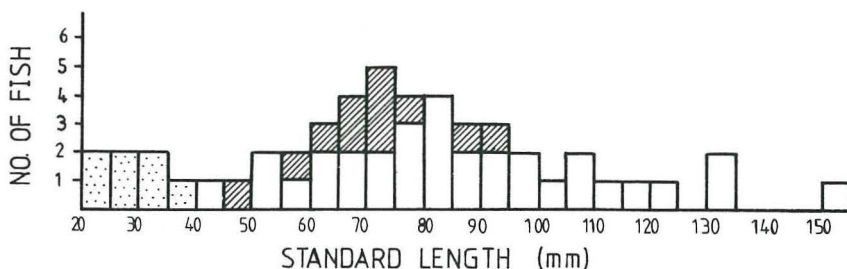


Figure 4. Size distribution of 50 *Clinus spatulatus* on which the description is based. Clear area = females, hatched = males, stippled = juveniles.

**ECOLOGY:** Monthly samples of fish were collected from three different localities in the Botrivierlei between May 1980 and April 1981. The estuary was isolated by a sand bar during the period sampled, having last been in contact with the sea at the end of 1977. Temperatures varied between 13.9°C and 24.5°C and salinities between 7‰ and 15‰ (Coetzee 1982). Salinities subsequently fell to 2‰ in October 1981 resulting in mass fish mortality. However, no *C. spatulatus* were observed to have died as a result of the low salinities.

*Clinus spatulatus* is the only South African clinid having its major population in an estuary. All seine hauls were made in marginal areas at depths of less than 1.7 m. These areas were vegetated by dense stands of aquatic macrophytes, predominantly *Ruppia maritima* and *Cladophora* sp. but also including *Potamogeton pectinatus* and *Chara* sp. Rocky areas were not sampled and it is therefore not known whether *C. spatulatus* occur in these areas.

*C. spatulatus* occurred in 80.6% of the 36 seine hauls and was numerically the fourth most abundant species in the catches, occurring in an estimated density of 0.04 fish m<sup>-2</sup> (0.08 g m<sup>-2</sup>). The three most abundant species were *Hepsetia breviceps*, *Gilchristella aestaurius* and *Psammodobius knysnaensis*.

The contents of 50 stomachs (Fig. 6) were analysed using the occurrence and volume methods (see Hynes 1950). Amphipods, mainly *Melita zeylanica* and *Corophium trienonyx*, occurred in 93.6% of stomachs and comprised 31.6% of the total volume of food consumed. Isopods, represented almost entirely by *Exosphaeroma hylecoetes*, occurred in 63.8% of guts and provided 34.9% of the volume. Other important dietary constituents were gastropods (*Tomichia* sp. and *Hydrobia* sp.) at 12.8% occurrence and 22.6% by volume respectively and insects, mainly chironomid larvae, which occurred in 52.5% of guts and constituted 3.7% of the volume. *Clinus spatulatus* is therefore a generalist carnivore, consuming very similar prey to marine clinids in the same area (see Bennett et al. 1983 in press).



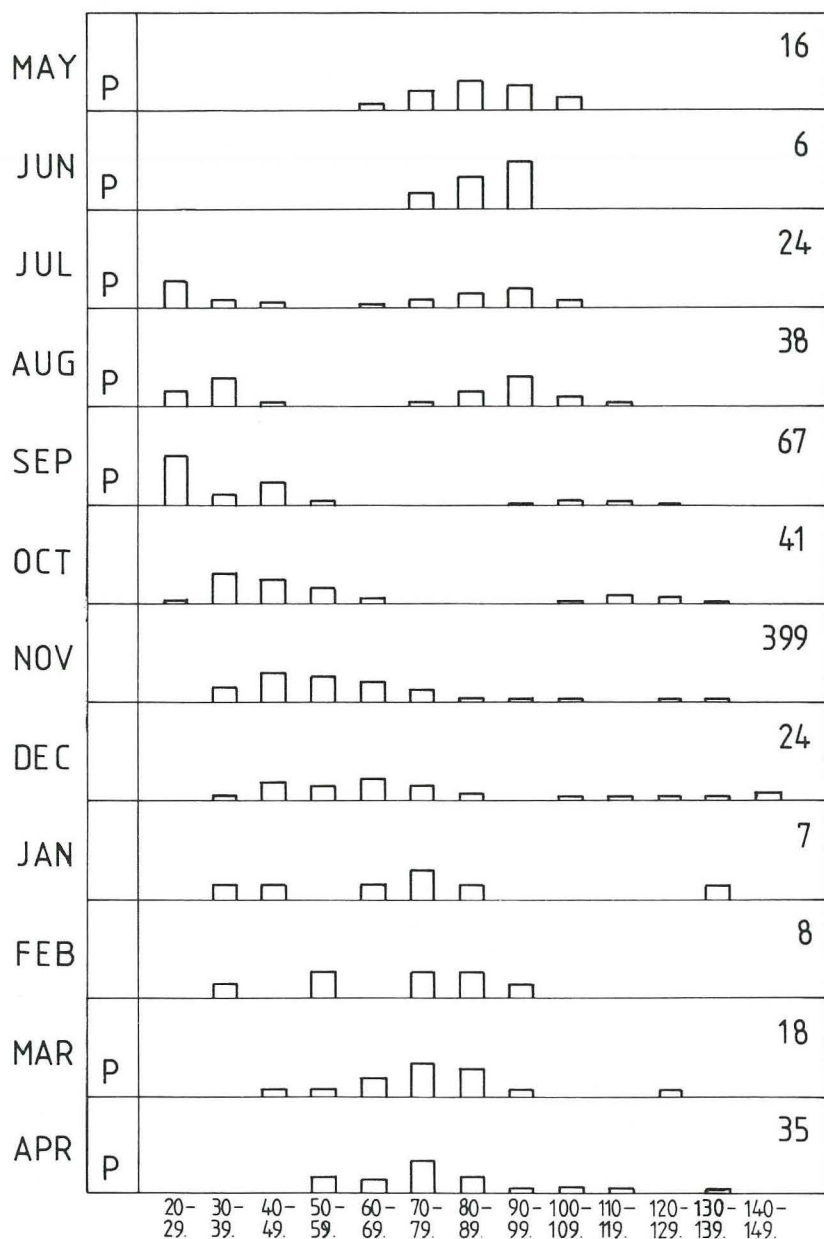


Figure 5. Size/frequency distribution of *Clinus spatulatus* sampled at monthly intervals from Botrivierlei. Shifts in modal sizes give an indication of growth. Months in which at least one female contained embryos exceeding 15 mm TL are marked "P" in the left column.

**REPRODUCTION:** The sex ratio of *C. spatulatus* in the catch was one male to approximately 15 females. Females appear to mature in their first year at a length of 75-80 mm TL. Embryos in an advanced stage of development (>15 mm) were present between March and September and small juveniles (20-40 mm) appeared in the catches between July and September.

**GROWTH:** Apparent growth, estimated from modal progressions (Fig.5), was 5.4 mm TL  $\text{mth}^{-1}$ . Modal size increased from 25 to 90 mm TL in one year. Few fish appeared to survive for more than 18 months by which time they had attained a size of approximately 130 mm TL. The largest specimen, a female taken from the adjacent Kleinmond estuary, was 172 mm TL.

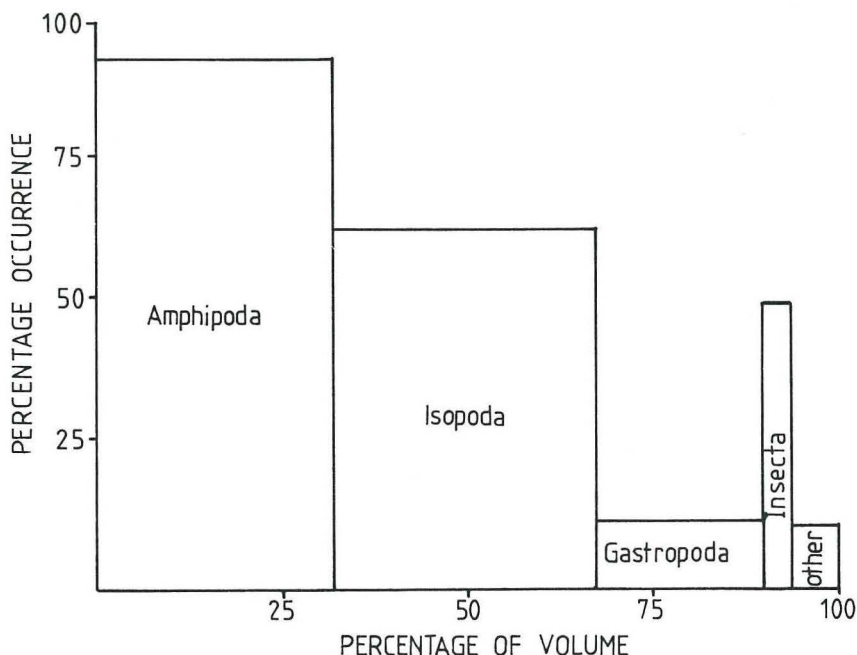


Figure 6. Relative importance of major food items consumed by *Clinus spatulatus*.

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TABLE 1. Variation in meristic characters of a sample of *Clinus spatulatus*.

Number of elements	2	3	4	5	6	7	8	...	13	14	15			
Dorsal fin rays					1	31	18							
Pelvic fin rays	2	18												
Pectoral fin rays									12	37	1			
Epibranchial gill-rakers	3	15	2											
Ceratobranchial gill-rakers					2	16	2							
Number of elements	17	18	....	23	24	25	....	28	29	....	32	33	34	35
Precaudal vertebrae	1	19												
Caudal vertebrae								1	19					
Anal fin rays				10	16	24								
Dorsal fin spines											1	15	24	10

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