

TABLE I
Effects of enovid on liver nucleic acids, protein and lipids

Treatment	Liver						
	Weight		Nucleic acids		Protein	Lipid	Cholesterol
	Actual gm.	gm./100 gm. body weight	RNA mg./gm. tissue	DNA mg./gm. tissue	Total mg./gm. tissue	Total mg./gm. tissue	Total mg./100 mg. tissue
Enovid ..	7.14	4.05	4.33	3.19	16.5	60.0	0.226
	±0.307	±0.110	±0.122	±0.237	±0.556	±1.91	±0.025
Control ..	7.02	3.86	6.41	3.70	18.1	50.6	0.133
	±0.375	±0.187	±0.245	±0.153	±0.287	±2.33	±0.004

6 animals were taken in each group.

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Department of Zoology,
University of Delhi,
Delhi, November 17, 1969.

P. K. PAUL.

Gobiosoma diadematum by Regan³ and Barnard⁴ and *Heteroleotris diadematum* by Smith.⁵ However, Smith¹ brought out the synonymy involved and has restricted it to *H. zonatus*. The Indian specimens differ from the earlier descriptions in minute details and hence a brief description is given here.

Heteroleotris zonatus (FIG. 1)

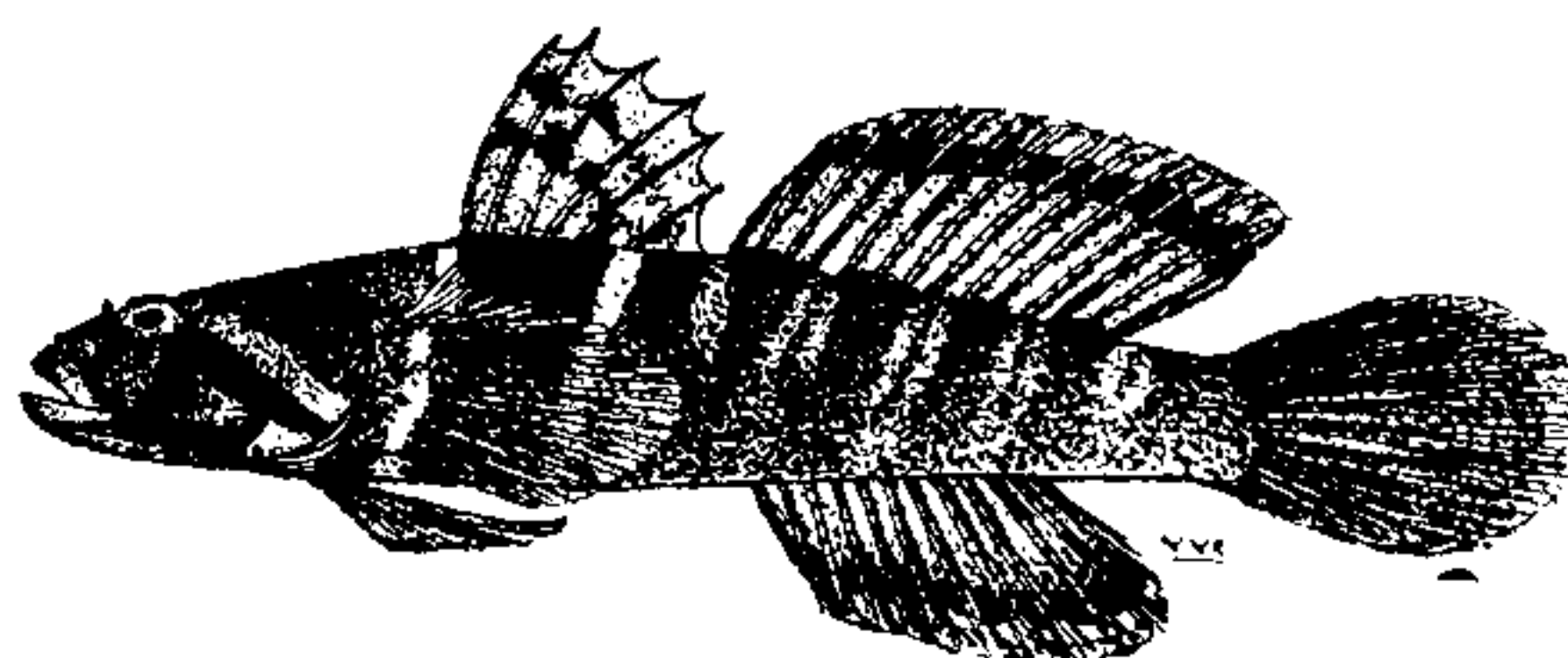


FIG. 1. *Heteroleotris zonatus* (Fowler), total length 49 mm.

D₁ 6; D₂ 1 + 13; A 1 + 11-12; P 17; V 1 + 5; C 17; LI about 47; Tr. about 18; Vert. 27.

Body elongate, cylindrical anteriorly, compressed posteriorly; depth 5.3-6.7, head 3.5-3.9 in standard length. Head broad, depressed, narrow before eyes; prominent rows of papillae on snout, cheeks, opercle and top of head. Short vertical rows of papillae along middle of body and a few on belly. Eye 4-4.5 in head, almost equal to snout, a little more than inter-orbital. Mouth oblique, lips rather thick, maxilla reaches to front edge of eye. Dentition as accurately described by Smith¹: "In upper jaw, a single outer widespread series of curved caniniform teeth, 2 on side longest, inside a moderate band of villiform teeth, a few median behind enlarged. In lower jaw in front on each side 3-4 recurved caniniform teeth, inside these a band of villiform teeth, behind these on side 1-2 recurved caniniform teeth." Palate edentulous. Tongue truncate. Gill openings restricted to pectoral base, rakers absent, 7-9 round knob-like projections on either side of the gill arch.

OCCURRENCE OF *HETERELEOTRIS ZONATUS* (FOWLER) IN INDIAN WATERS

Heteroleotris zonatus (Fowler) has so far been recorded only from South African coast between Port Alfred and Zululand.^{1,2} Five specimens of this species 37-49 mm. long have been collected from the tide pools at Visakhapatnam during 1965; this is the first record of *H. zonatus* from Indian waters. This species has been described as *Leioleotris zonatus* by Fowler,²

* Messrs. G. D. Serale Co., Chicago, U.S.A.

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First dorsal incision well behind pectoral base, height equals depth of body; 2nd dorsal origin midway between eye and caudal base, height a little more than that of body. Anal origin below 3rd dorsal ray, height same as body. Pectoral rounded, shorter than head, upper two rays divided at half length, filamentous, the 1st attached a little above base to the 2nd whose lower branch is attached to the 3rd, tips of 3rd ray extend beyond the membrane. Ventral 2/3 in head. Caudal rounded, as long as head.

Body covered with embedded cycloid scales, none before line between 2nd dorsal origin and upper edge of pectoral base and anal origin and lower edge of pectoral base. Head, nape and pectoral base naked.

Head and body pink-brown, top of snout darker. A narrow dark brown band from front of eye to middle of maxilla, one broad band obliquely from behind eye to angle of opercle, preopercle darker. A dark brown area a little behind eye extends obliquely from top of head to upper half of opercle. A blackish spot, a little less than eye, above the extremity of preopercular groove. A broad blackish-brown band below spinous dorsal with narrow lighter areas in front and behind; behind this about 6 dark vertical bands alternate with lighter areas extending from dorsal profile to midside, merge in the lower half of body, the lighter areas usually with a dark vertical line in the middle. Fins pink-brown, spotted brown, 1st dorsal greyish with two curved dark bands from upper half to behind 5th spine. Second dorsal, anal and caudal with lighter free margins, the first two with black submarginal bands. Anterior third of pectoral densely spotted becoming lighter posteriorly, a lighter area behind the darker base.

In addition to having darker colouration and more area devoid of scales on body, the Indian specimens also have 1-2 extra rays in the anal fin and two filamentous rays in the pectoral.

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Dept. of Zoology, V. VISWESWARA RAO.*
Andhra University,
Waltair, November 3, 1969.

* Present address: Central Regional Station, Zoological Survey of India, Jabalpur.

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ON THE PRESENCE OF VITAMIN A IN THE MEDIAN EYES OF THE SCORPION, *HETEROMETRUS FULVIPES*

ABSTRACT

Purified preparations of vitamin A were made from the median eye-tissues of the scorpion, *Heterometrus fulvipes* through column chromatography. It was identified to be vitamin A through the Carr-Price test. *Heterometrus fulvipes* is the first arachnid in which the presence of vitamin A has been reported.

IN contrast to the vertebrates the role of vitamin A in invertebrates remains rather uncertain. Conflicting reports about the presence or otherwise of vitamin A in insects have appeared.¹ But in the crustaceans about 90% of the vitamin A of the entire body is found in the eyes.² While this is the state of our knowledge about the presence and the role of vitamin A in these two major groups of arthropods, nothing is known about other arthropods. However, retinene₁ (vitamin A₁ aldehyde) has been reported in *Limulus polyphemus*.³

In this note the presence of vitamin A₁ in the median eyes of an arachnid, the scorpion, *Heterometrus fulvipes* is reported.

Heterometrus fulvipes were collected from the hills around Tirupati. They were maintained in glass vivaria, containing a one inch layer of moist soil at the bottom, and were fed with cockroaches once in four days. Animals were always used within a fortnight of their capture from the source.

The method followed for the extraction and chromatography was as described by Cohen and Barker.¹ The median eyes were separated from the animals and the tissue was ground with anhydrous sodium sulphate and extracted with acetone. After evaporation, the residue was taken up in petroleum ether. The extract was introduced into a column of aluminium oxide and was eluted with 4%, 10% and 25% acetone in petroleum ether. After evaporating the solvent in each eluate under vacuum, benzene was added and flushed with nitrogen.

Immediately, after the addition of Carr-Price reagent (antimony trichloride in chloroform) to the benzene eluate, taken in a microcuvette, optical density measurements were made from