

San Juan islands, Washington State, U.S.A. The ovaries were fixed in Bouin's fluid and Zenker-formol. Paraffin sections were cut at 5 and 7 μ m thick and stained in Heidenhain's iron haematoxylin-eosin and Hansen's iron trioxyhaematin.

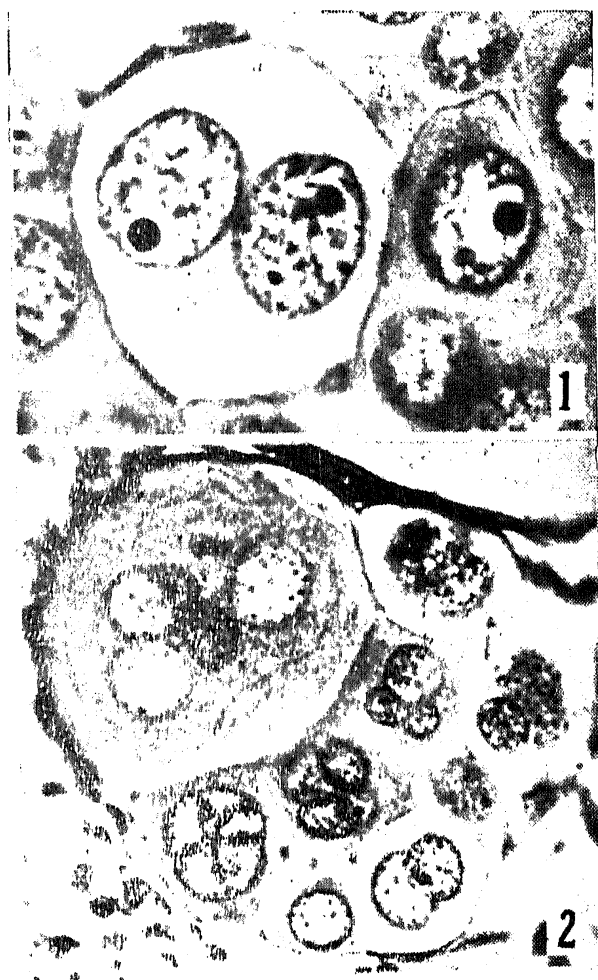
Although the multinucleated condition was largely seen in the primordial oogonial cells, few early stage-I oocytes also exhibit this feature. In mammals some authors¹ favour the theory of fusion of two adjacent uninuclear germ cells to form the binuclear oocytes. In *P. notatus* the multinuclear condition was apparently obtained by repeated division of the nucleus which is not accompanied by the division of the cytoplasm. Such nuclei often vary in size and were crowded together inside the cell. Some of them exhibited pyknotic changes also (Fig. 2). In the binuclear oocytes of *P. notatus* the nuclei appeared normal and of uniform size (Fig. 1). However, no evidence was noticed to

might be abortive oocytes which ultimately degenerate or as they grow they might become uninucleate due to the degeneration of the superfluous nuclei.

I am grateful to the Population Council of the Rockefeller Institute, New York, for the award of a Post-Doctoral Fellowship which made my trip to the Friday Harbor Marine Biological Laboratories possible. I am indebted to Dr. R. L. Fernald, Director of the above laboratories, for providing laboratory and specimen collection facilities.

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1. Gopesh Bhatnagar and Thapliyal, J. P.,
Curr. Sci., 1961, 30, 304.



FIGS. 1-2. Fig. 1. A single binuclear oocyte, $\times 1,000$. Fig. 2. Showing bi- and multinuclear oocytes. The larger oocyte exhibits a pyknotic nucleus, $\times 1,000$.

suggest that they were formed by the fusion of two neighbouring oocytes. Beyond the early stage-I growth phase of the oocytes, bi- or multinucleated conditions were not observed. It is likely that these

THE OCCURRENCE OF *CYNOGLOSSUS DUBIUS* DAY OFF KERALA COAST

THE description of *Cynoglossus dubius* given by Day¹ is based on a single specimen and he has recorded the species as from Sind and Baluchistan. Norman² redescribed the species and mentioned 'Sind, Baluchistan and Travancore' as its habitat. Neither Weber and Beaufort³, Munro⁴ nor Smith⁵ made any mention of this species. Apparently it seems to have a limited distribution and is probably confined to the Indian waters. Recently this species has been obtained in the hauls made by the trawler *Blue Fin*, off Alleppey at a depth range of 19-25 fathoms. The species is scarce in the catches and in between August and October 1970 only eight specimens could be collected from this vessel. But it is reported to be abundant in the hauls made off Calicut by the commercial trawlers as mentioned in the Annual Report of the Central Marine Fisheries Research Institute for the year 1970. In the Cochin area they are not obtained in the regular hauls probably because the trawlers usually fish for prawns and the trawling is often confined to around 15 fathoms. Because of their scarcity in the regular trawl hauls off Cochin and since it is caught by *Blue Fin* at depths between 19 and 25 fathoms it appears that the species occupies somewhat deeper waters. Further studies on their distribution might throw more light on the distribution pattern and may also confirm that they are more common on the west coast of India especially off Kerala. And this is called for since the species belongs to the larger varieties of *Cynoglossus* and hence will be preferred commercially to the smaller species.

TABLE I
Meristic and non-meristic characters of *Cynoglossus dubius*

Total length cm	Length of head cm*	Height of head cm	Length of head in proportion to height of head	Height of body cm†	Dorsal fin ray	Anal fin ray	Ventral fin ray	Caudal fin ray	Lateral line scales‡
26.1	6.3 (4.14)	5.5	1.145	6.1 (4.28)	112	87	4	11	110 (-)
26.3	6.5 (4.05)	5.7	1.140	6.5 (4.05)	110	..	4	..	110 (-)
29.6	7.0 (4.23)	6.2	1.129	7.0 (4.23)	110	..	4	9	113 (19)
30.8	7.4 (4.16)	6.55	1.130	7.5 (4.11)	111	89	4	9	- (18)
31.4	7.5 (4.19)	7.1	1.056	7.7 (4.08)	..	87	4	10	115 (-)
32.6	8.1 (4.02)	7.0	1.157	8.3 (3.93)	111	86	4	10	115 (19)
35.4	8.6 (4.12)	7.9	1.089	9.3 (3.81)	- (-)
35.7	8.1 (4.41)	7.9	1.025	9.35 (3.82)	115 (19)

* Figures in parenthesis represent length of head in the total length. † Figures in parenthesis represent height of body in the total length. ‡ Scales are counted from behind the junction formed by the lateral lines and located above and anterior to the operculum (Fig. 1). The figures in parenthesis represent the number of oblique rows of scales separating the two lateral lines at the greatest distance between the two.

The description given by Day is based on a single specimen and the account is not fully authentic. For instance it has only one lateral line on the ventral side and not two as pointed out by Day. Hence the following description of the species is given to enable easier identification.

The measurements are all made on specimens preserved in 10% formalin. Two of the largest ones were somewhat affected by shrinkage due to preservation and due to the small size of the containers. Consequently not all the body measurements taken on these two specimens are very reliable. The remaining ones were also not obtained in perfect condition and often their scales are lost due to the effect of trawling. However as many characters as could be obtained from them were measured.

There are two lateral lines on the coloured side and one on the blind side. The two lateral lines on the coloured side are separated at their greatest distance by 18 or 19 oblique rows of scales. Scales are cycloid on both sides which is a very distinguishing feature for this species, since the only other species of *Cynoglossus* described so far with cycloid scales on both sides is *C. monodi* Chabanaud known from W. Africa in which the scales of the last quarter of the length of the body of the upper side are however somewhat weakly ctenoid. In *C. arel* (Bloch and Schneider) the spinules on the ocular side are inclined to wear off in preserved specimens so that the scales may appear to be

cycloid. Upper eye is located slightly in advance of the lower. Of the two nostrils one is located in between the two eyes and the other, tubular nostril, is situated just below and anterior to the lower eye. The lips are smooth and are not fringed. The other main characters are entered in Table I and a photograph of the species is shown in Fig. 1.

As can be seen from Table I and the above description of this species, the account given here bears similarity in many respects with that given by Day for *C. dubius* especially in the fin ray counts, number of lateral lines on the coloured side, in possessing cycloid scales on both sides and in respect to the proportional size of the head in relation to the total length. But it also differs in some other respects such as the number of scales along the lateral line on the coloured side, in the number of rows of scales separating the two lateral lines at their greatest distance, in the proportional height of the body in relation to the total length and in having only one lateral line on the blind side.

We are grateful to Dr. N. K. Panikkar, Director, National Institute of Oceanography, for constant encouragement and to Dr. A. G. K. Menon, Zoological Survey of India, for reading the manuscript and suggesting improvements. The authors are also grateful to Shri M. C. Perumal, Director, Central Institute of Fisheries Operatives, for permission and to the crew of their trawler, *Blue Fin*, for the co-operation in collecting samples.

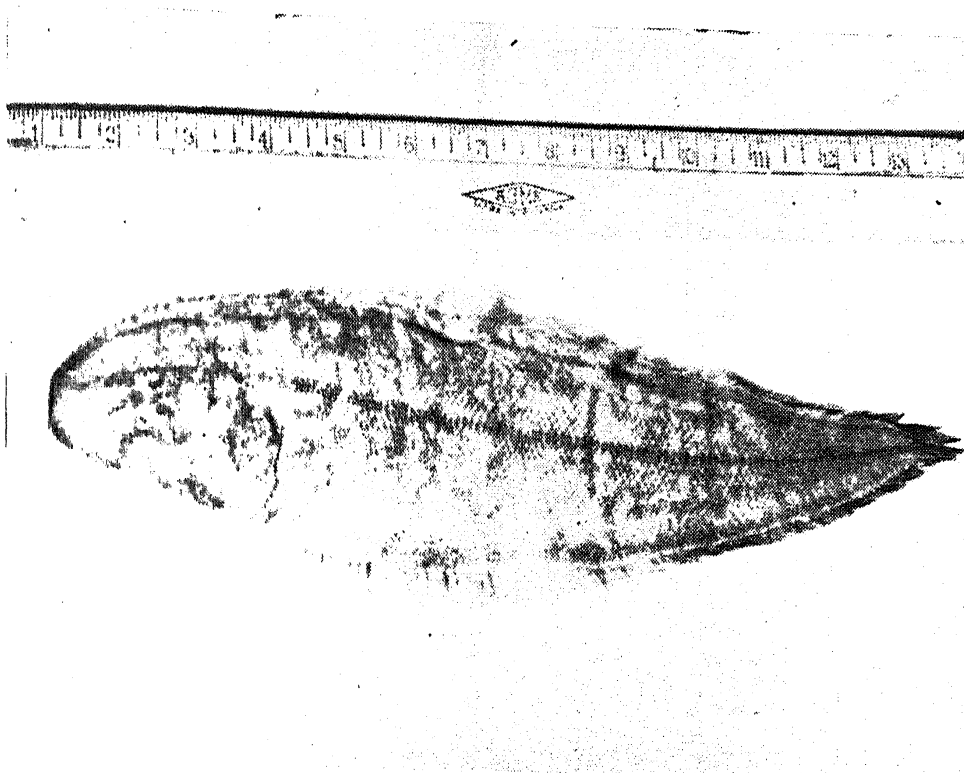


FIG. 1. Photograph of *Cynoglossus dubius* caught off Alleppey at a depth of 19-25 fathoms. The specimen measured 32.6 cm in total length.

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1. Day, F., *The Fishes of India*, London, 1877.
2. Norman, J. R., "The flat fishes (Heterosomata) of India, with a list of the specimens in the Indian Museum," *Rec. Indian Mus.*, 1928, 30.
3. Weber, M. and Beaufort, L. F. De., *The Fishes of the Indo-Australian Archipelago*, V., E. J. Brill Ltd., Leiden, 1929, p. 458.
4. Munro, I. S. R., *The Marine and Freshwater Fishes of Ceylon*, Dept. Extl. Affairs, Canberra, 1955, p. 349.
5. Smith, J. L. B., *The Sea Fishes of Southern Africa*, Central News Agency, Ltd., S. Africa, 1961, p. 580.

INHERITANCE OF HULL COLOUR IN CROSSES INVOLVING RICE VARIETY DUNGHANSHALI

DIFFERENT patterns of hull (Lemma and Palea) colour in rice, both at flowering and ripening, have been described by Hutchinson and Ramiah¹. The ripening colour of lemma and palea acts independently of the colour at flowering. Inheritance of ripening black hull has been attributed to either simple dominance of ripening black over straw hull or due to complementary factors for development

of black hull³⁻⁵. However, in the present study Dunghanshali, a Hungarian variety with straw hull when crossed with certain parents with straw hull, gave F_1 with black hull colour at maturity. The inheritance of hull colour at ripening was studied in five crosses, using Dunghanshali as common parent. Dunghanshali is a cold tolerant variety and is being utilised at Central Rice Research Institute, Cuttack, for breeding high yielding varieties with cold tolerance.

The hull colour of the parents and F_1 's at the time of maturity is presented in Table I.

TABLE I

Parents	Hull colour	F_1 's	Hull colour
Dhunganshali	Straw	Dunghanshali × IR 8	Black
IR 8
Jagannath	..	Dunghanshali × Jagannath	..
Taichung Native-I	..	Dunghanshali × T.N.I.	..
Bank Ch. 27	..	Dunghanshali × Baok	Straw
	..	Dunghanshali × Ch. 27	..

The F_1 of the crosses Dunghanshali with IR 8, Jagannath and Taichung Native-I have developed ripening black hull. F_1 's with black hull segregated into ripening black, ripening straw and gold hull and these were used in Chi-square test of goodness of fit. The ratios observed for the ripening black, straw and gold hull were found to be in close agreement with the 9 : 6 : 1 theoretical.