Table 1. GEOGRAPHICAL DISTRIBUTION OF DIPLOID NUMBERS IN PENTATOMIDAE

	$2n = 14$	$2n \neq 14$	Total
Tropical and sub-tropical spp.	40	2	42
Temperate spp.	58	19	77
Total	98	21	119

higher systematics of the superfamily. Applying a new classification of Pentatomoidea (unpublished) and deleting species of doubtful determination or uncertain provenance, there remain 119 cytologically known Pentatomidae *sensu stricto*: these may be grouped as in Table 1. The ancestral diploid or type number, which here happens to coincide with the modal number, is 14; $12A + X + Y$ in males.

Inspection of Table 1 shows a statistically significant ($P = 0.029$) association of atypical karyotypes with a temperate climate. The systematic positions of the atypical species and the presence of genera with a *Thyanta*-like range and karyotype pattern show that the association is not with a Holarctic distribution or monophyletic block although all the temperate forms so far examined live in the Palearctic or Nearctic.

The present facts suggest either that: (1) rearrangements accompanying speciation in temperate climates tend, under the influence of some external factor, to be more often associated with gross karyotype changes than is the case in the tropics; or (2) gross changes, when they occur, are differentially selected and confer an enhanced survival value in temperate areas. In attempting an evaluation of these two hypotheses it must be remembered that the behaviour and general biology of shieldbugs show that the tropics provide optimum conditions for the group, while the rich fauna suggests it is also the area of maximum speciation.

Dr. R. E. Blackith, of the Imperial College of Science and Technology, London, has kindly assisted me with the statistical analysis.

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¹Manton, I., Symp. Soc. Exp. Biol., 7, 174 (1953).

²Schrader, F., and Hughes-Schrader, S., *Chromosoma*, 7, 469 (1956).

Sexual Colour Differences in *Caranx ignobilis* (Forsk.)

Caranx ignobilis (Forsk.), the largest of the Indo-Pacific carangids, is a valued food fish from the East African coast to the Hawaiian Islands. The biology of this fish is being studied by one of us (F. W.), and it has been found that maturity is reached between 500 and 650 mm. standard length.

Routine observations on catches have shown that in specimens more than 500 mm. long there is a difference in colour with sex. The male has a dusky to black body, head and fins. In the female the body and head are pale to silvery, except for slight dusiness on the back. Small black dots may or may not be present on the upper sides of the body. The fins are pale to dusky hyaline.

These colorations refer to living and freshly caught specimens, as some hours later both sexes become a uniform dusky grey.

Sex prediction tests were carried out on a sample of 88 specimens, standard length 500–1,150 mm., and were correct in 90 per cent of cases. These colour differences develop with maturity. Most errors occurred in the size range 500–700 mm., and may have been immature fish. With specimens more than 700 mm. long prediction was nearly 100 per cent correct.

To our knowledge, these are the first recorded sexual colour differences in the Carangidae.

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Low Vitamin B₁₂ Concentrations in Serum in Fish Tapeworm Anæmia

VARIOUS communications have been published on the microbiological vitamin B₁₂ activity in the sera from both healthy persons and patients suffering from various diseases. The concentration of vitamin B₁₂ varies fairly considerably in normal people. The lower limit is 70–100 µg/m. and the upper 420–900 µg/m. vitamin B₁₂/ml. of serum, depending on the microbiological method employed. Very low values, usually less than 50 µg/m./ml., have been found in pernicious anæmia¹.

Megaloblastic anæmia in fish tapeworm (*Diphyllbothrium latum*) carriers shows a similar hæmatological picture to that of genuine pernicious anæmia. The essential factor in the origination of this anæmia would seem to be vitamin B₁₂ deficiency caused by fish tapeworm which deprives the host organism of vitamin B₁₂². However, there is still a lack of data on the serum vitamin B₁₂ concentration in this disease. We therefore determined the microbiological activity in the serum of eight patients with fish tapeworm anæmia. Twenty convalescents who had been treated for different diseases were examined as controls.

Table 1. MICROBIOLOGICAL B₁₂-VITAMIN ACTIVITY IN SERA FROM EIGHT PATIENTS WITH FISH TAPEWORM ANÆMIA AND FROM TWENTY CONTROLS

Diagnosis	Sex	Age	Vitamin B ₁₂ (µg/m./ml.)
Anæmia perniosa diphyllbothrica	♂	38	< 50
" " "	♂	17	< 50
" " "	♂	14	< 50
" " "	♂	11	< 50
" " "	♂	64	< 50
" " "	♂	58	< 50
" " "	♂	63	65
" " "	♂	84	< 50
Hypertensio arterialis	♂	59	605
Cholecystitis	♂	70	428
Hernia inguinalis	♂	61	720
Anæmia perniosa diphyllbothrica	♂	17	361
in remission induced by worm cure	♂	63	733
Apoplexia cerebri	♂	65	320
Cardiosclerosis	♂	63	238
Anæmia hypochromica	♂	36	583
Ulcus ventriculi	♂	56	420
Anæmia perniosa in remission induced by liver extract	♂	37	424
Polycythæmia vera	♂	57	940
Pneumonia lobaris	♂	42	644
Nephritis chronica	♂	71	360
Thyreotoxicosis	♂	62	200
Cardiosclerosis	♂	69	180
Hernia diaphragmatica	♂	69	370
Nihil	♂	23	601
Cholecystopathia	♂	52	786
Arteriosclerosis universalis	♂	76	444
Diabetes mellitus	♂	57	964