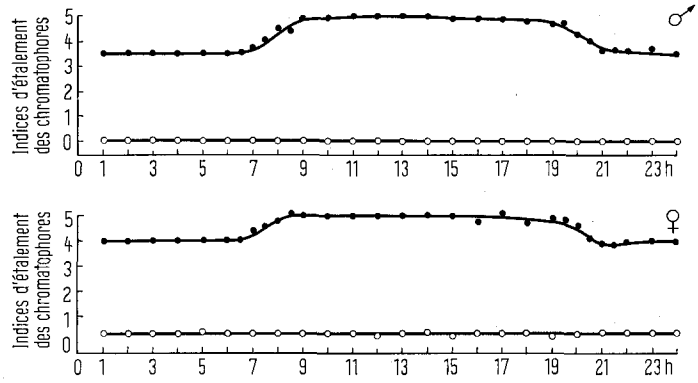

Fig. 1. Rythme nycthéméral d'*Hippolyte varians*. Livrée de type uniforme vert: pigment vert (points noirs), pigment brun (points blancs). Moyennes faites, pour chaque point, à partir de 64 relevés chez les ♂ et de 86 chez les ♀.

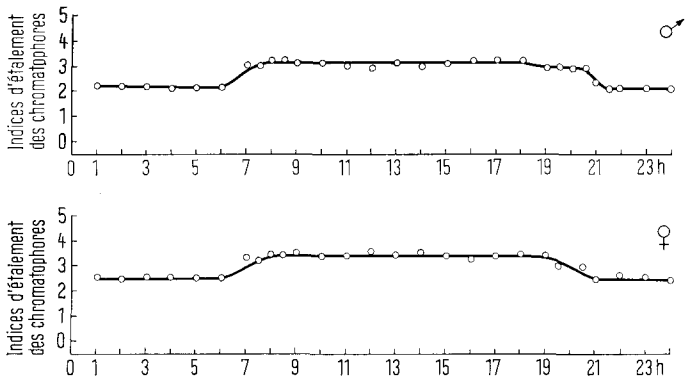

Fig. 2. Rythme nycthéméral d'*Hippolyte varians*. Livrée de type hétérogène brun: pigment brun (points blancs). Moyennes faites, pour chaque point, à partie de 92 relevés chez les ♂ et de 43 chez les ♀.

Pigment brun: en phase diurne, le pigment brun atteint l'indice 3,3 chez les mâles et 3,5 chez les femelles. En phase nocturne, il descend à l'indice 2,1 chez les mâles et 2,5 chez les femelles. La concentration du pigment brun est toujours accompagnée de la diffusion d'un pigment bleu-vert qui donne, la nuit, une couleur générale bleutée à l'animal.

Discussion. A l'issue des résultats que nous venons d'exposer, plusieurs remarques s'imposent. Le fait le plus frappant est le comportement exactement inverse du pigment brun, selon qu'il se trouve intégré à la livrée uniforme verte ou à la livrée hétérogène brune; dans le premier cas, il ne montre aucun changement périodique alors que, dans le second, il présente un rythme nycthéméral net. Un deuxième fait se dégage: c'est la différence de capacité de migration pigmentaire qui existe entre les mâles et les femelles. On observe, en effet, une expansion pigmentaire plus élevée chez les femelles que chez les mâles. Un tel comportement lié au sexe avait déjà été constaté sur d'autres Natantia[14,6].

Cette analyse doit nécessairement être poursuivie pour déterminer les mécanismes endocrines qui contrôlent le rythme nycthéméral; une telle étude sera faite en nous basant sur les connaissances récemment acquises chez les autres Crustacés Décapodes.

Summary. Hippolyte varians passes through a daily colour-cycle, but a given pigment shows an opposite behaviour according to the chromatophore pattern. A significant variation in the state of concentration of pigments is observed in males and females.

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The Origin of Progesterone in the Confused Flour Beetle *(Tribolium confusum)*

In a few instances, vertebrate steroid hormones have been isolated from invertebrate sources[1-6]. Particularly, pregnenolone, progesterone and dehydroepiandrosterone have been isolated and rigorously identified in the confused flour beetle (*Tribolium confusum*)[4]. Since the inability of all insects to synthesize the steroid nucleus is now generally recognized[7,8], two possibilities exist to account for the origin of these steroids in *T. confusum*. The first possibility is that they are derived from the metabolism of the dietary sterols and the second possibility is that the steroids are simply taken up from the diet of these insects. The diet of *T. confusum* is composed mainly of wheat flour to which 5% dry brewer's yeast is added. This diet has never been analyzed for its steroid content. To test the hypothesis that steroids in *T. confusum* are derived from its dietary source we measured

quantitatively the concentration of progesterone in the insect at 2 stages of development: 12–13-day-old larvae and 8–9-day-old adults and in their diet.

The starting material was 60 g of larvae, 49 g of adults and 100 g of diet. At the beginning of the extraction procedures, a tracer amount of progesterone-7-^{3}H was added to determine the recovery. The fresh tissues and the diet were extracted with chloroform:methanol (2:1)[9]. After evaporation of the solvents, the residue was partitioned between hexane and 90% methanol. The residue of the aqueous methanol phase was further purified by column chromatography, thin-layer chromatography, acetylation and thin-layer chromatography again. The identification of progesterone was done by its mobility on thin-layer chromatography, before and after acetylation and by gas-liquid chromatography.

Progesterone appeared to be present in the larvae and in the adults of *T. confusum* and also in their diet. The concentration of progesterone determined from the gas-liquid chromatographic areas after correction for the recovery was as follows: larvae 23 µg/100 g; adults 17 µg/100 g; diet 9 µg/100 g.

If we compare the concentration of progesterone found in the wheat flour with that earlier reported in apple seeds[10], we notice that the latter contains relatively much higher concentration (approximately 6 times) of this steroid.

The present study has shown that the steroids, particularly progesterone, in *T. confusum* might indeed come from its dietary source since the concentration of this steroid in the insects and in their diet is of the same order of magnitude. The relatively higher concentration in the insects could be explained by the accumulation of progesterone in the tissues particularly during the most active feeding period of larval growth. The fact that RITTER and MEIJER[11] have been unable to detect steroids in *T. confusum* might possibly be explained by a different source of wheat flour used for rearing this insect.

Résumé. La progestérone présente dans les tissus de *Tribolium confusum* (coléoptère) tire probablement son origine de la ration alimentaire puisque la concentration de ce stéroïde est du même ordre de grandeur dans l'insecte et dans la ration alimentaire.

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Compensatory Hypertrophy of the Contralateral Testis after Unilateral Castration in the Toad, *Bufo melanostictus* (Schn)

Studies on compensatory hypertrophy of the contralateral gonad after unilateral castration in lower vertebrates are sporadic and meagre. These studies involve the female sex only[1–4]. In mammals extensive studies have been made[5–8], but as to its occurrence in the male there is much controversy[7]. Thus, realizing the need for research on compensatory hypertrophy on the male side, this study was undertaken in the male toads.

Gravid male toads weighing 25–40 g, caught in Mysore City (India), were maintained in semi-moist cages. They were unilaterally castrated under light ether anaesthesia and their right testis removed. These operated toads were force-fed with minced meat once a day. On the 10th day they were autopsied and the remaining testis were dissected out, weighed on a torsion balance, fixed in Bouin's fluid, paraffin sections cut at 8 µ thick and stained in iron haematoxylin. The sections were observed and measured for changes and calculated results are shown in the Table. These studies were made in August and September, and a total of 25 toads were used for these studies.

There is an increase in the weight of the remaining left intact testis (55.6 ± 5.5), 10 days after unilateral castra-

Effect of hemicastration on the intact contralateral testis

Testis	Wt. of the testis/100 g body wt. (mg)	Average diamter of the testis (µ)	Average diameter of the seminiferous tubules (µ)	Average No. of sperm bundles per seminiferous tubule	Average No. of cell nests per seminiferous tubule	Interstitial cells
Testis removed at operation (10)	107.2 ± 8.2	1191.6 ± 55.3[a]	175.2 ± 2.9	5.4 ± 0.90	5.9 ± 0.75	+++
Contralateral testis removed after 10 days (10)	163.3 ± 12.6[c]	1694.9 ± 63.8[b]	328.7 ± 11.9[b]	6.6 ± 0.93	8.6 ± 0.59[d]	++++

[a] Standard error; [b] probability: > 0.001; [c] < 0.001; [d] < 0.01. Number of toads in parentheses. Normal average difference between right and left testes of an animal = 12.8 ± 1.6.