Some abnormalities found in the marine copepod, *Tigriopus japonicus* Mori.

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Introduction

The present study was carried on in 1935 in the Zoological Institute of the Kyoto University as a graduation thesis under the direction of Prof. T. Komai. The material had been cultured mainly as for the study of heredity. Naturally, abnormal individuals were looked for. But later the material was turned over to the object of the study of sex determination, and I had to drop the work of seeking for such individuals unfinished and incomplete. But, since I have no prospect of taking it up again in the near future, I think I had better describe briefly the abnormalities thus far observed in this copepod. Of the abnormalities the majority is deformation due to injuries received in larval stages. Of the other kinds of abnormalities, duplications and sex intergrades are of special interest.

I. Duplications and supernumerary spines on legs

(1) Case I, adult female (Fig. 1). The second leg on either side has two spines instead of one inside the second segment of the exopodite, and the terminal segment carries 9 spines instead of 7. This female has also the third right leg (Fig. 1-II), showing such abnormalities as :- the exo-

Fig. 1.

- I. The exopodites of the second legs.....A. Abnormal, B. Normal
 II. The third legs.....A. Symmetrical, B. Normal
 III. The terminal segments of the fourth legs.
A. Abnormal, B. Normal
 IV. The fifth legs.....A. Abnormal, B. Normal

podite is nearly bilaterally symmetrical about the longitudinal axis; the endpodite is still in the stage of copepodid III; the protopodite is also duplicated; the fourth legs (Fig. 1-III) have terminal segments bearing 8 spines instead of 7; the fifth legs (Fig. 1-IV) also show duplication like in the third legs. It is interesting that in this individual the abnormalities are shown in many parts of the appendages. No progeny of this individual was obtained.

(2) Case II, an adult male (Fig. 2-A). The second legs have two spines instead of one on the inner margin of the second segment of exopodite. The same abnormality was found in many individuals reared in the same finger bowl; the majority of them, however, had such abnormality on the right or on the left leg only. This male, alone, had abnormal legs on both sides.

Fig. 2. Heritable abnormality in the second leg. The second leg has two spines instead of one on the inner margin of the second segment of exopodite. It is a variable character and often appears in an imperfect manner as shown in B or C.

This kind of heritable abnormality often appeared differently on both sides, or on one side, right or left, only.

This male, crossed with a normal unrelated female, gave some offspring with similar abnormality; the F_1 were all normal, while F_2 were as shown in Table 1.

Table 1. F_2 from (Abnormal $\delta \times$ Normal φ)

Total number	Normal	One leg abnormal	Both legs abnormal
230	119	92	19
		111	

Thus it was shown that the abnormality is undoubtedly a heritable character, although it is not clear, what kind of gene is responsible for it. High temperature which followed exterminated the strain.

II. Sex Intergrades

I have confirmed (1939, 1941, 1948) that the sex of this copepod is significantly influenced by environmental conditions. But singularly, few intersexes have been found so far as the external characters are concerned. Thus far, I have seen only two intersexes, one in 1935 among the material from the shore, and the other among the lots of temperature experiments in 1941.

(1) Case I. (Fig. 3-II). First antennae intermediate in structure between those of a male and a female (Fig. 3-I); the remaining parts are of a normal female. This female was crossed with an unrelated male and produced 50 normal males and normal females, without any intersexual offspring.

(2) Case II. (Fig. 3-III). First antennae intermediate, the remaining parts being

of a normal female.

Fig. 3.

I. The first antennae of normal male and female

II. III. The first antennae of intersexes

It remains to be shown whether such sex intergrades are heritable or not.

Literature

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要 約

1. 異常個体の大多数は発生中の傷害に依るものと思われたので其等に就いては茲では省く事

として重複畸形と間性に就いて二三の例を報告する。

2. 重複畸形

A. 第 1 例 成体雌 (Fig. 1) 体の諸部分が種々の方向に重複したもので同一個体で行われた点に興味がある。

B. 第 2 例 成体雄 (Fig. 2) 第 2 脚外葉第 2 節の内側の棘が 2 本あるもの (正常は 1 本)。此の雄は近縁でない正常の雌を交配して F_2 に同一形質を見、遺傳する重複形質である事が明かとなつた。

3. 間性

本材料ではほとんど間性を見る事がないが、今迄に間性 2 個体を見た。

A. 第 1 例 (Fig. 3-II) 第 1 触角が雌雄中間の状態で他の部分は正常雌と同様であつた。1935 年海岸より採集したものの中におつたもの。

B. 第 2 例 (Fig. 3-III) 第 1 触角が中間で他は正常雌と同様。1941 年温度の実験中に現れたもの。

Chiyoko Tokunaga 1949. Genetic studies on *Aphiochaeta* sp. II. The genetic variability of truncate mutation. *Jap. Jour. Genet.* 24: 128~138 (With English résumé, p. 137~138)

ノミバエの遺傳學的研究

II. truncate の遺傳

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I. 緒 言

ノミバエ (*Aphiochaeta* sp.) で今迄に発見した突然変異体には不規則な遺傳をするものが多いが (徳永, 1949) その内の truncate (t) は 1943 年に野生型ストック中からの翅脈に異常のある 1 匹の雌と野生型雄との交配の F_1 中の頭部剛毛過剰で楯板剛毛を欠く 1 匹の雄に野生型雌 1 匹を交配して得た子供 78 匹中の雌 19, 雄 2 に出現した遺傳形質である。これは翅の第 2 縦脈と第 4 縦脈との間の翅縁が種々の程度に欠ける形質である。程度の低いものには正常と区別のつかぬものがある。又同一個体の右翅と左翅とで欠ける程度の異なる場合もあり程度の低いものには片翅が正常の場合もある。翅脈は大体は正常であるが Abrupt-low 様の場合もある。 t は野生型と交配すると稀に F_1 中に極少数の t を生ずるが F_2 は普通には正常で F_2 で生ずる t の数は全体の $1/4$ には達せずそれより低い浸透度を示す。 t 同志の交配でも若干の正常個体を生ずる。 t のストックは 50 代以上淘汰したが正常個体は除かれなかつた。即ち t は浸透度表現度共に不十分な形質である。 t の表現度を標準とし選択淘汰実験を行い稍々くわしく t の遺傳の状態を調査した。