CHROMOSOME NUMBERS IN GEOGRAPHIC POPULATIONS OF THE UTETHEISA ORNATRIX (ARCTIIDAE) COMPLEX AND CERTAIN HYBRIDS

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The Utetheisa ornatrix complex, of five geographic populations, varies in five striking characters of wing pattern and pigmentation. The purpose of this paper is to report the results of cytological examination of three of these subspecies and hybrids between them.

Chromosome complements of the Southern Continental form from Saint Thomas, V. I. (*U. o. ornatrix* L.), Puerto Rican from near Aguas Buenas, Puerto Rico (*U. o. stretchii* Butler) and Northern Continental from Lake Placid, Florida (*U. o. bella* L.) were examined together with laboratory hybrids of $\,^{\circ}$ Southern Continental $\times \,^{\circ}$ Northern Continental (Grand Bahama, B. W. I.) and the reciprocal cross.

Testes were removed from the dorsal region of the fifth abdominal segment in late instar male larvae by making an incision along the venter. Allen's P. F. A. -3 was used as the fixative. The gonads were embedded in paraffin, sectioned at 8 or 10 mu, stained with Heidenhain's Iron Hematoxylin, and counterstained with light green.

Slides were were examined under oil at a magnification of $2250 \times$. The drawings were made with camera lucida. Photographs were taken on 35mm panatomic X film at $300 \times$ and enlarged six diameters to give a total magnification of $1800 \times$.

1. Northern Continental population (*Utetheisa ornatrix bella*). N = 31. Counts were made in 73 nuclei (I) and 15 nuclei (II) from 4 male larvae raised from a stock collected at the Archbold Biological Station, Highlands Co. Florida. One nucleus (II) had n = 30.

2. Southern Continental populations (U. o. ornatrix). N = 31. Counts were made in 6 nuclei (I) from one male larva bred from a stock collected in Saint Thomas, Virgin Islands.

3. Puerto Rican population (U. o. stretchii). N = 31. Counts were made in 67 nuclei (I) and 9 nuclei (II) from 2 male larvae from stocks collected near Aguas Buenas, Puerto Rico. One of these nuclei (I) had n = 32.



Meiotic metaphase figures from sectioned, stained testes of the Utetheisa ornatrix complex. Figs. la, lb – No. Continental population (U. ornatrix bella – Florida, U. S. A.). Figs. 2a, 2b – same (II; n = 31). Figs. 3a, 3b – same (II; n = 30). Figs. 4a, 4b – Puerto Rican population (U. o. stretchii) (I; n = 31). Fig. 5a, 5b – F_1 hybrid of φ Southern Continental (U. o. ornatrix – St. Thomas, V. I.) $\times \Diamond$ No. Continental (U. o. bella – Grand Bahama, B.W.I.) (I; n = 31). Figs. 6a, 6b – same (II; n = 31). [I = primary spermatocyte division, II = secondary spermatocyte division; magnifications are 1800× in the photographs.]

4. Hybrid (F₁) between \Im So. Continental (Saint Thomas, V. I.) \times \Im No. Continental (Grand Bahama, B. W. I.). $N = \Im$. Counts were made in 74 nuclei (I) and 11 nuclei (II) from \Im male larvae reared in the laboratory. Four of these nuclei (I) had $n = \Im$.

5. Hybrid (F₁) between \Im No. Continental (Grand Bahama, B. W. I.) \times $\mathring{}$ So. Continental (Saint Thomas, V. I.). N = 31. Counts were made on 37 (I) nuclei and 9 nuclei (II) from 2 larvae bred in the laboratory. One of these nuclei (I) had n = 30.

The majority of primary and secondary spermatocyte metaphase figures in the three subspecies tested and the hybrids have 31 chromosomes. A single primary figure of the Puerto Rican population has 32 chromosomes. This may be explained as a single bivalent which separated at metaphase slightly before the rest. Of the total for the three populations and the hybrids there were five primary figures and two secondary figures with 30 chromosomes. Figures with both 30 and 31 chromosomes occur in the same specimen.

Aberrant chromosome numbers can be caused by non-pairing of chromosomes in hybrids. However, if the unusual figures resulted from non-pairing at primary metaphase, only increased numbers would be seen in the first division (I). Reductions in number would not be found until the second metaphase. Therefore, the unusual counts are not the result of failure of pairing in the first metaphase of hybrids.

It is concluded that the Northern Continental, Southern Continental, and Puerto Rican populations, and hybrids between the first two have a normal complement of n = 31 chromosomes. There is no evidence of chromosomal incompatibility in crosses between the most different phenotypically of the geographic subunits of the *U. ornatrix* complex, since hybrids between the Northern Continental and Southern Continental populations do not have increased numbers of chromosomes in the primary metaphase due to non-pairing of chromosomes or increased variation in chromosome number in the secondary metaphase due to difficulties in separation and movement to the poles.

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