Comment on: C. Koschnitzke, F. Kremer, L. Santo, P. Quick and A. Poglitsch, "A Non-Thermal Effect of Millimeter Wave Radiation on the Puffing of Giant Chromosomes" (Z. Naturforsch. 38 c, 883–886, 1983).

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Based on the data and the graphs given by the authors we have obtained quite different results, on which we want to report in the following.

The authors have examined certain giant chromosomes in isolated salivary glands of a midge in order to see whether they contain reduced Balbianirings of the type BR2. For this purpose they form the quotient

$$r = \frac{t}{m}, \tag{1}$$

m being the number of the counted rings BR2, and t being the number of those showing modifications. The paired salivary glands are submitted to different conditions, as a result of which the following quotients are obtained:

$$r\,(1) \quad \text{and} \quad r' \tag{2}$$

from which the equation

$$\Delta r = r - r' \tag{3}$$

is formed. (3) is the difference between two unlike fractions. Such a ratio estimator (lit. 1) is not an unbiased estimate, at least as far as sizes of samples < 50 are concerned. Parametric tests cannot be used. If a standard deviation is calculated (Table I of the authors) it will be biased.

Δr according to formula (3) can be positive (a) or negative (b). If ha and hb is the frequency of a and b, the null hypothesis is

$$ha = hb\,. \tag{4a}$$

A numerical estimate of $n < 50$ according to

$$\Delta r_1 + \Delta r_2 + \ldots \Delta r_i \tag{4b}$$

is not admissible for the reasons given above. Furthermore, no sample unit equal to 0 must be used, as it does not contribute to the decision whether

$$\bar{\Delta} r \gtrless 0\,.$$

Although the numerical result is not modified by the division of the zero values into $+0.5$ and -0.5 made by the authors, all of the predetermined safety limits are biased by an arbitrary enlargement of n. If negative values are not observed, the primary dates, too, are biased (tests IIIb, IIIc). The homogeneity of binominally distributed frequencies can be tested by various procedures. The most powerful test is the G-test of fit [2]. It is completely additive and resistant to low numbers of observations per class [3]. In all our tests, in which different methods were used (binominal confidence limits [4], Chi-square and G-test) the null hypothesis between the series I, II, IIIa was confirmed at level 0.05.

As a further test we have arranged random numbers (lit. 5) according to formula (3) ($n = 24$ as in series III of the authors). The result is not significant as compared to the irradiated (IIIa) and the non irradiated series I and II, whereas the deviations from a normal distribution were the same as those found in the test series.

Remain series IIIb with 10 and series IIIc with 12 usable results. Due to the absence of negative values they are significantly different from the others. If only the positive Δr of all series are compared, they are not significant. We think that the data obtained are not sufficient to allow final conclusions.

The irradiation of the isolated salivary glands during 2 h resulted in a rise of temperature of 0.3 °C. We are of the opinion that neither the conditions nor the results of the tests are suited to prove athermal biological effects of high-frequency electromagnetic fields [6]. Hence the applicability of the claimed results to living midges or homothermals is untenable.

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