The substance of this communication will be further discussed in separate papers dealing with its different aspects.

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Salinity Tolerance and *p*H Range of *Culex fatigans*

IN a paper on the biology of *Culex fatigans* Wied. in the Belgian Congo, Drs. Wanson and Nicolay[1] state that "at Banana the larval cycle is accomplished normally in concentrations of up to 30 grams of chloride per litre". Taking this figure as representing the total chlorides present, the salinity, (S°/$_{oo}$), expressed as total weight of salts in grams per 1000 gm. of sea water, would be in the vicinity of 33·5. Hamlyn-Harris[2] states that in Queensland this mosquito rarely breeds in brackish water. No other references to *Culex fatigans* Wied. breeding in saline waters have been found, and it is generally regarded as a typical freshwater mosquito.

In a recent series of experiments carried out at Sydney, laboratory cultures of *C. fatigans* were reared in various dilutions of sea water, using tap water as a control.

The general technique of breeding was similar to that previously described by me[3].

It was found that larvæ would not develop normally in water with a salinity greater than 10 gm. per 1000. Where the salinity was very gradually raised during larval development, about 60 per cent of adults emerged from S°/$_{oo}$ 11, about 15 per cent from S°/$_{oo}$ 12, and none from S°/$_{oo}$ 16. When first stage larvæ were transferred directly from S°/$_{oo}$ 0 to S°/$_{oo}$ 12, all died within a few days. Fourth stage larvæ transferred directly from S°/$_{oo}$ 0 to S°/$_{oo}$ 12 gave approximately 1 per cent of adults, and no adults emerged from large series transferred to S°/$_{oo}$ 13·5.

All control series gave 100 per cent adults. Pupæ, on the other hand, transferred from S°/$_{oo}$ 0 to S°/$_{oo}$ 70 gave 100 per cent adults, while from S°/$_{oo}$ 105, 85 per cent adults emerged. It will be seen from this that the pupæ are extremely resistant to high osmotic pressure in the surrounding medium.

With regard to the hydrogen ion concentration, the *p*H was lowered by the addition of dilute acetic acid to tap water, and it was found that 100 per cent of adults would develop from larvæ bred in water the *p*H range of which varied from 3·6 to 4·2. Similarly, by the addition of dilute sodium hydroxide, adults developed normally from larvæ kept in water which varied between *p*H 9·0 and 10·6. It may therefore be concluded that the hydrogen ion concentration in itself has no effect on the development *C. fatigans* within the limits of *p*H 4·2 and *p*H 9.

A detailed account of the experiments on salinity and hydrogen ion concentration will be published shortly.

In view of the importance of *C. fatigans* as a pest species and as a vector of disease, it would be interesting to know whether any other workers have records of it breeding in salt water. Possibly a salt water race of this species occurs on the coast of the Belgian Congo.

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Cytology of Metamorphosis in the Culicinæ

PROF. C. A. Berger[1] has apparently overlooked the work of Holt[2], who also investigated the larval gut of *Culex pipiens* during metamorphosis, and described multiple chromosome complexes of 9, 12, 18, 24, 36, 48 and 72 chromosomes. Holt's results do not agree with Berger's conclusion that there is a correlation between chromosome number and cell size in this case, and her illustrations show conclusively that any such correlation is fortuitous. Holt also describes the so-called 'prophase synapsis' of the sister chromosomes of the complex, which pair in three groups ($n = 3$), but she says that the cells with the largest multiples contain vacuoles and show signs of degeneration, and that these cells ultimately degenerate, and are absorbed by the newly formed imaginal cells.

Actually, this synapsis is somatic pairing[3], which was most strikingly shown in Diptera, and especially in *Culex*, by Metz[4], and was first found by Stevens[5]. It is due to attraction between homologous chromosomes, which results in close approximation, but any appearance of fusion is due, Metz showed, to faulty fixation. The chromosomes are not closely coiled round each other, and therefore those torsion stresses which are essential in the production of chromatid breakage and chiasma-formation[3] are not present, and reduction by the ordinary mechanism of meiosis is impossible. Holt believes that the close somatic pairing of the multiple chromosome complexes finishes before the end of prophase, and mitosis is normal. Even were it to persist to metaphase, it would not lead to regular reductional separation, as is demonstrated by the work of Ribbands[6] on the hybrid *Lilium* × *testaceum*, where position correlation of univalents at diakinesis usually leads to their parallel secondary pairing at prometaphase, but nevertheless the distribution of the univalents towards the opposite poles at full metaphase is random.

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