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The distribution of mosquitoes in Romania (Diptera: Culicidae). Part IV: Detailed maps for *Coquillettidia, Culiseta, Ochlerotatus, Orthopodomyia* and *Uranotaenia.*

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Abstract

Location maps are presented for the species of *Coquillettidia, Culiseta, Ochlerotatus, Orthopodomyia* and *Uranotaenia* recorded in Romania.

In two previous papers, the distributions of the mosquitoes of Romania were presented by ecological zone (Nicolescu *et al.*, 2002, 2003a). In this publication the exact locations of the records for the genera *Coquillettidia, Culiseta, Ochlerotatus, Orthopodomyia* and *Uranotaenia* are given, plotted using a Universal Transverse Mercator (U.T.M.) 10 square km grid system. Maps are not given for *Ochlerotatus behningi, Oc. zammitii* and *Oc. nigrinus* as the records are uncertain. Location maps for the genera *Anopheles, Aedes* and *Culex* are given by Nicolescu *et al.* (2003b).

References

Nicolescu, G., Vladimirescu, A. & Ciolpan, O. (2002) The distribution of mosquitoes in Romania (Diptera: Culicidae). Part I: *Anopheles, Aedes* and *Culex. European Mosquito Bulletin* **13**, 17-26.

Nicolescu, G., Vladimirescu, A. & Ciolpan, O. (2003a) The distribution of mosquitoes in Romania (Diptera: Culicidae). Part II: *Culiseta, Coquillettidia, Ochlerotatus, Orthopodomyia* and *Uranotaenia. European Mosquito Bulletin* **14**, 1-15.

Nicolescu, G., Vladimirescu, A. & Ciolpan, O. (2003b) The distribution of mosquitoes in Romania (Diptera: Culicidae). Part III: Detailed maps for *Anopheles, Aedes* and *Culex. European Mosquito Bulletin* **14**, 25-31.

List of figures:

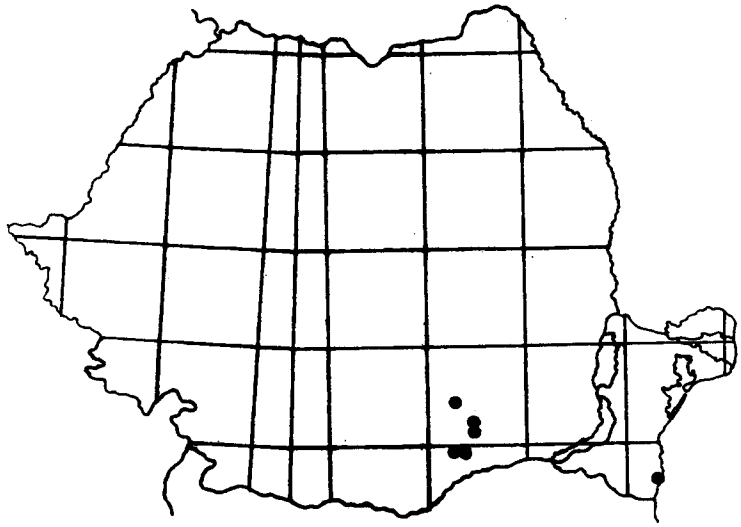

Figure 1

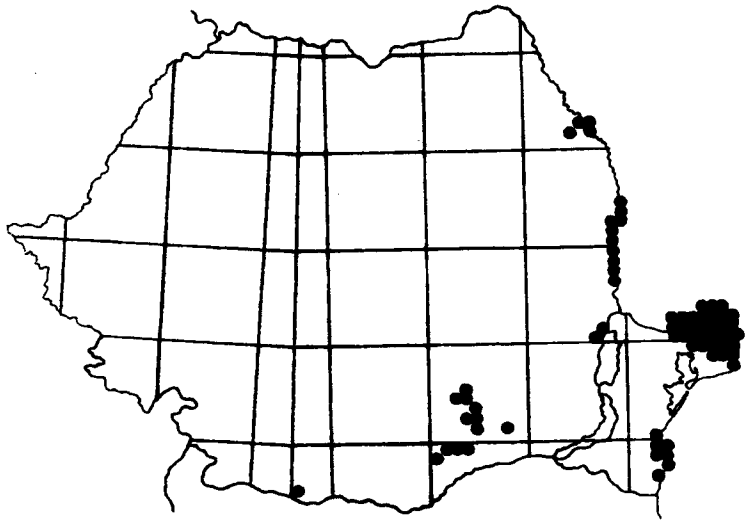

Figure 2

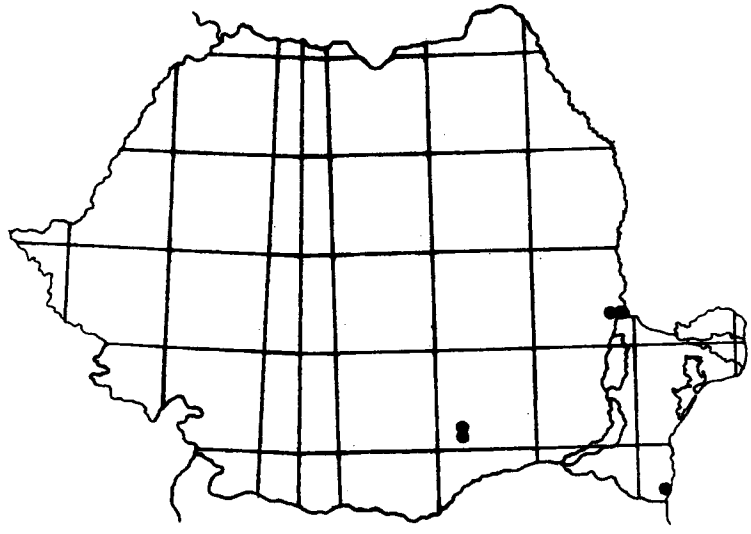

Figure 3

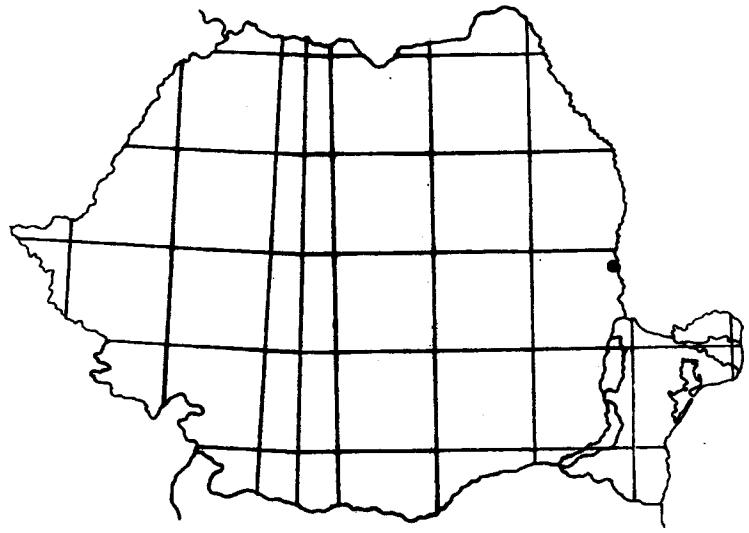

Figure 4

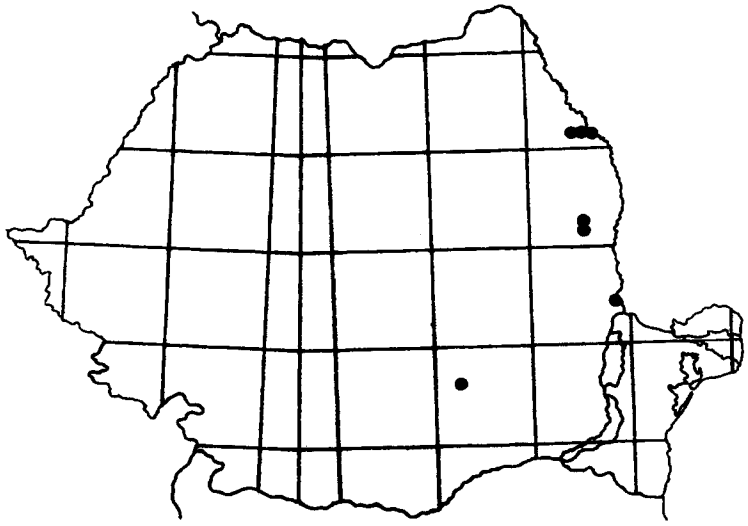

Figure 5

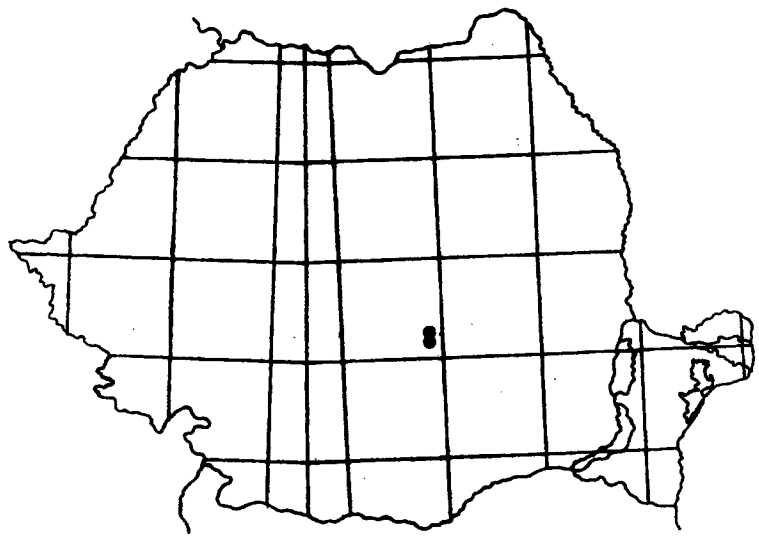

Figure 6

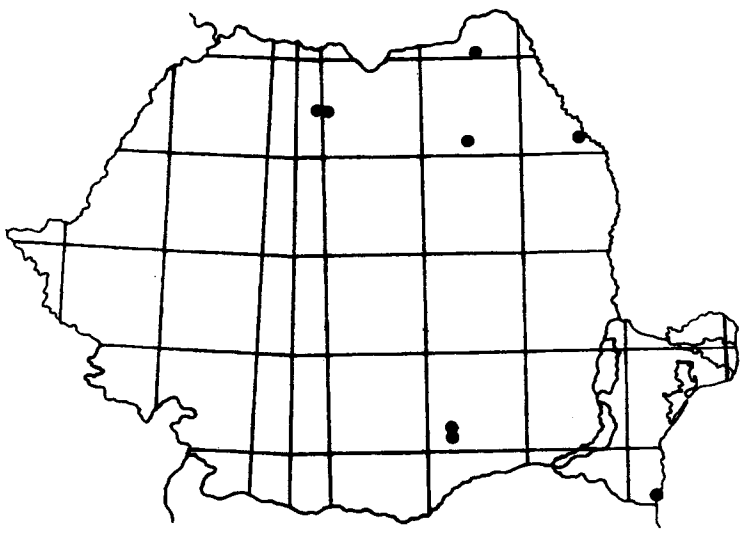

Figure 7

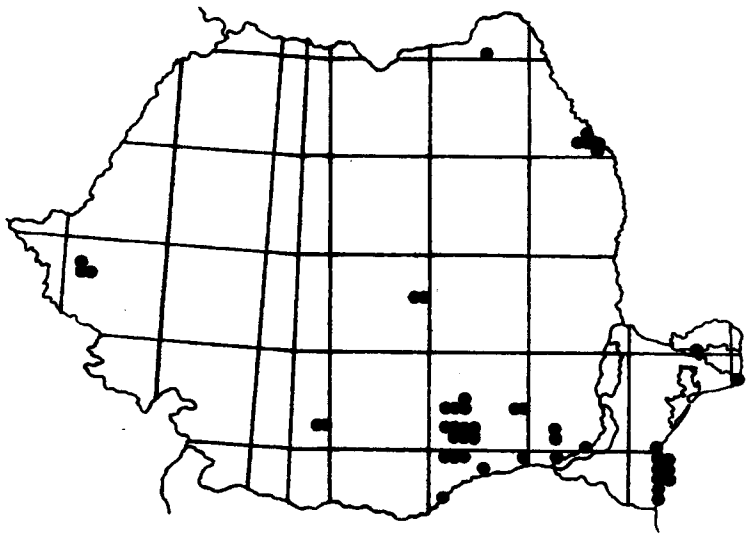

Figure 8

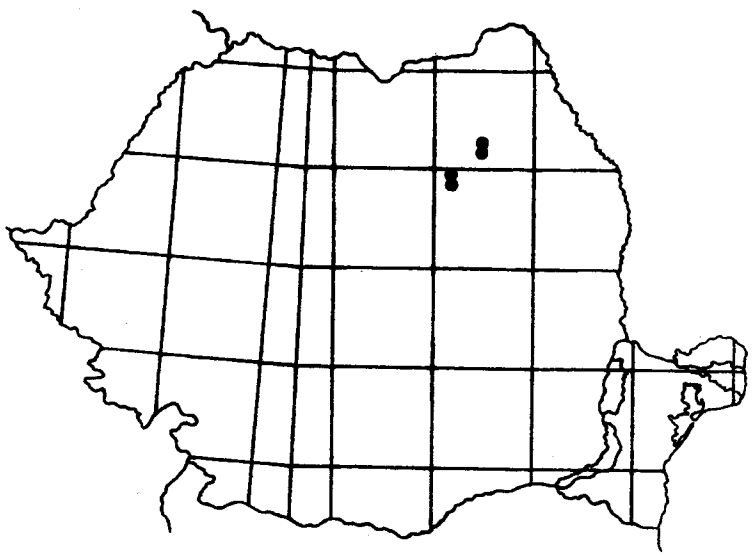

Figure 9

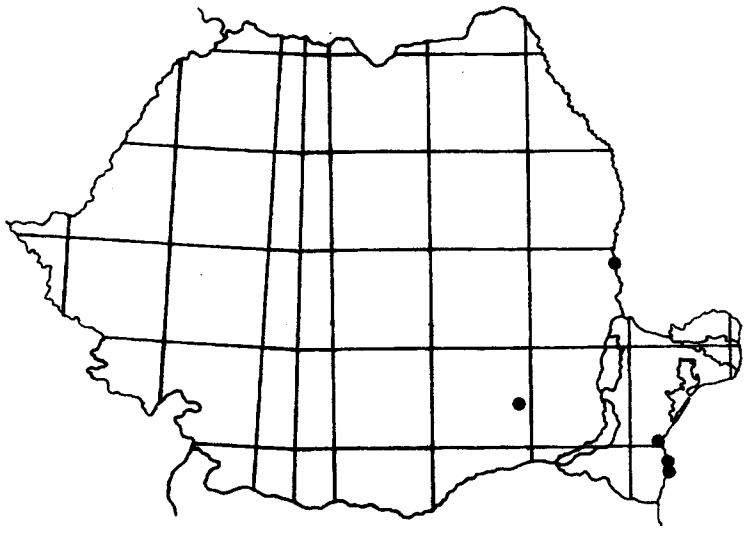

Figure 10

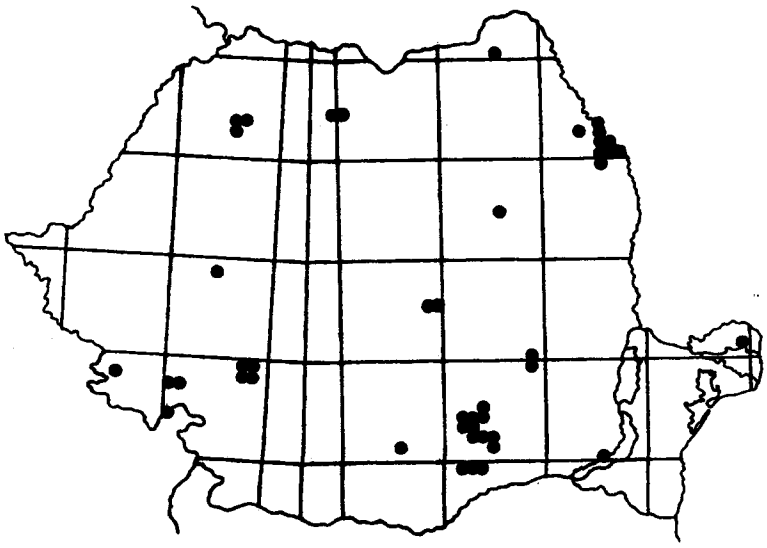

Figure 11

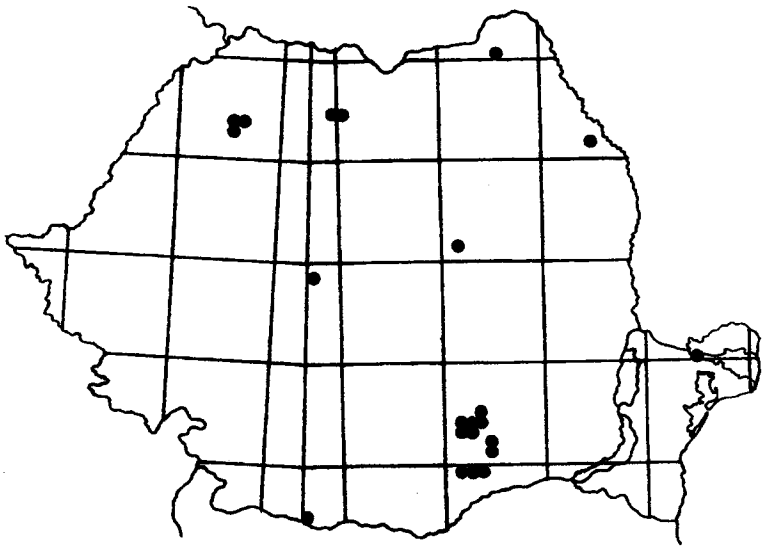

Figure 12

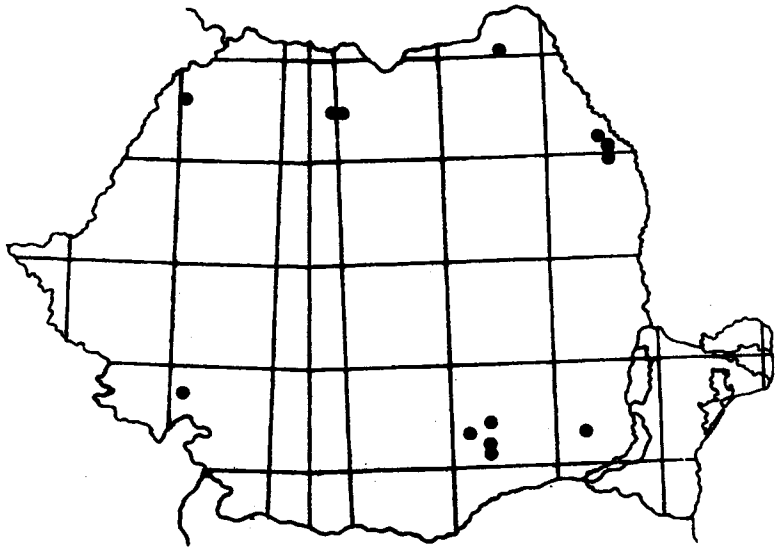

Figure 13

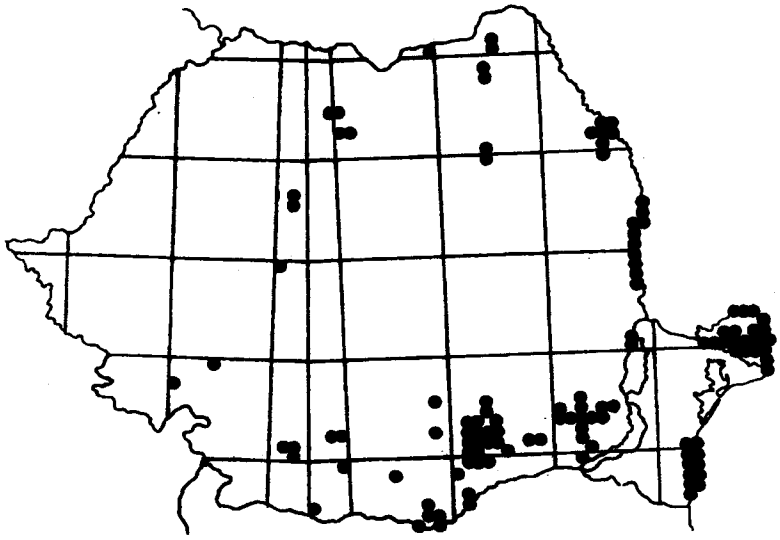

Figure 14

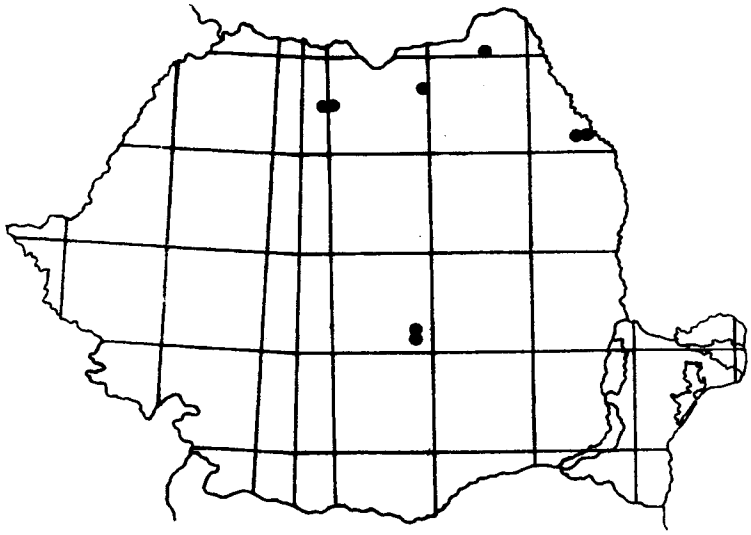

Figure 15

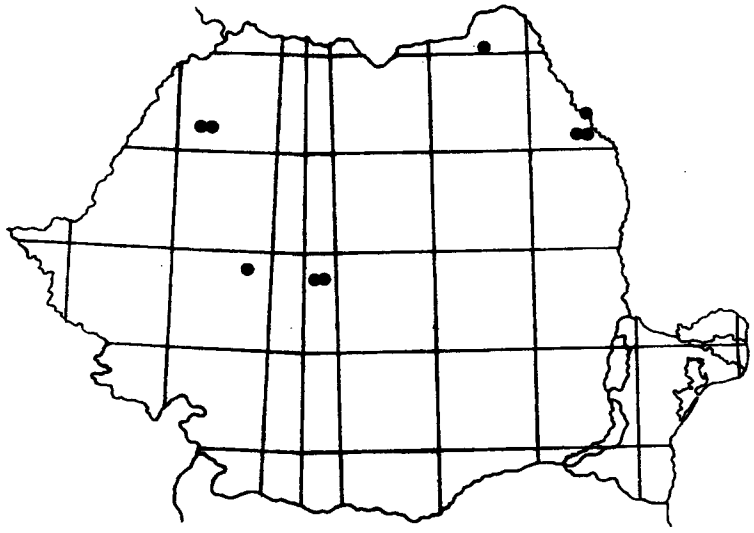

Figure 16

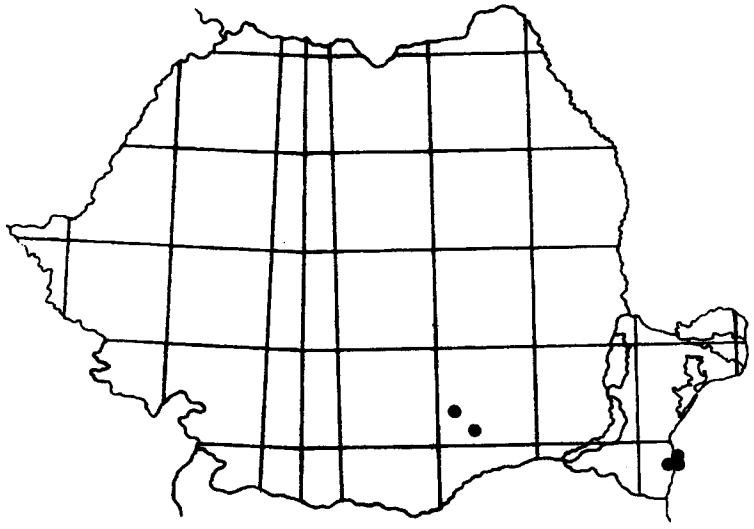

Figure 17

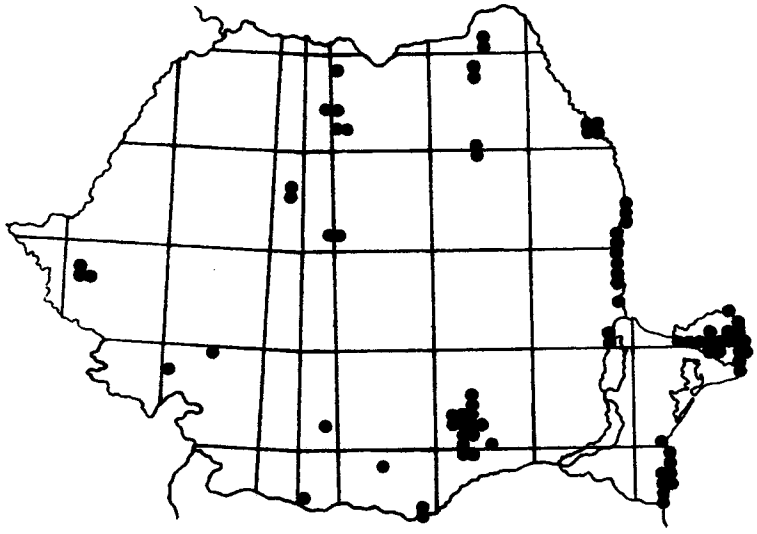

Figure 18

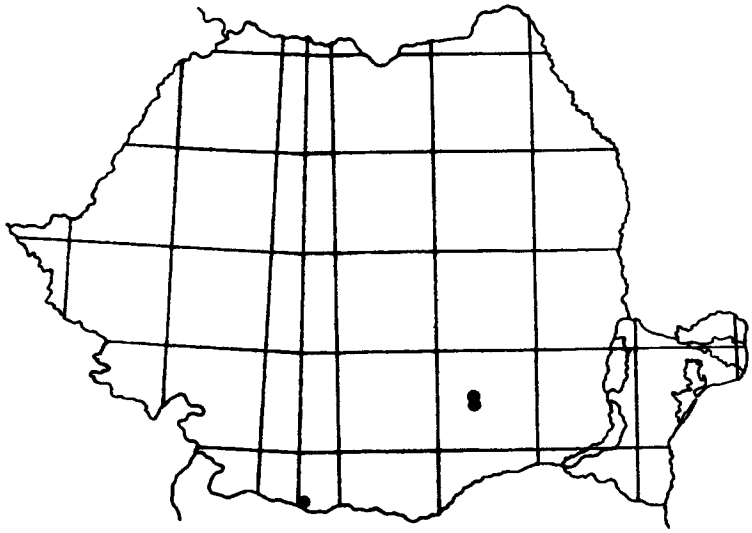

Figure 19

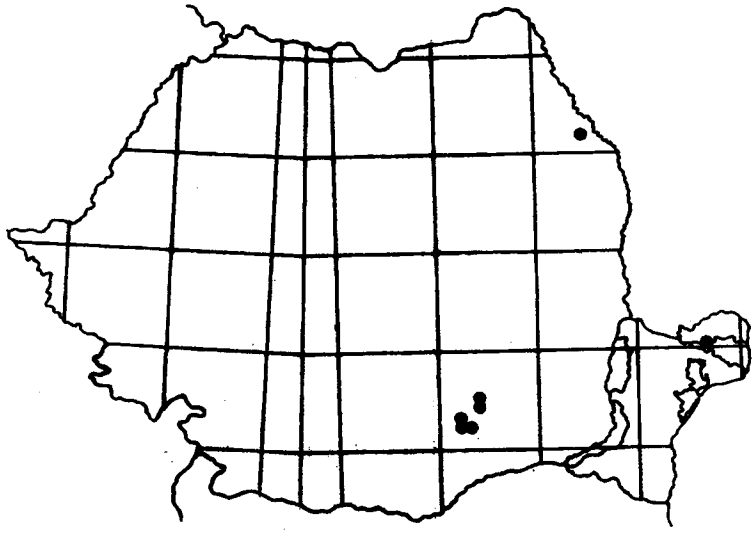

Figure 20

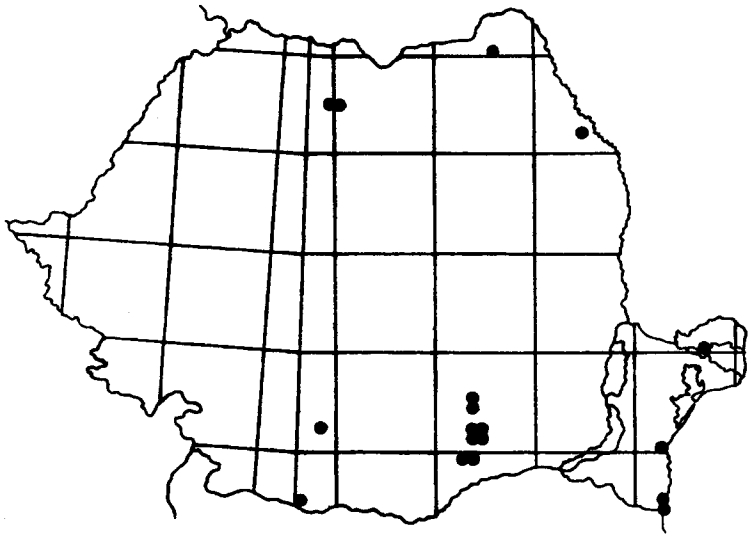

Figure 21

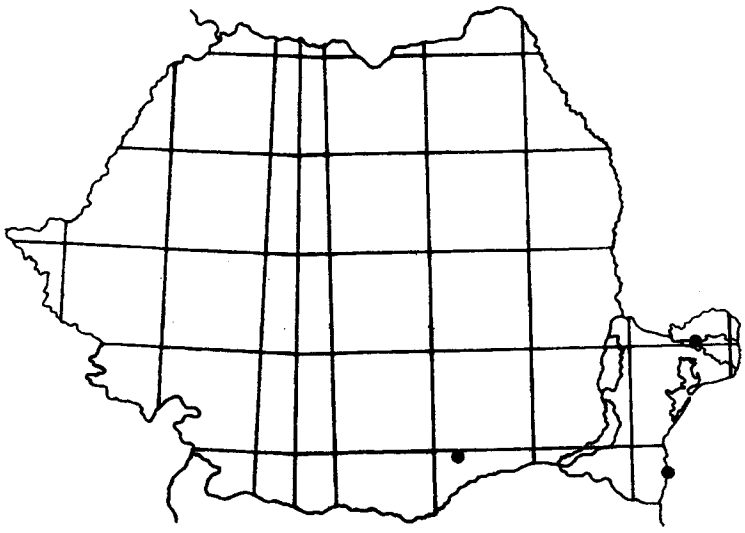

Figure 22

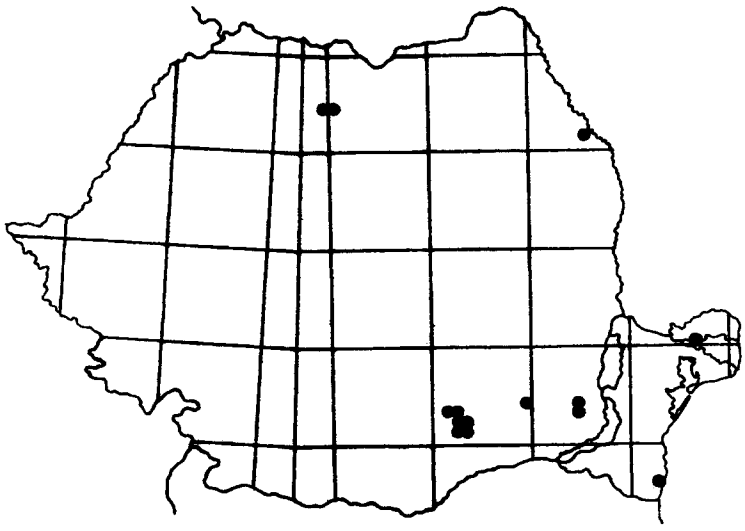

Figure 23

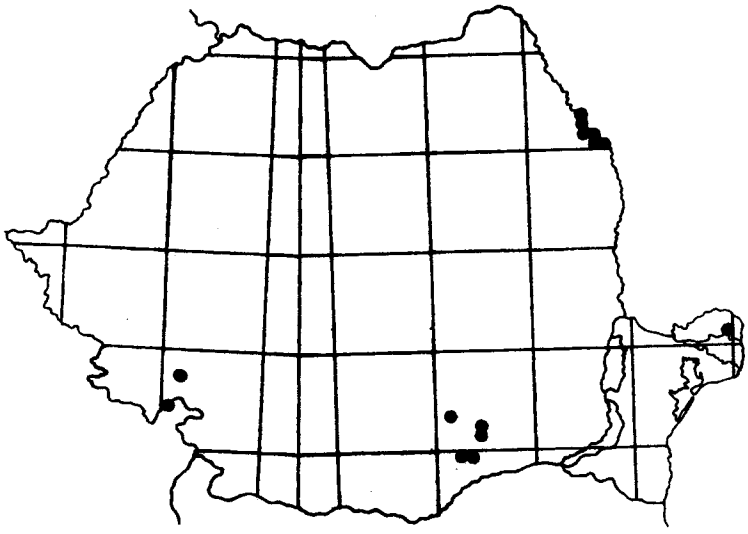

Figure 24

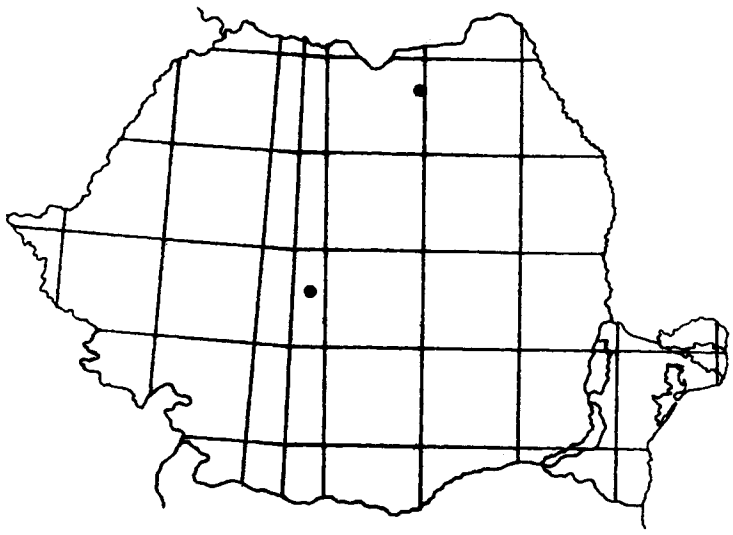

Figure 25

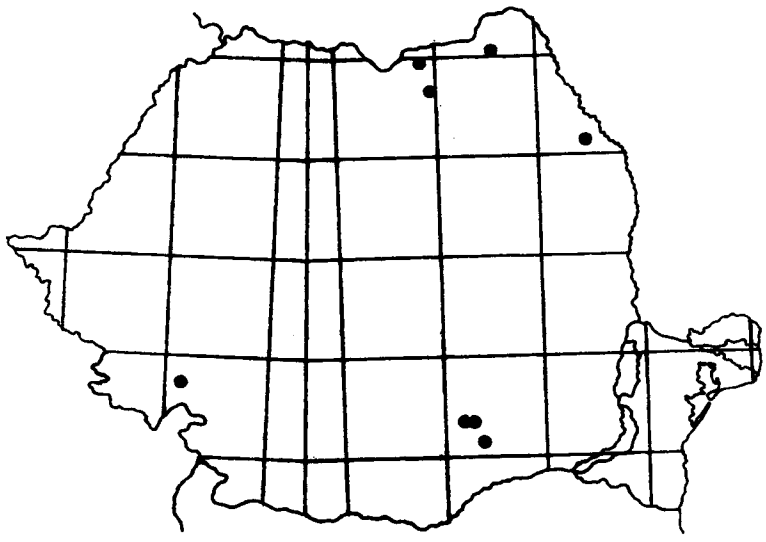

Figure 26

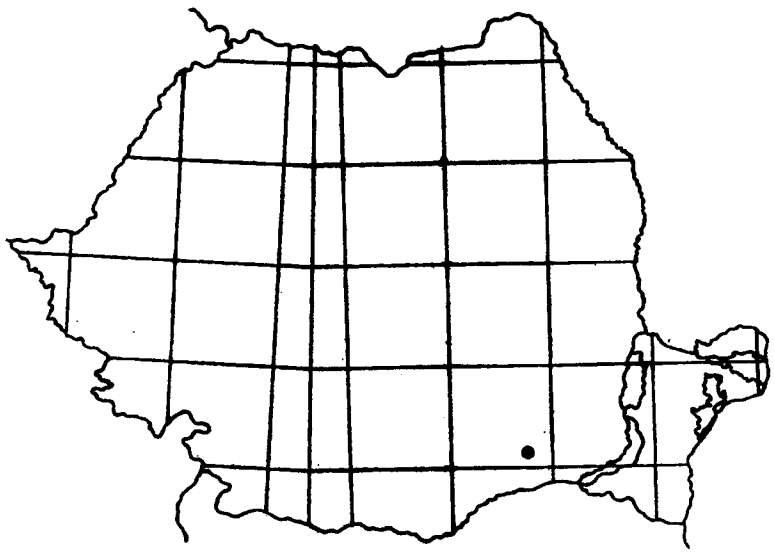

Figure 27

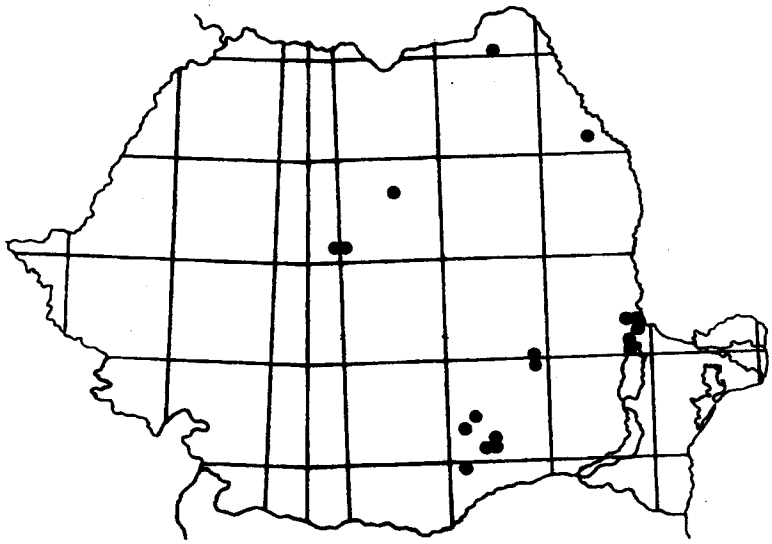

Figure 28

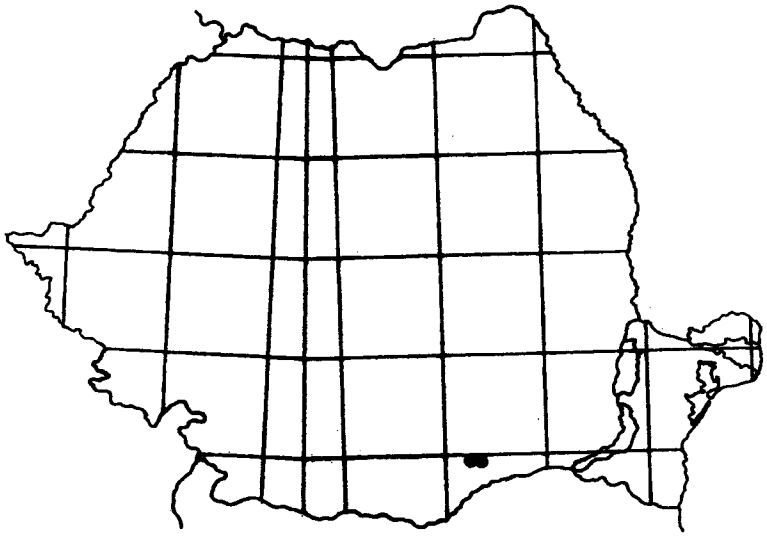

Figure 29

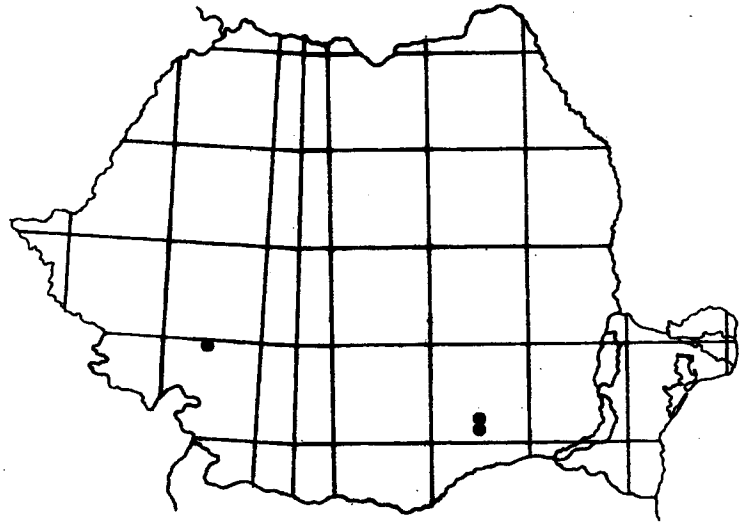

Figure 30

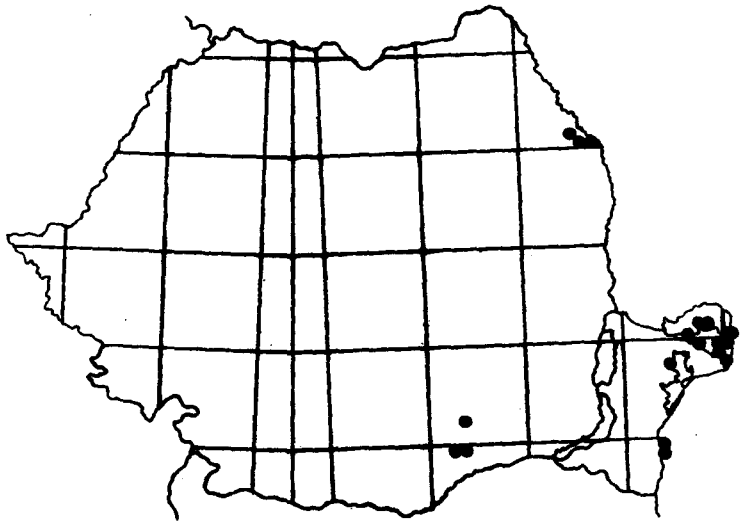

Figure 31

LETTER TO THE EDITOR

Sir,

In a recent article in the ***European Mosquito Bulletin*** Y-M. Linton, L. Smith & R.E. Harbach [13, 8-16 (2002)], provide evidence for the sympatric occurrence of adult female *Anopheles atroparvus* and *An. messeae* in a disused war fortification on the Isle of Grain, Kent, England, collected in the month of January. In winter, adults of *An. messeae* are known to hibernate, and the authors correctly state that at that time of year *An. atroparvus* is in a state of dormancy, while *An. messeae* is in complete diapause, not bloodfeeding between early autumn and spring. There are several points on which I wish to comment.

The authors nowhere mention the extensive work of Swellengrebel *et al.* on *An. atroparvus* and *An. messeae* in The Netherlands. Swellengrebel *et al.* published on the segregation of both species during the winter in animal stables (*An. atroparvus*) and uninhabited animal shelters (*An. messeae*) around Amsterdam in the province of North Holland (Swellengrebel *et al.*, 1928). Although there is a propensity of *An. atroparvus* to occur in stables, the data show that both species occurred in shelters, with *An. messeae* clearly being the dominant species.

The inference made to *An. messeae* as a vector of malaria in Russia is difficult to claim. Although *An. messeae* has frequently been inferred to be a vector of *Plasmodium vivax* in Sweden, Germany, Hungary and Russia, there are to my knowledge no published references where the parasite has been identified from adult mosquitoes.

Buck *et al.* (1932) demonstrated that *An. messeae* is susceptible to *Plasmodium vivax*, as is *An. atroparvus*, but the authors never found naturally infected *An. messeae* during many years of study in The Netherlands. Swellengrebel *et al.* (1929) report that this was because of the nearly exclusive zoophilic feeding behaviour of *An. messeae* during the summer and the non-feeding behaviour during autumn and winter. In The Netherlands *An. atroparvus* was the only vector, in spite of the co-existence of *An. messeae* in malaria indigenous areas (Torren, 1935). References to malaria transmission in Germany (Weyer, 1948) and Sweden (Ekblom, 1945) claim transmission by *An. messeae*, but *An. atroparvus* may have been the vector, as in the regions concerned the two species occurred in sympatry.

Should *An. messeae* have been the vector in Central and Eastern Europe, it must have had a different feeding behaviour or a different form of hibernation than *An. messeae* in England and The Netherlands. Our current studies on the behaviour of *An. messeae* (unpublished data) support Swellengrebel's previous statements of complete hibernation from September.

A final comment should be made on the role of *An. atroparvus* as a potential vector under conditions of predicted climate change in western Europe. We have recently shown that the proportion of *An. atroparvus* relative to that of *An. messeae* in the western part of The Netherlands has shifted dramatically in favour of the latter species (Takken *et al.*, 2002). We propose that a profound ecological change has occurred, which has made the circumstances for *An. atroparvus* significantly unfavourable compared to half a century ago. We postulate that the shift in construction of farmhouses, removing winter resting and feeding sites for *An. atroparvus*, may be the principal reason for this change. Populations of *An. messeae* are, as before, occurring in similar densities and ubiquitous, whereas those of *An. atroparvus* have diminished. We have not been able to establish a correlation between the salinity of the larval habitats and the occurrence of *An. atroparvus*, as was demonstrated by Swellengrebel & de Buck (1938). At present, *An. atroparvus* is capable of maintaining itself at low densities among populations of *An. messeae.*

References

Buck, A. de, Schoute, E. & Swellengrebel, N.H. (1932) Further investigations on the racial differentiation of *Anopheles maculipennis* in the Netherlands and its bearing on malaria. *Rivista di Malariologia* **11**, 137-156.

Ekblom, T. (1945) Les races suédoises de l'*Anopheles maculipennis* et leur role épidémiologique (dexième communication). *Bulletin de la Societé de Pathologie exotique* **31**, 647-655.

Swellengrebel, N.H., de Buck, A. & Schoute E. (1928) On anophelism without malaria in the vicinity of Amsterdam. *Proceedings KNAW* **31**, 531-539.

Swellengrebel, N.H., de Buck, A. & Schoute E. (1929) On anophelism without malaria around Amsterdam. (On the food of adult *Anopheles maculipennis* in malarious and non-malarious regions). *Proceedings KNAW* **32**, 772-779.

Swellengrebel, N.H. & De Buck, A. (1938) Malaria in the Netherlands. Scheltema & Holkema Ltd., Amsterdam, The Netherlands. 267 pp.

Takken, W., Geene, R., Adam, W., Jetten, T.H. & Velden, J. van der (2002) Distribution and dynamics of larval populations of *Anopheles messeae* and *An. atroparvus* in the province of South Holland, The Netherlands. *AMBIO* **31**, 212-218.

Torren, G. van der (1935) De zoogeografische verspreiding van *Anopheles maculipennis atroparvus* en *Anopheles maculipennis messeae* in westelijk Nederland met het oog op "species-assaineering". PhD thesis University of Amsterdam. 81 pp.

Weyer, F. (1948) Bemerkungen zur gegenwärtigen malarialage in Deutschland. *Aerztliche Wochenschrift* **3-4**, 56-59.

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Update on the names of European mosquitoes

I am grateful to Dr John Reinert for pointing out the omission of the subgenus *Fredwardsius* from the papers on the names of European mosquitoes published in this journal. Reinert (2000) compared *Aedes vittatus* with currently recognised subgenera and genera in the tribe Aedini and found that the species possesses unique and unusual features. He therefore established the new subgenus *Fredwardsius* within the genus *Aedes,* with *Ae. vittatus* as the type species. The subgenus is named after Frederick Edwards for his initial recognition of the distinctive features of *Ae. vittatus* and his outstanding work on the systematics of the Culicidae.

Frederick Wallace Edwards was born in 1888 in Peterborough, England and studied Natural Sciences at Cambridge. His distinguished career commenced in 1910 when he joined the Entomology Section of the British Museum (Natural History). He was in charge of Culicidae and was working at a time when there was an ever-growing interest in the group. He was an assiduous collector and made two major collecting expeditions to the Argentine and Chile in 1926 and to East Africa in 1934. He published on mosquitoes from home and abroad and on numerous other insect groups.

In the course of his career he described over 2000 new species and wrote more than 350 titles occupying some 6000 pages of print together with 2000 of his own drawings. His classic work "A revision of the mosquitos of the Palaearctic region" published in the *Bulletin of Entomological Research* in 1921 is a detailed 88-page paper in which he expertly reviewed and revised the mosquito fauna of Europe, North Africa and northern Asia through to Japan. The systematics of the Culicidae owes much to Edwards' lifetime of work. It was a loss to Science that Fred Edwards died prematurely at the early age of 51 in Letchworth, England in 1940.

Professor François Rodhain related three points to me. The first is that Georges Senevet told him that *Anopheles marteri* was named after his brother in law and not his wife, Marie Louise Marter (Snow, 1999). The original species description does not explain the dedication but the mosquito was discovered on a trip to the grave where Senevet's wife and other members of the Marter family were buried. The naming of the species after his brother in law explains the use of the masculine form *marteri* rather than the feminine *marterae*.

Professor Rodhain also remarks that in the summary (Snow, 2003) it should state that *Culex brumpti* was named after Emile Brumpt and not Alexandre Brumpt. In the more detailed account (Snow, 2001b), brief biographical details of Brumpt are given and, although he was known as Emile, his full name was Alexandre Joseph Emile Brumpt. However as he published as Emile, this name is more appropriate.

Finally François Rodhain has another proposal for the subgeneric name *Maillotia.* Theobald (1907), who named the subgenus, stated, "... its peculiar characters were noticed by Dr. Edmund Sergent, who suggested the name under which it is described". As discussed (Snow, 2001a), the vestiture of the head and thorax were seemingly sufficiently striking to warrant comparison with being "wrapped in swaddling clothes", derived from the French "maillot". Professor Rodhain suggests that the subgenus may have been named after François Maillot, a French military doctor involved in therapeutic malaria research in Algeria during the 19th century. This would explain the "-ia" suffix, which normally indicates derivation from a personal name. However, it would appear that Theobald was naming the subgenus after "its peculiar characters".

References

Snow, K. (1999) The names of European mosquitoes: Part 2. *European Mosquito Bulletin* **4**, 11-13.
Snow, K. (2001a) The names of European mosquitoes: Part 7. *European Mosquito Bulletin* **9**, 4-8.
Snow, K.R. (2001b) The names of European mosquitoes: Part 9. *European Mosquito Bulletin* **11**, 27-30.
Snow, K.R. (2003) A summary of the names of European mosquitoes. *European Mosquito Bulletin* **14**, 16-20.
Theobald F.V. (1907) A monograph of the Culicidae or mosquitoes. Volume 4. xix+639pp. London. British Museum (Natural History).

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