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***Metrioptera (Roeseliana) roeseli* (Hagenbach, 1822) f.  
*diluta* (Charpentier, 1825) in the Montreal Area  
(Orthoptera: Tettigoniidae)**

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A few years ago, Urquhart and Beaudry (1953) published the first North American records of *Metrioptera (Roeseliana) roeseli* (Hagen.) which had been discovered near the Montreal airports in July, 1952 (Ville St. Laurent, 12.VII.-1952, 3 ♂) (Professor Beaudry (in litt., 1960) actually cites 4 ♂); Montreal, 16.VII.1952, 1 ♂; 19.VII.1952, 1 ♂). It was suggested that the species had been introduced by aircraft at some previous date. Subsequently Professor Beaudry (in litt., 1960) has taken the species in suitable grassy localities at several points on Montreal Island (Montreal, 7.VII.1953, 1 ♂; Ste Geneviève, 15.VII.1953; Mount Royal, 9.VII.1959, 1 ♂;) and the neighbouring islands of Ile Perrot (1.VII.1953, 7 ♂, 1 ♀; 3.VII.1953, 1 ♂, 3 ♀) and Ile Jesus (St. Martin, Laval Co., 7.VII.1953, 1 ♂)<sup>2</sup>. He has also encountered it subsequently all around Montreal; at Bois-des-Filion (just on the mainland north of Ile Jesus) it was "very common" during the summer of 1960.

In addition to the specimens recorded by Prof. Beaudry, two males were collected at Rougemont (on the southern Quebec mainland, about 25 miles in a direct line east of Montreal) by the entomological staff of the Canada Department of Agriculture Research Laboratories at St. Johns, Quebec (30.VI.1954 and 6.VI.1955). Dr. E. J. LeRoux (personal communication) also indicates that the species was common at Rougemont during the summer of 1960.

The records would therefore suggest that *M. roeseli* was indeed extending its range, as predicted by Urquhart and Beaudry (*l. c.*), and that it was doing so quite rapidly—unless, at the time of its discovery, it was already more widely distributed than was supposed. It is interesting to note, however, that the military aerodrome of St. Hubert is not very remote from Rougemont and could also have acted as a point of introduction, but it is also interesting to observe that the Rougemont specimens taken in 1954 and 1955 were both fully macropterous (f. *diluta* (Charp.)), and might have flown thither from some other focus—the Ste Geneviève and Mount Royal individuals recorded by Beaudry were also macropterous.

Apart from the four mentioned above, all the specimens of *M. roeseli* so far taken in Quebec have been of the typical brachypterous form commonly encountered in Europe, and hitherto there has been no published record of the macropterous f. *diluta* in North America. During July, 1960, however, numerous fully macropterous specimens were collected among fairly short grass on the Macdonald College campus, Ste. Anne de Bellevue (opposite Ile Perrot, at the extreme western end of Montreal Island), where the species had previously been unrecorded. In fact all the material collected, with but one exception, was of this form. Mr. L. Jobin collected large numbers of specimens, the majority of which were kept in captivity but, unfortunately, did not survive. The data for specimens actually preserved are as follows:—10-12.VII, 4 ♂, 3 ♀ (*L. Jobin*); 13.VII, 1 ♀ (*D. K. McE. Kevan*); 14.VII, 1 ♀ (*S. M. Kevan*); 15.VII, 1 ♂ (brachypterous), 1 ♀ (*M. K. Kevan*); VII. 1960, 7 ♂ (*M. K. and S. M. Kevan*), 2 ♀ (*B. Cooke*).

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<sup>2</sup>The following specimens are also in the Department of Agriculture, Quebec: Ile Perrot, Cté. Vaudreuil, 1.VII.1953, 1 ♀; Montreal, 8.VII.1953, 1 ♀ (both *J. R. Beaudry et F. Godbou*).

On 18th July, also, a widely publicized "invasion" of central Montreal City by grasshoppers, reported in newspapers as far afield as Nova Scotia, occurred (see, for example, Anonymous, 1960). The species involved in this "invasion", were, as is often the case with such incidents, mixed (although most of the grasshoppers collected were *Melanoplus bivittatus*), but one sample contained two macropterous specimens of *Metrioptera roeseli* ( $\delta$ ,  $\text{♀}$ , 20.VII.1960, B. Cooke)!

It thus seems desirable to record these unusual occurrences of the macropterous form: unusual, not only because *f.diluta* has not hitherto been noted from North America, but also because it is by no means common in Europe. According to Zeuner (1941) the macropterous form of *M. roeseli* occurs throughout the Old World range of the species (Spain, France and England, eastwards to Central, East and Southeast Europe as far as the southern Urals and beyond into western Siberia)<sup>3</sup>, but he states that it is rare. In some years, however, it may be locally plentiful, or at least not uncommon (Ramme, 1931; Ebner, 1951; Harz, 1957), and in France, although it is said to be rather rare, it has been recorded from a large number of localities (Chopard, 1951). The present records are of further interest because the macropterous form predominated, a search for brachypterous specimens resulting in but a single capture. In Europe, such an occurrence is, so far as I am aware, unknown, even when *f.diluta* is plentiful (*cf.* Ramme; Ebner, *ll.cc.*).

Ramme (1931; 1951) is of the opinion that cool soil conditions and a humid environment are favourable for the development of the macropterous form and that those found under drier conditions are probably immigrants. Ebner (*l.c.*) agrees that macropterous forms are associated with a moist environment. Conditions at Ste. Anne de Bellevue during the spring and early summer of 1960 were, however, not unusually cool or damp; not does it seem probable, although the Macdonald College campus does not present a particularly moist environment, that the specimens were immigrants, since the macropterous form was found for the first time almost simultaneously with the brachypterous one. That macropterous individuals do migrate is suggested by their appearance in central Montreal. Ramme (*ll.cc.*) notes that specimens which he considered to have migrated often had damaged wings, although Ebner (*l.c.*) is of the opinion that the wings become damaged merely because their unusual length makes them unwieldy. The Montreal male was very battered and some of the Ste. Anne's specimens were also damaged, but the majority were not.

The occurrence of large numbers of the macropterous form, which may perhaps be regarded as a dispersal phase, may conceivably help *M. roeseli* eventually to "extend its range over much of the eastern United States and Canada," as predicted by Urquhart and Beaudry (*l.c.*), but this remains to be seen. Before accepting such an hypothesis it should be noted that Ramme (*ll.cc.*) found that macropterous specimens of *M. roeseli*, taken at Falkensee in Germany, where they were numerous in July, 1930, had greatly reduced and partially sterile gonads, so that some doubt was cast upon the effectiveness of macropterous individuals in establishing the species in other areas. Chopard (*l.c.*), while not disputing Ramme's evidence, points out that any generalization regarding this matter in respect of macropterous *Metrioptera* as a whole required verification. In fact, when two macropterous females of *M. roeseli* from Ste. Anne's were dissected<sup>4</sup>, they were found to have well developed ovaries full of eggs. Unfortunately it was not possible to examine males or other females, but this

<sup>3</sup>Although Zeuner does not say so, *M. roeseli* is also found as far north as Denmark, but it occurs only in southeast England.

<sup>4</sup>One by Mr. V. R. Vickery whose assistance is gratefully acknowledged.

would suggest that in eastern Canada, at least, *f. diluta* could prove to be effectual in establishing the species further afield.

It is also interesting to record a late occurrence of the species for Montreal Island. Mr. V. R. Vickery collected a very undersized, very brachypterous female in a grassy field on the edge of Senneville woods, near Ste. Anne de Bellevue, on October 1, 1960. This indicates that, in Canada, the seasonal occurrence of *M. roeseli* is similar to that in Central Europe, namely from early July until the beginning of October (cf. Harz, 1957; 1960). The most recent study of the biology of this species is that of Cejchan (1960).

This recent, successful introduction of a European decticine into North America is not unique. Strohecker (1955) records the occurrence of a rather close, macropterous relative of *M. roeseli*, *Platycleis (Tessellana) tessellata* (Charp.) in California. This species (possibly brought in with nursery stock) has become established and is extending its range (Harper and Lockwood, 1960). Another recently introduced tettigonioid from Europe is *Meconema thalassinum* (DeGeer) (Meconematidae), which has been found on Long Island (A. B. Gurney *in litt.*, 1959; *in press*); this could doubtless survive in eastern Canada if the opportunity presented itself.

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