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SUMMARY :

Assembling all available material and information on the hoverflies taken in Belgium and the Grand-Duchy of Luxembourg yielded over 67000 records, about one fifth of them obtained by means of Malaise traps. These data, although rather unevenly spread in space and time, will allow to compile a first survey of the faunistics of the Syrphidae of this region.

An up-to-date check-list names 314 species, including some of doubtful status. About 25 species are feared to be (virtually) extinct or seriously threatened, at least in part of their range here. Two others, Helophilus hybridus and Platycheirus ovalis, have probably arrived here only in recent times.

The occurrence of each species has been put in map; a number of characteristic distribution patterns can be recognised. More than 50 % of the species were found to be rare and/or quite local; some may only be occasional strays. Flight periods are listed in detail so that the number of generations can often be deduced. In the course of the year the Syrphid fauna as a whole shows two periods of peak activity and a slump in early summer.

An evaluation method is proposed so that conservationists may evaluate and compare the results of local surveys.

SAMENVATTING :

Dit eerste en voorlopige overzicht van de faunistiek van de zweefvliegen in België en het Groothertogdom Luxemburg is gebaseerd op meer dan 67000 gegevens; zowat één vijfde hiervan is afkomstig van een recente inventarisatie met behulp van Malaisevallen. Hoewel ongelijk gespreid in ruimte en tijd lijken deze gegevens toch voldoende representatief.

De Belgische zweefvliegenfauna omvat 314 soorten, waaronder enkele van twijfelachtige status. Circa 25 soorten lijken sterk bedreigd, ten minste in een deel van hun areaal hier; sommige er van zijn intussen (virtueel) verdwenen. Anderzijds wordt vermoed dat Platycheirus ovalis en Helophilus hybridus recente aanwinsten zijn voor onze fauna.

Het voorkomen van elke soort wordt in kaart gebracht; hierbij kan men verschillende typische verspreidingspatronen onderscheiden. Van iedere soort worden niet enkel de uiterste vangstdata opgegeven, maar ook het aantalsverloop daartussen. Zodoende kan men voor de talrijkst voorkomende soorten het aantal generaties afleiden. Aangetoond wordt dat de zweefvliegenfauna in zijn geheel beschouwd in de loop van het seizoen twee aktiviteitspieken vertoont, gescheiden door een inzinking in het begin van de zomer.

Om inventarisaties van de zweefvliegenpopulaties van diverse natuurgebieden onderling te kunnen vergelijken en waarderen wordt een evaluatiemethode voorgesteld, gebaseerd op het aantal positieve U.T.M.-hokken.

I. GENERAL PART

1. INTRODUCTION

1.1. THE GENERAL CONTEXT : THE NEED FOR A MORE COMPREHENSIVE KNOWLEDGE OF OUR NATIVE ENTOMOFAUNA FOR CONSERVATION PURPOSES.

The technological revolution, especially in agriculture, has resulted in a serious degradation of our environment: a statement that has already become commonplace. This degradation, which may already have set in during the closing years of last century, has acquired alarming proportions particularly since 1950, and is still gathering momentum. Some re-thinking has been done and some timid countermeasures taken. On the whole, however, the process is going on almost unchecked, and may in many respects have become irreversible.

The growing awareness that irreplaceable riches were being sacrificed for the sake of dubious gains, and the fear of an impending ecological catastrophe of universal dimensions have not been able to reverse this trend. What they did bring about, however, was a greatly revived interest in our native natural heritage. The local fauna and flora had been inventoried assiduously, chiefly from the middle of last century until the beginning of this century. Then it flagged. Research shifted to other fields and few professionals or even amateurs continued the work of the former generations of naturalists.

One of the results of this neglect is a lack of detailed information, which became a serious handicap when the conservationist movement grew and demanded that effective measures be taken. No one could even tell exactly which species were threatened or had become almost extinct. Yet, before conservation laws could be drawn up or the right management plans for nature reserves could be devised, it was necessary to have a clear picture of the actual status of our native species. Extensive and comprehensive surveys were needed, and they were needed urgently.

It is obvious that even in a small country like Belgium such surveys could not be tackled by the handful of professional biologists that might be detailed for such time-consuming tasks. A great number of dedicated and experienced field workers would be needed in order to cover as much of the territory as possible. In some cases the organisation of detailed and reliable surveys did not take much time. Some florists and ornithologists had shown foresight and had gone on collecting information : this only had to be assembled and ordered. Presently atlases could be published that reflected the situation, both in the present and the recent past.

In other fields prospects were (and to some extent still are) far less promising. To undertake a comparable survey of the invertebrate fauna is a daunting task. The problems are obvious. The infinitely greater number of species, their small size, the elusiveness of many because of their hidden existence and inconspicuous behaviour, the short life of many adult insects, the fluctuating numbers, etc. make even the mere collecting of data far more difficult than is generally appreciated. Unsolved taxonomical problems, the lack of specialists in many fields also complicate matters in no small degree.

And most serious at all : whereas florists and ornithologists had at least a general idea of the situation, entomologists were much worse off. In this country, as almost everywhere else, the amount of faunistic information that was available in the literature was negligible. Apart from some species lists for a limited number of localities, almost nothing was known about the frequency and range of even the commonest species. To appreciate the extent of this ignorance one needs only to consult current identification handbooks : except for some very recent ones they are unbelievably vague on this subject.

Even so a start was made, and since the launching of the E.I.S. (European Invertebrate Survey), a project in which this country plays an important role, considerable progress has been made. So far the Belgian headquarters of the E.I.S., the Faculté des Sciences Agronomiques de l'Etat at Gembloux (in future to be referred to as "Gembloux") have printed over 2000 maps in the series "Atlas Provisoire des Insectes de Belgique ..." A gigantic card index contains a mass of unpublished information, which is currently being computerised. In recent years the Royal Institute for Natural Sciences of Belgium (Brussels) and the biology faculties of some of our universities have taken up similar surveys : the present paper makes part of this project.

1.2. THE SPECIFIC CONTEXT : WHY A SURVEY OF THE FAUNISTICS OF BELGIAN SYRPHIDAE ?

So far much of the work referred to has been done on the subject of macro-Lepidoptera, Coleoptera, Odonata, the larger Hymenoptera. It is understandable that these groups were selected : these are indeed the insects which have long been attractive to the great majority of entomologists, both professional and amateur. There is a considerable amount of material, preserved in collections ; much of the literature concerns them.

For many reasons (which are often quite justified !) the order of Diptera has largely been neglected by naturalists. This is unfortunate, as flies are ecologically very important and in many sites make up the bulk of the insect biomass. The number of species is considerable, probably more than 6000 ! It says "probably", because it is not even approximately known. The figure of 6000 has been put forward in analogy with the fauna of the British Isles, which is roughly comparable and has been studied far more comprehensively. In fact, the number of Diptera identified so far in this country is much smaller. According to P.GROOTAERT (pers.comm.) less than half our dipteran fauna is known at present.

Fortunately hoverflies have found greater favour with collectors than most other dipteran families. For the moment there is a relatively widespread interest in these attractive flies, though not yet on a scale like in NL. Thanks to Dutch workers in this field, and especially V.S. VAN DER GOOT, we dispose of excellent identification keys, which has certainly stimulated some to take up the study of hoverflies over here.

We dispose therefore of far more material and information than is available about other Diptera. We were able to gather more than 67000 records on the 314 species identified in this country so far. This is felt to be sufficient for a first (provisional) survey. It is hoped that this publication will stimulate naturalists to continue or take up the study of hoverflies. It will only be possible to compile a more complete and more precise faunistic survey with their collaboration. Many parts of the country have not yet been thoroughly sampled, and the frequency and range of the less common species are still poorly known.

As most hoverflies, and particularly the rarer ones, are more or less narrowly linked to certain types of habitat, their future lot here depends on the conservation (not only protection, but also management) of these biotopes, many of which(salt marshes, humid heathland, bogs,...) are already greatly reduced in size and scope. It is true that at least some Syrphidae seem capable of survival and procreation in sites of quite reduced size ; some species are highly mobile, too, which enables them to colonise suitable habitats within a short time and possibly at great distance. What we do not know is whether they all possess this quality.

The prospects for the immediate future are not bright. Some types of habitat are already lost, others only just survive and are in urgent need of protection and suitable management. This has already resulted in the extinction of half a dozen hoverfly species, some twenty others appear to be threatened in at least part of their range here. The presence of certain hoverflies in a nature reserve or another site is highly significant and should be taken into account. In fact the hoverfly fauna of a site should count in the evaluation of this site. For this purpose an evaluation system has been devised.

Conservation was indeed the main purpose of the present study. Up to now the entomofauna of a site has hardly played a part in its designation as a protected area. The breeding of rare birds, the presence of rare plants or mammals or even butterflies may convince the authorities of the necessity to protect a site. We do not believe they will ever be impressed by the presence of some rare flies. Nor do we believe that foresters will adapt their management in order to give better chances to those hoverfly species that feed on rotting and mouldering wood or the sap exuding from tree wounds. It would not be unrealistic to expect curators and members of management committees of our nature reserves to consider the needs of the insect population in their planning.

Apart from conservation the present paper may have some purely scientific interest, too, even for Syrphidae specialists abroad. There are now quite a few local surveys, but this is only the second time the hoverfly fauna of an entire country (albeit a small one) is treated comprehensively. Our only predecessor was TORP PEDERSEN, who published the distribution maps of Danish Syrphidae (1984). More countries will follow and the use of the same cartographic system will facilitate comparison.

Each species is not only represented by a distribution map ; phenological and ecological data are also given in detail. It is not surprising to find that the flight period of the same species may differ considerably from country to country. Apparently some hoverflies develop a different number of broods according to the climate of the region they live in ; even within the territory of this small country there are regional differences. However, not all species are affected in the same degree ; some seem to be hardly affected at all. In a few species there seem to be differences even in the matter of habitat links. It is not unrealistic to foresee that in a not too distant future faunistic surveys will be available from all western Europe, ranging from northern Spain to Norway. Seen in this prospect the present study will be a useful addition to the general knowledge about Palaearctic Syrphid fauna.

2. THE HISTORICAL CONTEXT

Collecting hoverflies in this country started around 1870 ; at any rate the oldest specimens in the I.R.S.N.B. collection date back to that period. It has been going on ever since, but until recent times it went in a rather spasmodic way. There were peaks of activity around the turn of the century, from 1918 till 1922, between 1936 and 1950, but in between attention slackened. Some dipterists (M. GOETGHEBUER, M. BEQUAERT) were active over a very long period, collecting hoverflies on and off from 1910 till the late fifties, and J. VERBEKE built up a fine collection from 1940 till 1972. These three have made a thorough exploration of the neighbourhood of Gent, but also in many parts of the Ardennes. From 1930 on entomologists from Liège were active in their province : MARECHAL, A. COLLART, later also M. LECLERCQ.

Though we can study a fair amount of historical material thanks to the efforts of those people as well as many others (E. L. COUCKE, J.C. JACOBS, A. GUILLAUME, E. CANDEZE, later also G. SEVERIN, A. TONNOIR, G. MARLIER, etc.) few of them had a particular interest in Syrphidae ; most of them collected Diptera in general, some of them had an even wider interest.

The first survey of Belgian Syrphidae was published by J.C. JACOBS in 1901. It was based mainly on his own collecting (1880 - 1900). His species list was revised by another medical man, M. LECLERCQ, in 1955; some dubious species were deleted and a considerable number of others were added. The 1955 check-list was based almost entirely on the literature. As the author himself surmised it was far from complete ; the I.R.S.N.B. collections contained many more species, which had been correctly identified but never published. M. LECLERCQ then planned a systematical revision of the available material and published a number of papers on Syrphid genera (Microdon, Sericomyia, Chrysotoxum, Xylota) in the following years. Unfortunately he then abandoned the project.

During the 25 years that followed the publication of the 1955 check-list almost nothing was done here. Yet during this period much fundamental research was done on the taxonomy of Syrphidae by workers in various countries. This resulted in so many alterations and amendations that it proved necessary to re-identify all existent material.

In the long history of entomology in Belgium no original work was done on Syrphidae. None of our native species was described by a Belgian. The literature consists almost exclusively of lists of species taken in certain sites.

After 1950 little new material has been added to the I.R.S.N.B. collections, but at Gembloux and, more recently, in the University of Liège new collections have been built up. Many Dutch dipterists (there has been a widespread interest in hoverflies in NL these last 30 years) found excursions here more rewarding than at home and particularly J.A.W. LUCAS collected many Syrphidae that were new to the Belgian fauna. In 1974 members of young naturalists' association started a systematical survey of the northern part of West-Vlaanderen ; K. DECLEER summarised their results here. In recent years much surveying has been done : L. VERLINDEN around Antwerpen and west of Leuven, N. DE BUCK south and east of Leuven, N. MAGIS in the province of Liège, mainly the remoter parts of the Hautes Fagnes.

The bulk of recent material however comes from two sources. From 1960 on first-year students of the Faculté des Sciences Agronomiques (Gembloux) have been required to collect and identify a given number of insects. This supplied a wealth of information on many agricultural regions in the southern half of the country which had hardly been visited by entomologists before. The second source is the material taken in Malaise traps placed in various parts of the country, an initiative taken by P. GROOTAERT (I.R.S.N.B.) in 1980. This was complemented by field work undertaken by post-graduate students of some universities (L. DE BRUYN, K. DECLEER, M. DE MEYER, M. POLLET).

3. MATERIAL & METHOD

3.1. MATERIAL :

3.1.1. Official and museum collections :

- The I.R.S.N.B. collections : The "Belgian" collection, containing a great number of Syrphidae, taken mainly before 1950, was the principal source of historical data. The BEQUAERT , GOETGHEBUER and MARNEF collections, which were donated to the Institute and are kept separately, are important complements. All this material was re-identified according to the latest developments in taxonomy.

- The Gembloux collection : The Faculty of General Zoology and Faunistics of the Faculté des Sciences Agronomiques de l'Etat keeps a large collection of recent (mainly post-1960) material. This was collected partly by staff members in the course of systematic sampling in various localities, and by first-year students. It was nearly all taken in the southern half of the country and supplies important information about agricultural and industrial regions which had hardly been visited by entomologists. All specimens that were confided to us has been identified or re-identified by the first author.

- Universities : The State Universities of Gent (R.U.G.) and Liège possess small collections. N. MAGIS allowed us to identify the material kept at Liège : some valuable old material, but chiefly a large number of Syrphidae taken in the course of recent systematic surveys in the Province of Liège. B. VAN DE PITTE identified the Syrphidae in the R.U.G. collection.

- In the rooms of the Antwerpse Entomologische Vereniging some hoverflies from the BASTIN and ENCKELS collections are kept, material of the twenties and forties respectively. Unfortunately the specimens were in a bad state of preservation and many appeared to be missing.

3.1.2. Private collections :

A number of colleagues allowed us to see and check the hoverflies in their private collections. Their names are found in the acknowledgements. Most contained recent material, except K. VERBEKE's collection which supplied important information on the Flemish provinces in the nineteen-forties.

3.1.3. Records communicated by private collectors :

In response to our request many Belgian and Dutch naturalists sent us lists of their Syrphidae captures. They often sent us the actual specimens, too, difficult or 'critical' species. Part of the material was not seen by the authors. When identifications were judged to be correct they have been used for the present study. Indeed, many of these records were communicated by eminent Syrphidae specialists. In all cases reliable up-to-date identification keys had been used. Doubtful identifications have not been incorporated unless material proof was supplied.

3.1.4. The literature :

Nearly all species lists published in periodicals date back to the period before 1960, i.e. before the publication of fundamental revisions of many genera. This means that keys had been used which are now obsolete ; even SACK's 1932 comprehensive study on palaearctic hoverflies is now known to contain so many errors and contradictions that it is unreliable. Therefore data from the literature have been used very sparingly : in principle only when they concern unmistakable species, like Doros, Triglyphus, Eriozona, Megasyrphus, Blera, Ceriana,...

3.1.5. The Gembloux Card Index (Le Fichier de Gembloux) :

When the E.I.S. project was launched in 1970 entomologists were requested to send their records on standard index cards to the national E.I.S. headquarters at Gembloux. These data have been used with the same reservations as for literature records ; genera revised since have, of course, not been considered. Many index cards were sent in by two scientific collaborators of the Faculté des Sciences Agronomiques, specialists on Syrphidae : M. LECLERCQ and C. FASSOTTE.

3.1.6. Malaise trap records :

As has been said (3.1.1) most of the I.R.S.N.B. material is rather old. This is why Dr P. GROOTAERT started a systematic survey of various habitats by means of Malaise traps soon after his appointment at the Institute. So far this experiment (in a few cases coloured dishes were also used) has proved very successful. No fewer than 15000 hoverflies, belonging to 185 species, have been taken. All have been identified by the present authors.

3.1.7. A systematic local survey in West-Vlaanderen :

This local initiative was started in 1974 and has been going on since. It is mainly the work of members of a national young naturalists' society, many of whom are biologists or biology students. They study the distribution of a number of insect families and orders in the northern half of the province ; hoverflies have been collected by many. K. DECLEER has compiled the data obtained so far.

3.1.8. Field work by the two authors

3.2. METHOD . TECHNICALITIES :

3.2.1. Identification :

Nearly all identifications were carried out using the keys in VAN DER GOOT (1981 and 1986), which will in future be referred to as VdG81 and VdG86. Even before publication the first author, through courtesy of V. S. VAN DER GOOT, disposed of a copy of the manuscript. In addition other handbooks have occasionally been used : BANKOWSKA, 1964, SEGUY, 1961, SACK 1930, 1932. For some recently revised genera the original papers have often been consulted : GOELDLIN, 1974 for Pipizella and Sphaerophoria, GOELDLIN, 1976 for Paragus, CLAUSSEN + TORP, 1980 for Anasimyia, CLAUSSEN + BARKEMEYER, 1986 for Neoascia, DUSEK + LASKA, 1976 for Metasyrphus, etc. Recently the excellent handbook by STUBBS, 1983 has proved to be a very valuable source of additional information.

3.2.2. Nomenclature :

As VdG81 is the basic identification work used by all contributors his nomenclature has been maintained except in one or two instances. Thus we have followed CLAUSSEN + TORP, 1980, who attribute generic status to Anasimyia. As is pointed out in VdG86 Parapenium COLLIN has been found to be synonymous with Trichopsomyia WILLISTON.

These last years a number of name changes, some of them concerning very common species, have been proposed by a number of authors, mainly C.F. THOMPSON. Though some of them (e.g. Neoascia) have been taken up by some authors, we agree with VdG86 that many of these name changes rest on dubious evidence and serve no useful purpose anyway. They will only confuse those amateurs who cannot keep up with recent literature.

3.2.3. Systematics :

No two authors seem to agree on systematics and phylogenetics of Syrphidae. There is a bewildering motley of divisions into sub-families and tribes. We have no competence in this matter, which is moreover irrelevant to our subject. As a new and up-to-date check-list of Belgian Syrphidae had to be drawn up we could not altogether ignore the problem, however. The simplest solution seemed to follow BARENDREGT, 1984 as the author of a recent check-list for NL.

Except for the check-list species are entered in alphabetical order throughout the present paper. In a work of reference this appears to us to be the most practical and time-saving arrangement.

3.2.4. Terminology :

- U.T.M.-squares : When the European Invertebrate Survey was launched a location system was devised that we have adopted here, too. For this purpose a specific projection is used for the maps, named Universal Transverse Mercator Projection, which enables a division of the territory in identical 10 km x 10 km squares. Each of these is given a code of two letters and two figures. Thanks to WONVILLE, 1977, each locality name can swiftly be located on the map. For those readers not familiar with the system more explanations are given in the Appendix.

- Decades : the flight periods have been devided into decades ;
decade 1 (e.g. early May) : 1st - 10 th May
decade 2 (e.g. mid May) : 11th - 20th May
decade 3 (e.g. late May) : 21st - 31st May.
As the third decade may be either 10 or 11 days statistics and histograms show a slight deformation. If we had disposed of a computer we should have adopted weekly periods as a unit.

- Records :By this term is basically meant : the capture or sighting of a certain species by a certain person in a given locality on a certain date. In the overwhelming majority of cases, i.e. when sampling was done in the usual fashion, at random with a net, no account has been taken of the number of specimens. Only when some standard method was adopted we made an exception.
This restriction does not apply to captures effected by means of Malaise traps or coloured dishes. As this is an instrument which works objectively each specimen taken counts as 1 record.
We are aware, of course, of the distorting effect this may have on phenological tables, but felt we could not adopt another course. In the first place the number of specimens was not communicated, or it was only vaguely indicated (several, a few, many...). Secondly, the number of specimens actually taken depends on the mentality of the collector. A conservationist may feel it is not even justifiable to kill a single individual,and a ruthless collector may take any "piece" he can get.

3.3. EVALUATION OF METHOD AND MATERIAL :

3.3.1. This survey does not claim to be comprehensive or even wholly reliable. 67000 records may seem a lot, even for 314 species, but they can hardly give a complete picture of their distribution over 30500 km^2. Nevertheless we felt a provisional and incomplete survey was preferable to the existing situation : there has been no previous publication in this field.

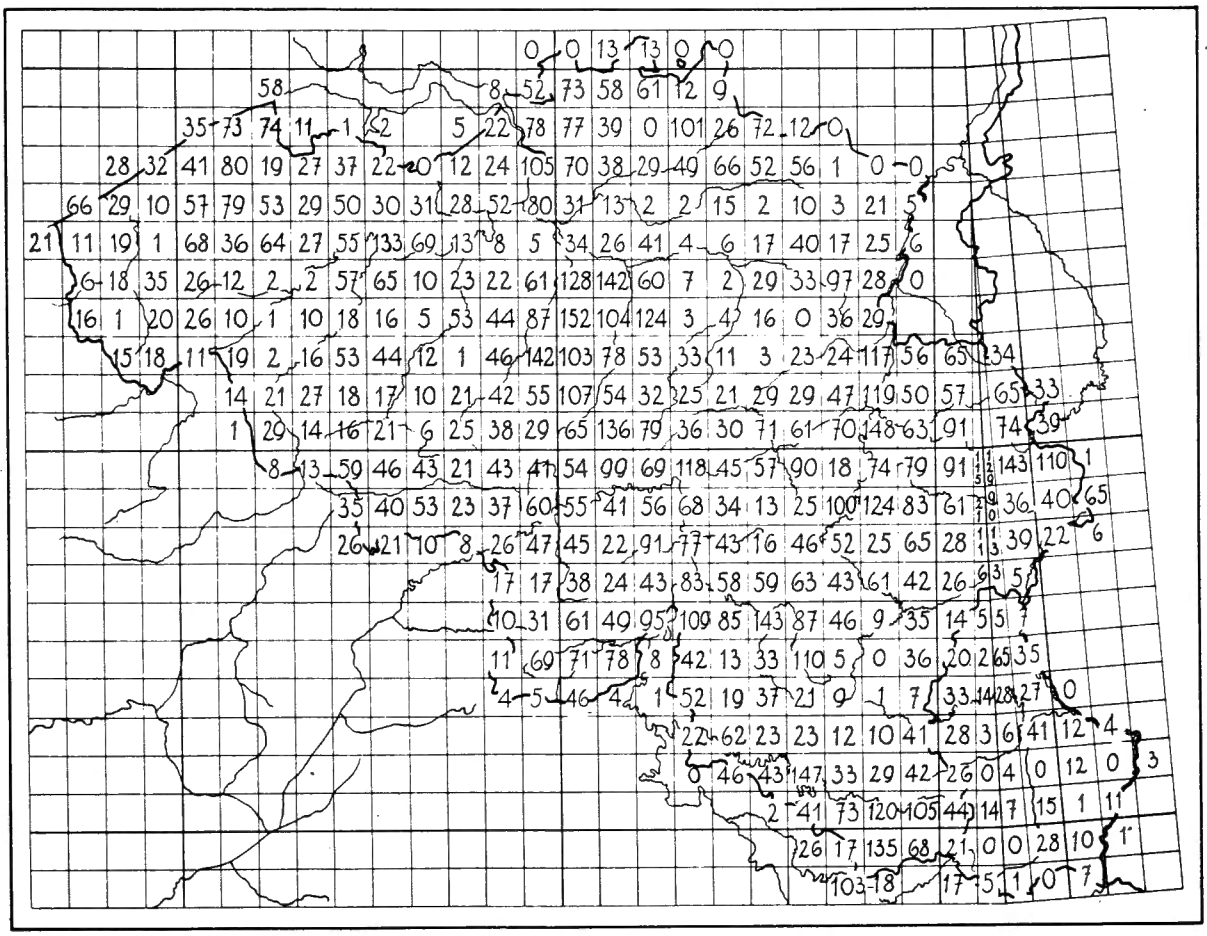
3.3.2. As more information is expected in the near future we might have waited a few years. However, when the available data were compared with what has appeared so far in the "Atlas Provisoire..." we found that we had sufficient material to justify publication. A more detailed comparison is given in Appendix 2.

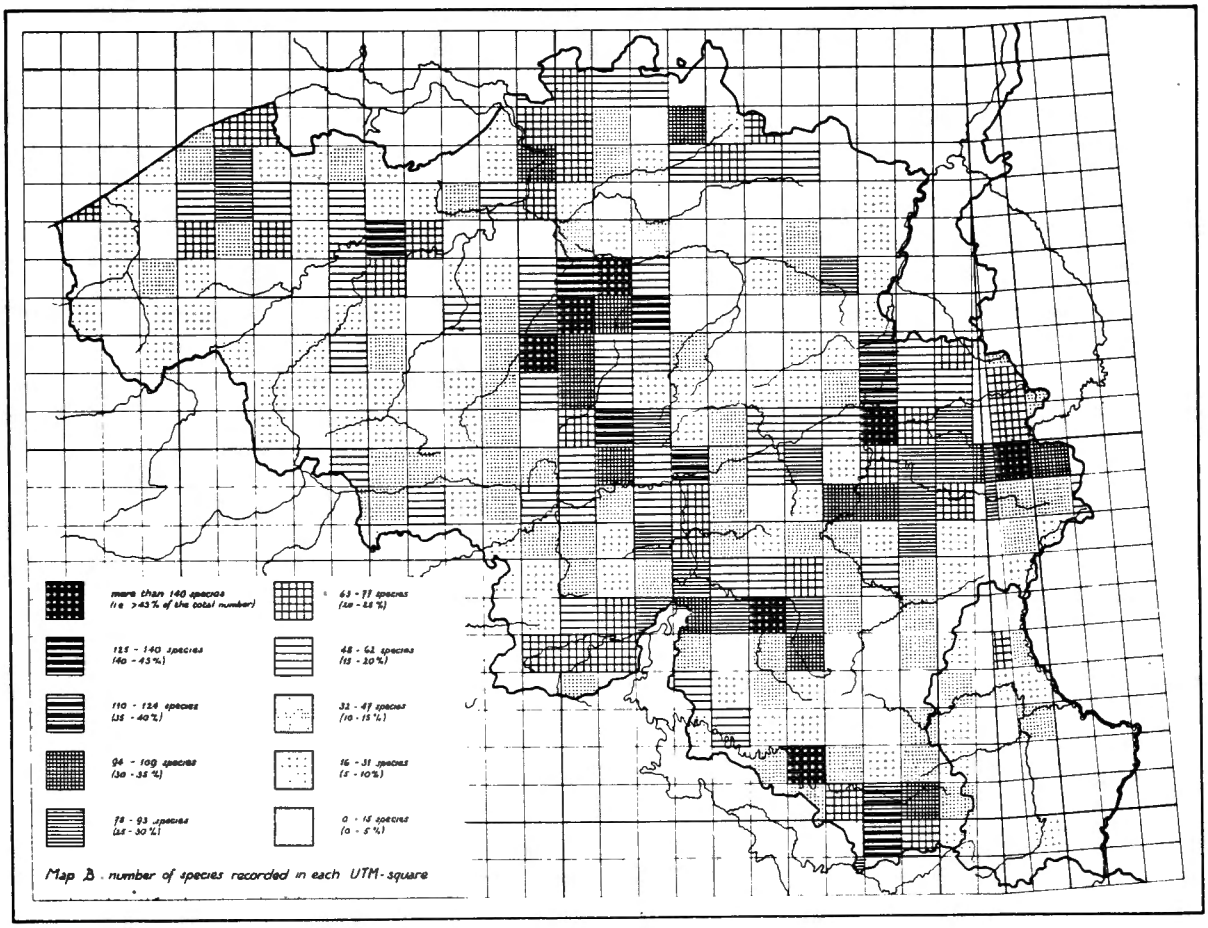
3.3.3. Even so we are aware of the four main deficiencies of our data :

- Records are unevenly spread in space : this is clearly shown in maps A and B, which give the number of species recorded in each square. Though there are hardly any squares where there has been no collecting at all, many regions are poorly known. When comparing these maps A/B to similar synoptic maps in the "Atlas Provisoire" and similar publications, it will be found that the same blank and thinly covered areas appear everywhere. The reasons will be discussed more fully in the section on geographical distribution. Maps A/B are not entirely unrepresentative, however : the low scores in some regions do not only indicate they have been insufficiently sampled, they may also reflect the poverty of their Syrphid fauna.

- Records are unevenly spread in time. By this we mean there is a bias among collectors towards spring and summer excursions, whereas in autumn little field work is done. Yet, even early species are poorly known, particularly in the more remote regions. Most entomologists live in the bigger towns. The immediate neighbourhood of these has been thoroughly explored even in early spring. But in March, April and early May, when there are rather few species about and certainly only in low numbers it is hardly worth while to travel long distances. It is not surprising to find that the earliest species have hardly been recorded except in the centre of the country.
In autumn, on the other hand, there may still be many flies on the wing, but most belong to the more trivial species : there is little to tempt collectors then. So late species are probably underrepresented, too.

- The number of older, i.e. pre-1950, records makes up a very small proportion of the total, a much smaller proportion than in similar studies published in this country. This is because so few among our entomologists collected diptera. Now this is a serious handicap when it comes to comparing the present status of species to their past one.
Some of the larger and more spectacular hoverflies (Doros, Caliprobola, Didea alneti, Eriozona, Ceriana, Sphiximorpha, Volucella zonaria,...) have no doubt always been coveted collectors' pieces. So these may be reasonably well represented in older collections.
There are, however, many less striking-looking species, which are hardly found at all or are completely lacking from older collections : many Epistrophe, Melangyna, Cheilosia, Sphegina, Trichopsomyia, ... are very poorly represented and some appear not to have been taken at all until recent times. There is little chance that additional information on that period will still turn up. So, when we come to the point of defining which species are seriously endangered we have little hard evidence to depart from.





Map B. number of species recorded in each UTM-square

4. THE HOVERFLY FAUNA OF BELGIUM

4.1. AN UP-TO-DATE CHECK LIST :

Sub-family SYRPHINAE

tribus Syrphini

genus Syrphus Fabricius, 1775

- nitidifrons Becker, 1921
- ribesii (Linnaeus, 1758)
- torvus Osten-Sacken, 1875
vitripennis Meigen, 1822

genus Epistrophe Walker, 1852

- diaphana (Zetterstedt, 1843)
- eligans (Harris, 1780)
- euchroma (Kowarz, 1885)
- grossulariae (Meigen, 1822)
- melanostoma (Zetterstedt, 1843)
- melanostomoides (Strobl, 1880)
- nitidicollis (Meigen, 1822)
- ochrostoma (Zetterstedt, 1849)

genus Metasyrphus Dušek + Láska, 1967

- corollae (Fabricius, 1794)
- lapponicus (Zetterstedt, 1838)
- latifasciatus (Macquart, 1829)
- latilunulatus (Collin, 1931)
- luniger (Meigen, 1822)
- nitens (Zetterstedt, 1843)

genus Scaeva Fabricius, 1805

- pyrastri (Linnaeus, 1758)
- selenitica (Meigen, 1822)

genus Dasysyrphus Enderlein, 1938

- albostriatus (Fallén, 1817)
- friuliensis (van der Goot, 1960)
- hilaris (Zetterstedt, 1843)
- lunulatus (Meigen, 1822)
- nigricornis (Verrall, 1873)
- tricinctus (Fallén, 1817)
- venustus (Meigen, 1822)

genus Ischyropsyrphus Bigot, 1882)

- glaucius (Linnaeus, 1758)
- laternarius (O.F. Müller, 1776)

genus Leucozona Schiner, 1860

- lucorum (Linnaeus, 1758)

genus Eriozona Schiner, 1860

- syrphoides (Fallén, 1817)

genus Melangyna Verrall, 1901

- barbifrons (Fallén, 1817)
- cincta (Fallén, 1817)
- compositarum (Verrall, 1873)
- guttata (Fallén, 1817)
- labiatarum (Verrall, 1901)
- lasiophthalma (Zetterstedt, 1843)
- quadrimaculata (Verrall, 1873)
- triangulifera (Zetterstedt, 1843)
- umbellatarum (Fabricius, 1794)

genus Parasyrphus Matsumura, 1917

- annulatus (Zetterstedt, 1838)
- lineola (Zetterstedt, 1843)
- macularis (Zetterstedt, 1838)
- malinellus (Collin, 1952)
- nigritarsis (Zetterstedt, 1843)
- punctulatus (Verrall, 1873)
- vittiger (Zetterstedt, 1843)

genus Xanthogramma Schiner, 1860

- citrofasciatum (De geer, 1776)
- pedissequum (Harris, 1776)

genus Olbiosyrphus Mik, 1847

- laetus (Fabricius, 1805)

genus Doros Meigen, 1803)

- conopseus (Fabricius, 1775)

genus Didea Macquart, 1834

- alneti (Fallén, 1817)
- fasciata Macquart, 1834
- intermedia Loew, 1854

genus Megasyrphus Dušek + Láska, 1967

- annulipes (Zetterstedt, 1838)

genus Episyrphus Matsumura + Adachi, 1917

- auricollis (Meigen, 1822)
- balteatus (De Geer, 1776)
- cinctellus (Zetterstedt, 1843)

genus Sphaerophoria Lepeletier + Serville, 1828

- abbreviata Zetterstedt, 1859
- batava Goeldlin, 1974
- loewi Zetterstedt, 1843
- menthastri (Linnaeus, 1758)
- philantus (Meigen, 1822)
- rueppelli (Wiedemann, 1830)
- scripta (Linnaeus, 1758)
- taeniata (Meigen, 1822)
- virgata Goeldlin, 1974

tribus Chrysotoxini

genus Chrysotoxum Meigen, 1822

- arcuatum (Linnaeus, 1758)
- bicinctum (Linnaeus, 1758)
- cautum (Harris, 1776)
- elegans Loew, 1841
- festivum (Linnaeus, 1758)
- intermedium Meigen, 1822
- latilimbatum Collin, 1940
- octomaculatum Curtis, 1837
- vernale Loew, 1841
- verralli Collin, 1940

tribus Bacchini

genus Baccha Fabricius, 1805

- elongata (Fabricius, 1773)
= obscuripennis Meigen, 1822

genus Xanthandrus Verrall, 1901

- comtus (Harris, 1780)

genus Melanostoma Schiner, 1860

- mellinum (Linnaeus, 1758)
- scalare (Fabricius, 1794)

genus Platycheirus Lepeletier + Serville, 1828

- albimanus (Fabricius, 1781)
- ambiguus (Fallén, 1817)
- angustatus (Zetterstedt, 1843)
- clypeatus (Meigen, 1822)
- discimanus Loew, 1871
- fulviventris (Macquart, 1828)
- immarginatus (Zetterstedt, 1843)
- manicatus (Meigen, 1822)
- ovalis Becker, 1921
- peltatus (Meigen, 1822)
- perpallidus Verrall, 1901
- scambus (Staeger, 1843)
- scutatus (Meigen, 1822)
- sticticus (Meigen, 1822)
- tarsalis (Schummel, 1836-

genus Pyrophaena Schiner, 1860

- granditarsa (Forster, 1771)
- rosarum (Fabricius, 1787)

tribus Paragini

genus Paragus Latreille, 1804

- albifrons (Fallén, 1817)
- bicolor (Fabricius, 1794)
- finitimus Goeldlin, 1971
- flammeus Goeldlin, 1971
- haemorrhous Meigen, 1822
- majoranae Rondani, 1857
- tibialis (Fallén, 1817)

Sub-family MILESIINAE

tribus Pipizini

genus Pipiza Fallén, 1817

- austriaca Meigen, 1822
- bimaculata Meigen, 1822
- fenestrata Meigen, 1822
- festiva Meigen, 1822
- lugubris (Fabricius, 1775)
- luteitarsis Zetterstedt, 1843
- noctiluca (Linnaeus, 1758)
- notata Meigen, 1822
- quadrimaculata (Panzer, 1802)
- signata Meigen, 1822

genus Pipizella Rondani, 1856

- annulata (Macquart, 1829)
- divicoi (Goeldlin, 1974)
- maculipennis (Meigen, 1822)
- varipes (Meigen, 1822)
- virens (Fabricius, 1805)
- zeneggenensis (Goeldlin, 1974)
- spec.

genus Heringia Rondani, 1856

- heringi (Zetterstedt, 1843)
- senilis Sack, 1938

genus Trichopsomyia Williston, 1888
= Parapenium Collin

- carbonaria (Meigen, 1822)
- flavitarse (Meigen, 1822)
- lucida (Meigen, 1822)

genus Neocnemodon Goffe, 1944

- brevidens (Egger, 1865)
- latitarsis (Egger, 1865)
- pubescens Delucchi + Pschorn-Walcher, 1955
- vitripennis (Meigen, 1822)

genus Triglyphus Loew, 1840

- primus Loew,1840

tribus Cheilosiini

genus Cheilosia Meigen, 1822

- acutilabris Becker, 1894
- albipila Meigen, 1838
- albitarsis Meigen, 1822
- antiqua Meigen, 1822
- argentifrons Hellén, 1914
- barbata Loew, 1857
- bergenstammi Becker, 1894
- caerulescens (Meigen, 1822)
- canicularis (Panzer, 1801)
- chlorus (Meigen, 1822)
- chrysocoma (Meigen, 1822)
- cynocephala Loew, 1840
- fasciata Schiner + Egger, 1853
- flavipes (Panzer, 1798)
- fraterna (Meigen, 1830)
- frontalis Loew, 1857
- grossa (Fallén, 1817
- honesta (Rondani, 1868)
- illustrata (Harris, 1780)
- impressa Loew, 1840
- intonsa Loew, 1857
- langhofferi Becker, 1894
- lenis Becker, 1794
- longula (Zetterstedt, 1838)
- maculata (Fallén, 1817)
- mutabilis (Fallén, 1817)
- nasutula Becker, 1894
- nigripes (Meigen, 1822)
- omissa Becker, 1894
- pagana (Meigen, 1822)
- praecox (Zetterstedt, 1843)
  = ruralis Meigen
- proxima (Zetterstedt, 1843)
- pubera (Zetterstedt, 1838)
- rotundiventris Becker, 1894
- ruficollis Becker, 1894
- rufimana Becker, 1894
- scutellata (Fallén, 1817)
- semifasciata Becker, 1894
- soror (Zetterstedt, 1843)
- trisulcata Becker, 1894
- variabilis (Panzer, 1798)
- velutina Loew, 1840
- vernalis (Fallén, 1817)
- vulpina (Meigen, 1822)

genus Psarus Latreille, 1806

- abdominalis (Fabricius, 1794)

genus Rhingia Scopoli, 1763

- campestris Meigen, 1822
- rostrata (Linnaeus, 1758)

genus Ferdinandea Rondani, 1844

- cuprea (Scopoli, 1763)
- ruficornis (Fabricius, 1775)

genus Chamaesyrphus Mik, 1906

- lusitanicus Mik, 1906
- scaevoides (Fallén, 1817)

tribus Chrysogastrini

genus Myolepta Newman, 1838

- luteola (Gmelin, 1788)
- vara (Panzer, 1798)

genus Chrysogaster Meigen, 1822

- chalybeata Meigen, 1822
- hirtella Loew, 1843
- macquarti Loew, 1843
- solstitialis (Fallén, 1817)
- viduata (Linnaeus, 1758)
- virescens Loew, 1854

genus Lejogaster Rondani, 1857

- metallina (Fabricius, 1777)
- splendida (Meigen, 1822)

genus Orthonevra Macquart, 1829

- brevicornis (Loew, 1843)
- elegans (Meigen, 1822)
- geniculata Meigen, 1830
- intermedia Lundbeck, 1916
- nobilis (Fallén, 1817)
- splendens (Meigen, 1822)

genus Brachyopa Meigen, 1822

- bicolor (Fallén, 1817)
- insensilis Collin, 1939
- panzeri Goffe, 1945
- pilosa Collin, 1939
- scutellaris Robineau-Desvoidy, 1844
- testacea (Fallén, 1817)
- vittata (Zetterstedt, 1843)

genus Sphegina Meigen, 1822

- clunipes (Fallén, 1817)
- kimakowiczi Strobl, 1897
- nigra Meigen, 1822
  = clavata Scopoli s. Thompson
- sibirica Stackelberg, 1953

genus Neoascia Williston, 1886

- aenea (Meigen, 1822)
  = meticulosa Scopoli
- dispar (Meigen, 1822)
  = tenur Harris
- floralis (Meigen, 1822)
- geniculata (Meigen, 1822)
- interrupta (Meigen, 1822)
- obliqua Coe, 1940
- podagrica (Fabricius, 1775)
- unifasciata (Strobl, 1898)

tribus Callicerini

genus Callicera Panzer, 1809

- aenea (Fabricius,1777)
- bertolonii Rondani, 1857
- rufa Schummel, 1841

tribus Pelecocerini

genus Pelecocera Meigen, 1822

- tricincta Meigen, 1822

Tribus Eumerini

genus Eumerus Meigen, 1822

- flavitarsis Zetterstedt, 1843
- ornatus Meigen, 1822
- sabulonum (Fallén, 1817)
- sogdianus Stackelberg, 1952
- strigatus (Fallén, 1817)
- tarsalis Loew, 1848
- tricolor Meigen, 1822
- tuberculatus Rondani, 1857

tribus Microdontini

genus Microdon Meigen, 1803

- devius (Linnaeus, 1761)
- eggeri Mik, 1897
- mutabilis (Linnaeus, 1758)

tribus Volucellini

genus Volucella Geoffroy, 1762

- bombylans (Linnaeus, 1758)
- inanis (Linnaeus, 1758)
- inflata (Fabricius, 1794)
- zonaria (Poda, 1761)

tribus Sericomyini

genus Sericomyia Meigen, 1803

- lappona (Linnaeus, 1758)
- silentis (Harris, 1776)
  = borealis Fallén

genus Arctophila Schiner, 1860

- bombiformis (Fallén, 1810)
- fulva (Harris, 1780)
  = mussitans Fabricius

tribus Xylotini

genus Xylota Meigen, 1822 = Zelima Mg.

- abiens Meigen, 1822
- coeruleiventris (Zetterstedt, 1843)
- curvipes Loew, 1854
  = Chalcosyrphus curvipes(Loew)
- femorata (Linnaeus, 1758)

  = Chalcosyrphus femoratus (L.)
- florum (Fabricius, 1805)
- ignava (Panzer, 1798)
- lenta Meigen, 1822
  = Brachypalpoides lentus (Meigen)
- meigeniana Stackelberg, 1970
- nemorum (Fabricius, 1805)
  = Chalcosyrphus nemorum (Fabr.)
- pigra (Fabricius, 1794)
  = Chalcosyrphus piger (Fabr.)
- segnis (Linnaeus, 1758)
- sylvarum (Linnaeus, 1758)
- tarda Meigen, 1822
- xanthocnema Collin, 1939

genus Brachypalpus Macquart, 1834

- eunotus Loew, 1873
  = Chalcosyrphus eunotus (Loew)
- laphriformis (Fallén, 1816)
  = bimaculatus (Macquart)
- meigeni Schiner, 1857
- valgus (Panzer, 1798)

genus Caliprobola Rondani, 1844

- speciosa (Rossi, 1790)

genus Syritta Lepeletier + Serville, 1825

pipiens (Linnaeus, 1758)

genus Tropidia Meigen, 1822

- fasciata Meigen, 1822
- scita (Harris, 1780)

genus Spilomyia Meigen, 1803

- saltuum (Fabricius, 1794)

genus Temnostoma Lepeletier + Serville, 1825

- apiforme (Fabricius; 1794)
- bombylans (Fabricius, 1805)
- vespiforme (Linnaeus, 1758)

genus Pocota Lepeletier + Serville, 1828

- personata (Harris, 1780)
  = apiformis (Schrank)

genus Criorhina Meigen, 1822

- asilica (Fallén, 1817)
- berberina (Fabricius, 1805)
- floccosa (Meigen, 1822)
- pachymera Egger, 1858
- ranunculi (Pnazer, 1804)

genus Blera Billberg, 1820
= Cynorrhina Williston

- fallax (Linnaeus, 1758)

tribus Cerioidini

genus Ceriana Rafinesque, 1815

- conopsoides (Linnaeus, 1758)

genus Sphiximorpha Rondani, 1850

- subsessilis (Illiger, 1807)

tribus Merodontini

genus Merodon Meigen, 1822
= Lampetia Meigen, 1800

- aeneus Meigen, 1822
- avidus (Rossi, 1790)
= spinipes Fabricius
- equestris (Fabricius, 1794)
- ruficornis Meigen, 1822
- rufus Meigen, 1838

Sub-family ERISTALINAE

tribus Eristalini

genus Helophilus Meigen, 1822
= Tubifera Meigen 1800

- hybridus Loew, 1846
- pendulus (Linnaeus, 1758)
- trivittatus (Fabricius, 1805)

genus Anasimyia Schiner, 1864

- contracta Claussen + Torp, 1980
- interpuncta (Harris, 1776)
- lineata (Fabricius, 1787)
- lunulata (Meigen, 1822)
- transfuga (Linnaeus, 1758)

genus Lejops Rondani, 1857

- vittata (Meigen, 1822)

genus Parhelophilus Girschner, 1897

- consimilis (Malm, 1823)
- frutetorum (Fabricius, 1775)
- versicolor (Fabricius, 1794)

genus Mallota Meigen, 1822

- cimbiciformis (Fallén, 1817)
- fuciformis (Fabricius, 1794)

genus Eristalis Latreille, 1804

- abusivus Collin, 1931
- aeneus (Scopoli, 1763)
- alpinus (Panzer, 1798)
- arbustorum (Linnaeus, 1758)
- cryptarum (Fabricius, 1794)
- horticola (De Geer, 1776)
- intricarius (Linnaeus, 1758)
- jugorum Egger, 1858
- nemorum (Linnaeus, 1758)
- pertinax (Scopoli, 1763)
- ? piceus (Fallén, 1816)
- pratorum Meigen, 1822
- rupium Fabricius, 1805
- sepulchralis (Linnaeus, 1758)
- tenax (Linnaeus, 1758)

genus Myathropa Rondani, 1845

- florea (Linnaeus, 1758)

4.2. CHECK LIST : DISCUSSION

4.2.1. This new check list was overdue. In the thirty-odd years that have passed since the publication of the former check list (M. LECLERCQ, 1955) many more species have been discovered in the field or among museum specimens ; there have also been far-reaching changes in taxonomy and systematics. Most of this new information has already been published, but it is widely scattered, so it needs to be summarised. No doubt this new check list will soon become obsolete in its turn : further developments in a number of genera (Pipiza, Cheilosia, Eristalis) have been announced. Additional species may turn up (Psilota anthracina, Metasyrphus lundbecki, Hammerschmidtia ferruginea, Sphegina verecunda, Neocnemodon verrucula,...)

4.2.2. The following figures show the scope of the changes that have been made in LECLERCQ's 1955 catalogue. He listed 237 species, plus 7 varieties which have since then acquired specific status. In our opinion 17 of these ought to be deleted. Of the remaining 227 a considerable number have been transferred to other genera. There are 314 names on our new check list, an increase of 87, an increase of 38 %.

4.2.3. Names to be deleted from M. LECLERCQ, 1955 :

- Baccha obscuripennis MEIGEN : We follow M. SPEIGHT (1978), who considers this to be synonymous with elongata. VAN DER GOOT (1982) has already shown that the females cannot be separated, though he thought the males usually could. The differences in the male genitalia are so insignificant and SPEIGHT has seen transitional forms. There are no apparent ecological differences either : distribution, habitat and flight period are practically identical.

- Platycheirus fasciculatus LOEW : was only mentioned for B by JACOBS (1901). As it is a good species it was retained by LECLERCQ. However, no material has been found and the species is not known from neighbouring countries. It was presumably an identification error.

- Melanostoma dubium ZETTERSTEDT : was mentioned exclusively by JACOBS, too. Specimens labelled "dubium" in the I.R.S.N.B. collection were melanistic forms of scalare and mellinum. In the Alps M. dubium does not seem to descend below 1800 m, so its occurrence here is highly improbable.

- Syrphus arcuatus FALLEN : This name was repeatedly applied to Metasyrphus lapponicus, Megasyrphus annulipes and other Syrphus s.l. S. arcuatus sensu COLLIN and COE is in fact Metasyrphus lundbecki SOOT-RYEN, which has not yet been taken in this country.

- Syrphus curvipes BOHEMAN : AS VdG81 rightly supposed this record referred to a small and dark specimen of Episyrphus auricollis.

- Syrphus liophthalmus SCHINER ET EGGER : This mountain species is not known from neighbouring regions. The only literature reference may concern Olbiosyrphus laetus, which is not dissimilar and has hairy eyes like Xanthogramma leiophthalma.

- Chrysotoxum fasciolatum DE GEER : This mountain species is known from the Vosges and the Schwarzwald and its presence here is not altogether excluded. The material labelled "fasciolatum" turned out to be C. cautum.

- Ferdinandea nigrifrons EGGER : This is a synonym of F. cuprea. The male genitalia appear identical and morphological distinctions are rather dubious, too. Transitional forms with partially black frons are not uncommon and the size is far more variable than the original description wants us to believe.

- Chrysogaster aenea MEIGEN : Various Chrysogaster and Lejogaster specimens in I.R.S.N.B. bore this name on the labels. Misidentifications.

- Pipiza dubia LUNDBECK : No material has been found.

- Cnemodon morionellus ZETTERSTEDT and C. fulvimanus ZETTERSTEDT : both errors of identification. See also VdG81.

- Cheilosia conops BECKER : This mountain species can only be distinguished from C. vulpina by the pilosity of the arista. In our opinion the specimens in question were all vulpina, which is also known from adjacent regions. Moreover J.A.W. LUCAS (in litt.) suspects them to be synonymous : in his collections there are transitional forms.

- Brachyopa conica (PANZER) and Brachyopa dorsata : see 4.2.4. and also the entry in the Specific part.

- Cheilosia insignis LOEW : Several specimens labelled thus were found in I.R.S.N.B. They were all quite normal looking pagana with largely yellow legs. This mountain species of high altitude is not likely to occur here. It is bigger than pagana and the legs are quite black.

- Eristalis nigritarsis MACQUART : Listed by JACOBS only, no material was found. Probably there has been confusion with E. nemorum var. sylvarum MEIGEN, which have normally brownish antennae and partially yellow hind femora.

- Eristalis vitripennis STROBL : According to H. HIPPA (in litt.) this is a synonym of E. rupium.

- Microdon latifrons : As M. LECLERCQ pointed out himself later (1962) in his revision of Belgian Microdon, records referred to eggeri ; latifrons is a mountain species and not indigenous here.

4.2.4. Species added to the Belgian check list after 1955 :

- genus Paragus : Two species only were listed by LECLERCQ and it is not clear which they represent. All available material was re-identified according to GOELDLIN's 1976 revision of the genus : no fewer than 7 species have been taken in this country.

- genus Platycheirus : Specimens of 5 additional species were found in collections ; some were correctly identified, but had apparently not been published.

- genus Sphaerophoria : Five species of the menthastri-group are now known to occur here. Some of them were listed as varieties by M. LECLERCQ.

- genus Syrphus (sensu lato) : Most species have been transferred to other genera, following VdG81, and 11 new names have been added. Though it is of doubtful status Dasysyrphus hilaris has been maintained, if only for future reference. In older collections material was found of Melangyna labiatarum, Parasyrphus malinellus, P. punctulatus and Dasysyrphus friuliensis. Six further species were discovered in the field after 1955 : Syrphus nitidifrons, Melangyna compositarum, Epistrophe melanostoma, E. melanostomoides, Parasyrphus nigritarsis and Dasysyrphus nigricornis.

- genus Chrysotoxum : C. latilimbatum (doubtful status !) and C. verralli were discovered in the I.R.S.N.B. collection.

- genus Brachyopa : The recent revision of the genus by C.F.THOMPSON (1980) has made COLLART's 1947 paper obsolete. B. conica is no longer valid and B. dorsata is not indigenous. Specimens labelled "conica" were either testacea or vittata ; dorsata had been confused with panzeri.

- genus Sphegina : LECLERCQ only mentioned clunipes, so that 3 species have been added here. There was some material in I.R.S.N.B. of both kimakowiczi and nigra, and quite recently sibirica has been taken by several Dutch colleagues in the Hautes Fagnes. THOMPSON + TORP (1986) chose to call nigra an old SCOPOLI name, clavata : the evidence for this is very slight, however ; see also VdG86, p.22.

- genus Neoascia : Unknown to M. LECLERCQ two more Neoascia species had been taken in B and correctly identified (I.R.S.N. B. collection) : geniculata and interrupta. On the other hand many specimens labelled floralis were misidentified. The only known Belgian floralis are in the LUCAS collection.
In 1986 it was proved by CLAUSSEN + BARKEMEYER that Neoascia obliqua var. imperfecta VAN DOESBURG (listed by M. LECLERCQ as a variety) is a bona species and synonymous with N. unifasciata STROBL.

- genus Pipizella : The only species mentioned in the 1955 check list was virens ; it was found that 7 species have been taken here, though two are probably strays. One of these has not yet been described and named : it will feature in a revision of the genus planned by GOELDLIN and LUCAS.

- genus Trichopsomyia : M. LECLERCQ listed flavitarse (as Parapenium flavitarse) and carbonaria (as Pipiza carbonaria). A third species is added : T. lucida, which was found to be a bona species by GOELDLIN.

- genus Pipiza : A revision of this baffling genus is long overdue. There have been attempts, but difficulties proved too great (see also STUBBS, 1983). Until further notice some species of doubtful status (fenestrata, notata, signata)are maintained.

- genus Neocnemodon : After the revision by DELUCCHI and PSCHORN-WALCHER (1955) it was necessary to re-identify the collected specimens. There were males of brevidens and pubescens ; latitarsis was recently discovered in the field.

- genus Cheilosia : There were 33 species in M. LECLERCQ, 1955 ; 2 were deleted, but 14 new names were added: acutilabris, argentifrons, caerulescens, langhofferi, lenis, maculata, nasutula, omissa, rotundiventris, rufimana, semifasciata, trisulcata, velutina, vulpina. C. bigoti has been mentioned from L by J.A.W. LUCAS and in 1986 K. DECLEER took a female Cheilosia at L'Eglise (FR.81) which might be bigoti. As no material for comparison is available the species has not been added to the check list.
No doubt more names will be added in the near future. Proxima and vernalis are species complexes and a revision is being prepared. On the other hand rotundiventris is rather a doubtful species in our opinion : there are all sorts of intermediate forms with "vernalis".

- genus Eumerus : Specimens of 4 additional species have been found in I.R.S.N.B. : tarsalis (possibly strays), tuberculatus, flavitarsis, sogdianus.

- genus Sphiximorpha : S. (= Ceriana) subsessilis was found in some collections.

- genus Callicera : The genus has never been mentioned in the literature for this country. 4 specimens belonging to 3 species are now recorded.

- genus Myolepta : A second species, M. vara, has been added.

- genus Mallota : M. cimbiciformis, though mentioned only by JACOBS (1901), has been maintained, even though no proof has been found, because it is known from all neighbouring regions.

- genus Xylota : Five more species have been added. X. pigra, tarda and xanthocnema were present in I.R.S.N.B. X. meigeniana was described only in 1970 and coeruleiventris has recently been found to be a bona species. Both had been confused with florum ; literature references to florum are therefore unreliable.

- genus Merodon : Material has been found back belonging to two additional species : ruficornis and rufus.

- genus Helophilus s.l. : Here, too, another two species were found in I.R.S.N.B.: Parhelophilus consimilis and Helophilus (s.s.) hybridus.

- genus Brachypalpus : B. bimaculatus MACQUART is synonymous with laphriformis. Two additional species were found : eunotus and meigeni.

- genus Eristalis : Not to be found in LECLERCQ, 1955 are : E. abusivus and Eristalis ? piceus FALLEN. The latter has been provisionally identified by CLAUSSEN ; it is a rupium-like species found in lowland marshes also in NL and D (CLAUSSEN, 1986) ; it corresponds with FALLEN's description. It is hoped the matter will be clarified when HIPPA publishes his revision of the genus.

TABLE 1 : EXPLANATIONS AND COMMENTS

This synoptic table summarises a variety of data on the Syrphidae of this country : frequency, geographical distribution within the territory, the known habitat links, the biology of the larvae, the extreme dates of capture, their present status.

A. FREQUENCY :

- column 1 : the total number of fully dated records. It may happen that the figure in this column is inferior to the number of squares as given in column 2. For mapping purposes incompletely dated or undated records have been retained ; in the early days collectors often wrote only the name of the locality on the label and then the month and year of the capture, sometimes only the year.

- column 2 : the total number of U.T.M.-squares where the species has ever been recorded, before 1950 and after.

- column 3 : the number of U.T.M.-squares where the species was recorded exclusively before 1950. The comparison of this figure with the one in the previous column gives some indication as to whether the species is less frequent than it used to be or not.

- column 4 : the frequency class to which the species has been relegated on the basis of the figure in column 2 (see also section 8.4)

B. GEOGRAPHICAL DISTRIBUTION IN B AND L :

For this purpose the presence of the species in one or more of the phytogeographical districts is noted. A brief description of the phytogeographical districts (after DE LANGHE et al. (1978) in connection with the Syrphid fauna is given in Appendix 3.

Legend : + means the species has been recorded in the district since 1949.
- means that the species was recorded in the district before 1950 only.
. means it has not been recorded there to our knowledge.

C. HABITAT(S) :

As far as the information was available the type of habitat is noted here in which the species is normally taken in these regions. The habitat link of some Syrphidae is not universal ; Pyrophaena rosarum, e.g., is limited to marshes in NL, in the greater part of this country it also occurs in humid forest.

When the biotope is placed between brackets this means that the species is often taken there, but by no means exclusively so.

As the habitat link may be conditioned by the requirements of the larvae the larval type has been added, too :

Legend : a means the larva lives in an aquatic environment
c means the larva is carnivorous
ph means the larva bores in living plant parts (phytophagous)
n means the larva lives in the nests of other insects
w means the larva lives in rotting or mouldering wood
s means the larva feeds on sap running from tree wounds
d means the larva lives in dung or rotting organic material other than wood.

Nearly 30 of our hoverflies are known (or suspected) to migrate over long distances. The information used here is based on AUBERT et al. (1976). Species known to migrate in large numbers are indicated by "M" ; those migrating in small number by "m". If migration is suspected only, this is indicated by (m).

D. FLIGHT PERIOD :

Only the earliest and latest known dates of capture are given. Full data on the phenology of each species will be given in Table .

For very rare species all known dates of capture are listed.

The dates between brackets refer to exceptionally early or unusually late captures, i.e. preceded or followed by at least one decade during which no captures have been recorded. Some are no doubt freak eclosures brought about by exceptional climatic circumstances ; others may concern labelling errors ; some may point to an extra generation about which little is known.

E. THREATENED SPECIES :

This point has been treated more fully in 8.1 and 8.2.

Legend : ✪ the species is probably extinct here, or virtually so.
★ the species is thought to be endangered ; it seems much less frequent nowadays than it used to all over the territory.
☆ the species is thought to be threatened or extinct in part of the territory, but still prospering elsewhere.

Table 1

	FREQUENCY				DISTRIBUTION							HABITAT(S)			FLIGHT PERIOD	
	total number of records	total number of UTM-squares	n. of UTM-sq. before 1950	frequency class	Maritime D.	Vlaams D.	Kempen D.	Brabants D.	D. Mosan	D. Ardennais	D. Lorrain	adult flies	larval type	migrants		threatened species
Anasimyia contracta	5	5	1	9	+	+	.	+	.	.	.	wetlands	a		16.VI - 2.IX	
A. interpuncta	58	30	5	6	+	+	+	+	+	.	.	id.	a		15.IV - 26.VIII	
A. lineata	146	49	7	5	+	+	+	+	+	+	+	id.	a		20.IV - 16.IX	
A. lunulata	4	2	1	10	.	+	—	.	.	.	.	id.	a		19.IV - 8.VIII	★
A. transfuga	63	32	7	6	+	+	+	+	+	+	.	id.	a		4.V - 23.IX	
Arctophila bombiformis	95	43	15	6	.	.	.	—	+	+	+	woodland, bog	a?		8.VI - 2.X	☆
A. fulva	64	40	27	6	.	—	.	—	+	+	+	id.	a?		(25.IV) 11.VI - 4.XI	★
Baccha elongata	283	119	23	4	+	+	+	+	+	+	+	woodland	c		9.IV - 24.X	
Blera fallax	11	7	—	9	.	.	.	.	.	+	+	id.	w		20.V - 14.VIII	
Brachyopa bicolor	18	14	7	8	.	—	+	—	.	+	+	id.	s		26.IV - 23.V	
B. insensilis	4	3	2	10	.	.	.	—	+	.	.	id.	s		2.V - 3.VI	✪
B. panzeri	47	6	1	9	.	.	.	.	.	+	+	id.	s		7.V - 21.VI	
B. pilosa	55	18	5	7	.	+	+	+	+	+	+	id.	s		15.IV - 30.VI	
B. scutellaris	40	17	4	7	.	+	+	+	+	+	.	id.	s		18.IV - 25.VI	
B. testacea	30	10	2	8	.	.	.	+	+	+	.	id.	s		6.V - 4.VII (28.VII)	
B. vittata	5	3	—	10	.	.	.	.	.	+	.	id	s		30.VI - 11.VIII	
Brachypalpus cunotus	2	1	—	10	.	.	.	.	.	+	.	id.	w		10.V , 15.V	
B. laphriformis	13	13	2	8	.		+	+	+	+	.	(woodl.), orchard	w		28.IV - 20.VI	
B. meigeni	1	1	—	10	.	.	.	.	.	+	.	woodl.	w		14.V	
B. valgus	6	5	3	9	.	+	.	.	+	+	.	id.	w		31.III - 22.V	
Caliprobola speciosa	41	36	9	6	.	.	+	+	+	+	.	deciduous for.	w		5.VI - 10.VII	
Callicera aenea	1	1	—	10	.	.	.	.	+	.	.	(woodland)	w		30.VI	
C. bertolonii	2	2	—	10	.	.	.	+	.	+	.	id.	w		2.V , 3.IX	
C. rufa	1	1	—	10	.	.	.	.	.	+	.	id.	w		26.VI	
Ceriana conopsoides	21	22	15	7	.	—	—	+	+	+	—	deciduous for.			15.VIII - 10.IX	☆
Chamaesyrphus lusitanicus	6	2	2	10	.	.	—	.	.	.	.	heaths	?		?	✪
C. scaevoides		2	1	10	.	.	.	.	+	+	+	heaths	?		9.V - 12.IX	★
Cheilosia acutilabris	2	2	—	10	.	.	.	.	.	+	+	woodland	ph		8.VII , 8.VIII	
C. albipila	103	62	12	5	+	+	+	+	+	+	+	woods, carr	"		16.III - 5.VI (20.IX , 15.X)	
C. albitarsis	1240	220	15	2	+	+	+	+	+	+	+	eur.	"		6.III - 29.VIII	
C. antiqua	22	21	2	7	.	.	.	.	+	+	+	deciduous for.	"		14.IV - 10.VI	
C. argentifrons	7	6	1	9	.	—	.	+	+	+	+	woodland	"		1.V - 27.V	
C. barbata	117	60	10	5	.	.	.	—	+	+	+	eur.	"		(5.V, 6.V) 23.V - 30.VIII	
C. bergenstammi	53	34	9	6	+	+	+	+	+	+	+	(woodland)	"		21.IV - 23.VI ; 26.VII - 13.IX	
C. caerulescens	4	4	—	9	.	.	.	.	+	.	.	xerophilous?	"		20.V - 12.VI (20.IX)	
C. canicularis	126	66	15	5	+	.	.	+	+	+	+	eur.	"		21.IV - 27.VI; (11.VII) 18.VII - 21.X	
C. carbonaria	102	26	7	6	.	+	+	+	+	+	+	humid woodl.	"		9.V - 19.IX	
C. chlorus	110	40	7	6	.	+	+	+	+	+	+	(humid woodl.)	"		(20.III) 9.IV - 19.VI	
C. chrysocoma	38	34	13	6	.	.	—	+	+	+	+	woodland	"		6.IV - 22.V (13.VI , 17.VI , 6.VII)	
C. cynocephala	25	12	1	8	+	+	+	+	+	+	.	(grassland)	"		12.V - 5.IX	
C. fasciata	18	4	1	9	.	.	.	+	.	+	.	deciduous for.	"		25.III - 15.V	
C. flavipes	32	26	4	6	.	.	+	+	+	+	+	woodland (dry)	"		23.IV - 5.VI	
C. fraterna	87	48	14	6	+	+	+	+	+	+	+	wetlands	"		15.IV - 16.VI	
C. frontalis	2	2	—	10	.	.	.	.	.	+	.		"		7.V , 11.V	
C. grossa	37	26	4	6	+	+	+	+	+	+	+	(carr)	"		3.III - 27.IV	
C. honesta	27	16	2	7	.	.	+	+	+	+			"		25.IV - 21.VI (4.VII)	
C. illustrata	388	139	6	3	.	+	+	+	+	+	+	woodland	"		11.V - 18.IX	
C. impressa	192	65	16	5	+	+	+	+	+	+	+	grassland	"		13.V - 4.X (14.X)	
C. intonsa	33	28	10	6	+	+	+	—	.	+	+	eur.?	"		1.V - 20.IX	
C. langhofferi	2	2	1	10	.	.	.	.	—	+	.		"		14.V , 26.V	
C. lenis	89	48	9	6	.	.	—	+	+	+	+	woodland	"		8.IV - 15.VI	
C. longula	26	21	8	7	.	+	+	+	+	+	.	heath, dry woods	"		4.VII - 28.IX	
C. maculata	158	15	4	8	.	.	.	+	+	+	+	deciduous forest	"		3.V - 21.VI (18.VII)	
C. nasutula	47	24	6	7	.	.	.	+	+	+	+	woodland	"		28.IV - 14.VII (11.VIII)	
C. nigripes	20	20	6	7	.	.	.	+	+	+	+	id.	"		6.V - 16.VI	
C omissa ♀♀	2	3	—	10	.	.	.	+	.	.	.	id	"		3.V , 3.VI	
C. pagana	889	155	10	3	+	+	+	+	+	+	+	eur.	"		28.III - 1.X	
C. praecox	33	26	6	6	+	+	+	+	+	+	+	eur.?	"		14.IV - 8.VI	
C. proxima	87	34	5	6	.	+	+	+	+	+	+	eur.	"		30.IV - 28.VIII	
C. pubera	6	6	2	9	.	.	.	+	+	.	+		"		10.V - 10.VI (29.VII)	
C. rotundiventris	16	12	1	8	.	+	.	+	+	+	+	woodland	"		19.IV - 2.VIII	
C. ruficollis	5	4	—	9	.	.	.	+	+	+	+	id.	"		8.V - 29.VIII	
C. rufimana	20	14	1	8	.	.	.	+	+	+	.	id.	"		24.IV - 2.VI (1.VII)	
C. scutellata	118	67	22	5	.	+	+	+	+	+	+	id.	"		2.V - 20.IX	
C. semifasciata	11	11	3	8	.	+	.	+	+	+	.	id.	"		2.V - 14.VI	
C. soror	10	8	3	9	.	.	.	.	+	.	+	xerophilous	"		9.VI - 16.IX	
C. trisulcata ♀♀	4	4	—	9	.	.	.	+	+	+	+	woodland?	"		19.IV - 27.V	
C. variabilis	353	141	17	3	+	—	+	+	+	+	+	woodland	"		4.IV - 1.IX	
C. velutina	42	24	3	7	+	.	.	+	+	.	+	(dry) grassl.	"		(2.V) 1.VI - 16.IX	
C. vernalis	208	97	12	4	+	+	+	+	+	+	+	eur.	"		7.IV - 14.X	
C. vulpina	17	13	5	8	.	.	.	+	+	+	+	xerophilous	ph		21.IV - 14.VI ; 11.VII - 21.VIII	
Chrysogaster chalybeata	63	29	5	6	.	+	+	+	+	+	+	(dry?) grassl.	a		12.V - 7.IX	
C. hirtella	279	96	12	4	+	+	+	+	+	+	+	wetlands	a		20.IV - 17.IX	
C. macquarti	1	1	1	10	.	.	+	.	.	.	.	heath bogs	a		13.VII	
C. solstitialis	256	106	28	4	+	+	+	+	+	+	+	humid forest	a		(16.III , 28.III) 2.V - 28.IX	
C. vicluata	164	109	33	4	+	+	+	+	+	+	+	wet grassland	a		7.V - 30.VII (18.VIII, 28.VIII, 2.X)	
C. virescens	17	13	6	8	.	+	+	+	+	+	.	bogs ?	a		27.IV - 17.IX	
Chrysotoxum arcuatum	115	48	12	6	.	.	+	—	+	+	+	woodland	n		13.V - 25.IX	
C. bicinctum	323	107	22	4	+	+	+	+	+	+	+	eur.	n		21.V - 10.IX (23.IX , 4.X)	
Cheilosia mutabilis	75	48	21	6	+	+	+	+	+	+	+	woodland	ph		28.V - 9.IX	

Table 1 (2)

	FREQUENCY				DISTRIBUTION							HABITAT(S)			FLIGHT PERIOD	
	total number of records	total number of U.T.M.-squares	n. of U.T.M.-sq. before 1980 only	frequency class	Maritime D.	Vlaams Distr.	Kempen D.	Brabants D.	D. Mosan	D. Ardennais	D. Lorrain	adult flies	larval type	migrants		threatened species
Chrysotoxum cautum	642	162	14	3	+	+	+	+	+	+	+	(woodland)	n		(1.IV) 16.IV - 2.IX	
C. elegans	13	16	14	7	.	.	–	+	–	+	+		.		11.V - 15.IX	★
C. festivum	91	69	33	5	+	.	+	+	+	+	+	woodland	"		3.V - 9.IX	
C. intermedium	5	7	6	9	.	.	.	+	–	–	–		"		15.V - 12.VII	✪
C. latilimbatum	(1)	1	1	10	.	.	.	.	.	.	–		"		?	
C. octomaculatum	10	10	6	8	.	.	+	–	–	+	+	heaths	"		25.V - 9.IX	★
C. vernale	36	29	7	6	.	.	+	.	+	+	+	(heaths)	"		4.V - 12.VII (2.VIII)	
C. verralli	7	8	2	9	.	.	.	–	+	.	+	woodland	"		1.VII - 27.VIII	
Criorhina asilica	43	32	10	6	.	+	+	+	+	+	+	deciduous forest	W		9.V - 21.VI (2.VII)	
C. berberina	268	90	9	4	+	+	+	+	+	+	+	woodland	"		7.IV - 21.VIII	
C. floccosa	21	14	2	8	.	+	.	+	+	.	.	id.	"		5.IV - 21.VI (10.VII)	
C. pachymera	5	6	2	9	.	.	+	+		.	.	id.	"		28.IV - 20.V	
C. ranunculi	16	9	5	8	.	.	+	+	+	.	+	id	"		17.III - 5.V	
Dasysyrphus albostriatus	234	105	15	4	+	+	+	+	+	+	+	(woodland)	C	m	(27.III) 18.IV - 19.IX	
D. friuliensis	33	18	1	7	.	.	.	+	+	+	+	woodland	"		3.V - 30.VII	
D. hilaris	105	58	13	5	+	+	+	+	+	+	+	id	"		20.IV - 21.VII	
D. lunulatus	102	45	7	6	+	+	+	+	+	+	+	conifer woods	"		(9.IV) 22.IV - 26.VII (7.VIII, 8.VIII)	
D. nigricornis	1	1	–	10	.	.	.	.	.	+	.		"		7.V	
D. tricinctus	180	95	22	4	+	+	+	+	+	+	+	eur.	"		26.IV - 10.X	
D. venustus	415	129	15	3	+	+	+	+	+	+	+	woodland	"		(8.IV) 20.IV - 31.VII (19.VIII)	
Didea alneti	29	26	17	6	.	.	+	+	+	+	+	id.	"	(m)	12.V - 28.IX (17.X)	
D. fasciata	71	45	11	6	.	+	+	+	+	+	+	eur.	"	m	3.V - 16.X	
D. intermedia	25	22	7	7	+	+	+	+	+	+	+	(heaths)	"		1.V - 17.VIII	
Doros conopseus	13	13	8	8	.	.	+	–	+	.	+	woodland	"		27.V - 29.VI (10.VIII)	★
Epistrophe diaphana	12	9	1	8	.	.	.	.	+	+	+	xerophilous ?	"		17.VI - 11.VIII	
E. eligans	348	120	13	3	+	+	+	+	+	+	+	woodland	"		11.IV - 2.VIII (2.IX, 21.IX)	
E. euchroma	24	19	2	7	.	.	+	+	+	+	+	id.	"		13.IV - 9.VI	
E. grossulariae	101	60	11	5	+	+	+	+	+	+	+	eur	"	m	(2.V) 20.V - 21.IX	
E. melanostoma	12	11	–	8	.	.	.	+	+	+			"		14.V - 14.VI (28.VII)	
E. melanostomoides	31	18	1	7	.	–	.	+	+	+	+		"		10.V - 18.VII	
E. nitidicollis	150	71	11	5	+	+	+	+	+	+	+	woodland	"		26.IV - 26.VII (18.VIII)	
E. ochrostoma	11	11	–	8	.	.	.	+	+	+	+	xerophilous ?	"		13.V - 14.VI	
Episyrphus auricollis	240	79	16	5	+	+	+	+	+	+	+	ubiquitous	"	m	26.III - 1.XI	
E. balteatus	4541	280		1	+	+	+	+	+	+	+	id	"	M	II - XI	
E. cinctellus	332	96	7	4	+	+	+	+	+	+	+	woodland	"	(m)	18.IV - 25.IX	
Eriozona syrphoides	32	23	11	7	.	+	.	+	+	+	+	id.	"		25.V - 10.IX	
Eristalis abusivus	218	79	–	5	+	+	+	+	+	+	+	grassland ?	a		(9.IV, 11.IV) 1.V - 25.IX	
E. aeneus	87	38	7	6	+	+	+	+	+	+	+	(xerophilous)	"		20.III - 28.IX	
E. alpinus	8	9	8	8	.	.	–	.	+	.	.	bog ?	"		4.VI - 28.IX	✪
E. arbustorum	2068	284		1	+	+	+	+	+	+	.	ubiquitous	"		12.III - 31.X	
E. cryptarum	4	3	3	10	.	.	–	.	.	–	.	bog	"		12.V - 13.VI (28.VII)	✪
E. horticola	355	148	1	3	+	+	+	+	+	+	+	eur.	"		19.IV - 23.IX	
E. intricarius	399	151		3	+	+	+	+	+	+	+	(wetland)	"		(7.III) 27.III - 14.X	
E. jugorum	49	34	3	6	.	.	.	.	+	+	+		"		29.V - 17.IX (12.X)	
E. nemorum	906	194	6	2	+	+	+	+	+	+	+	eur.	"		17.IV - 10.X	
E. pertinax	2252	278		1	+	+	+	+	+	+	+	ubiquitous	"		(15.I, 23.II) 19.III - 3.XI	
E. ? piceus	191	21	–	7	.	+	+	+	+	+	+	wetlands	"		26.IV - 31.VIII	
E. pratorum	116	74	7	5	+	+	+	+	+	+	+	eur. ?	"		(15.III) 7.IV - 26.VIII (15.X)	
E. rupium	110	50	5	5	.	.	.	.	+	+	+		"		(12.IV) 7.V - 20.IX	
E. sepulcralis	559	160		3	+	+	+	+	+	+	+	eur.	"		(30.III) 25.IV - 29.IX (14.X)	
E. tenax	2347	279		1	+	+	+	+	+	+	+	ubiquitous	"	M	I - XII	
Eumerus flavitarsis	7	6	1	9	.	.	.	.	.	+	+	xerophilous	ph		5.VI - 23.VII	
E. ornatus	8	7	2	9	.	.	.	.	–	+	+	id	"		7.V - 21.VII (26.IX)	
E. sabulonum	5	7	4	9	+	.	+	–	.	–	.	id	"		28.VI - 10.VIII	★
E. sogdianus ♂♂	11	8	3	9	+	–	–	+	+	.	.	cultures, gardens	"		17.V - 11.VI ; 21.VII - 19.VIII	
E. strigatus	425	49	14	5	+	+	+	+	+	+	+	id	"		4.V - 26.IX	
E. tarsalis	2	2	2	10	.	.	.	–	–	.	.		"		30.VI, 30.VII	✪
E. tricolor	15	10	4	8	.	.	.	–	+	+	–	chalk grassland	"		4.V - 7.VII	
E. tuberculatus	48	20	2	7	+	+	.	+	+	+	.	(cultures)	"		20.V - 18.VII ; 31.VII - 8.IX	
Ferdinandea cuprea	180	67	8	5	.	+	+	+	+	+	+	woodland	S		(12.IV, 19.IV) 2.V - 14.IX (1.X)	
F. ruficornis	4	5	2	9	.	–	.	+	.	+	–		S		7.V - 20.VII	
Helophilus hybridus	64	34	3	6	+	+	+	+	+	+	+	eur.	a		2.V - 14.IX	
H. pendulus	2492	230		1	+	+	+	+	+	+	+	eur.	.		26.III - 27.X (13.XI, 17.XI, 13.XII)	
H. trivittatus	530	170		3	+	+	+	+	+	+	+	ubiquitous	"	m	12.IV - 15.X	
Heringia heringi	25	20	7	7	+	+	.	+	+	.	–	xerophilous	C		6.V - 12.VIII	
H. senilis	7	3	–	10	+	.	.	.	+	.	.	id.	v		7.V - 13.VI	
Ischyrosyrphus glaucius	194	92	16	4	.	+	+	+	+	+	+	woodland	"		(22.IV - 16.VI) 25.VI - 16.IX	
I. laternarius	91	47	11	6	.	+	.	+	+	+	+	id	"		12.VI - 29.VIII (17.IX)	
Lejogaster metallina	185	92	22	4	+	+	+	+	+	+	+	wetl., humid grass	a		(13.IV) 1.V - 16.IX	
L. splendida	19	15	3	8	+	+	+	+	.	+	.	wetlands	"		16.V - 30.VIII	
Lejops vittata	4	5	4	9	+	+	.	.	.	.	.	salt marshes	"		15.V - 27.VIII	✪
Leucozona lucorum	265	117	7	4	.	+	+	+	+	+	+	(humid forest)	C		(20.IV) 1.V - 26.VIII	
Mallota cimbiciformis	(1)	1	1	10	.	.	.	–	.	.	.		W		?	
M. fuciformis	5	7	6	9	.	+	–	–	–	.	.	carr, hedgerows	W		7.IV - 7.V	✪
Megasyrphus annulipes	74	34	2	6	.	+	+	+	+	+	+	woodland	C		(13.IV) 1.V - 10.IX	
Melangyna barbifrons	3	3	2	10	.	.	.	+	.	+	.	id.	"		2.IV - 7.V	
M. cincta	100	57	12	5	+	+	+	+	+	+	+	id.	"	m	17.IV - 16.IX	
M. compositarum	5	3	–	10	.	.	.	.	.	+	+	id.	"		30.VI - 2.VIII	
M. guttata	21	15	4	8	+	+	+	+	+	.	.	eur.	"		16.V - 18.IX	

Table 1 (3)

	FREQUENCY				DISTRIBUTION							HABITAT(S)			FLIGHT PERIOD	threatened species
	total number of records	total number of U.T.M.-squares	n. of U.T.M.-sq.s before 1980 only	frequency class	Maritime Distr.	Vlaams Distr.	Kempen D.	Brabants D	District Maasn	D. Ardennais	D. Lorrain	adult flies	larval type	migrants		
Melangyna labiatarum	18	14	1	8	.	.	.	.	+	+	+	woodland	c		31.V - 1.IX	
M. lasiophthalma	25	16	2	7	+	+	+	+	.	+	.	id.	"		15.III - 29.V	
M. quadrimaculata	16	6	2	9	.	+	.	+	.	.	.	id.	"		4.III - 3.IV (15.IV, 26.IV)	
M. triangulifera	17	15	1	8	.	+	+	+	+	+	.	id	"		16.IV - 16.VIII	
M. umbellatarum	57	36	10	6	+	+	.	+	+	+	+	id	"		15.IV - 13.IX	
Melanostoma mellinum	2775	230		1	+	+	+	+	+	+	+	ubiquitous	"	M	1.IV - 14.X (6.XI, 17.XI)	
M. scalare	890	181		2	+	+	+	+	+	+	+	(woodland)	"		7.IV - 1.XI	
Meroclon aeneus	2	1	-	10	.	.	.	.	+	.	.	dry grassland	ph		24.VI, 30.VI	
M. avidus	4	4	2	9	.	+	.	−	.	.	+		"		19.VI - 22.VII	
M. equestris	314	113	4	4	+	+	+	+	+	+	+	(gardens)	"		4.V - 25.VIII (18.IX, 20.IX)	
M. ruficornis	3	3	1	10	.	.	+	.	.	+	.		"		18.V, 19.V; 28.VII	
M. rufus	13	2	1	10	.	.	.	.	+	.	.	dry grassland	"		11.V - 10.VII	
Metasyrphus corollae	2031	194		2	+	+	+	+	+	+	+	ubiq., cultures	ç	M	(21.III) 4.IV - 23.X	
M. lapponicus	52	30	3	6	−	+	.	+	+	+	+	woodland ?	"	m	(6.IV) 21.IV - 29.VIII	
M. latifasciatus	280	72	12	5	+	+	+	+	+	+	+	eur.	"	m	15.IV - 3.X	
M. latilunulatus	26	20	1	7	+	+	+	+	+	+	+	grassland ?	"		30.IV - 22.IX	
M. luniger	202	94	11	4	+	+	+	+	+	+	+	eur.	"	M	12.IV - 4.XI	
M. nielseni	6	3	-	10	.	.	.	.	.	+	.		"		6.VII - 12.VIII	
M. nitens	14	11	1	8	.	.	.	.	+	+	+		"		2.VI - 1.IX	
Microdon devius	35	24	14	7	.	−	.	+	+	+	+	woodland	n		(6.V) 23.V - 3.VIII	
M. eggeri	51	32	6	6	+	.	+	+	+	+	+	id	n		14.V - 27.VII	
M. mutabilis	13	13	9	8	.	.	+	+	+	+	+	id	n		14.V - 7.VII	☆
Myathropa florea	1277	233		1	+	+	+	+	+	+	+	eur., (hedgerows)	a		(10.III, 30.III) 10.IV - 26.X	
Myolepta luteola	3	3	2	10	.	.	.	+	.	.	.		w		15.VI - 13.VIII	
M. vara	3	3	2	10	.	−	.	+	.	.	+		w		2.VI - 26.VI	
Neoascia aenea	180	39	11	6	+	+	+	+	+	+	+	wetlands	a		21.IV - ?.IX	
N. dispar	1266	83	15	4	+	+	+	+	+	+	+	id.	"		20.IV - 28.IX	
N. floralis	2	7	-	10	.	.	.	.	.	+	.		"		26.V, 6.VI	
N. geniculata	56	11	6	8	+	+	.	−	+	.	.	id.	"		25.IV - 6.IX	
N. interrupta	10	5	-	9	+	.	.	+	+	.	.	id.	"		4.VI - 2.X	
N. obliqua	11	8	1	9	.	.	.	+	+	+	.	id	"		4.V - 22.VII	
N. podagrica	1130	181	8	2	+	+	+	+	+	+	+	eur.	"		26.III - 19.X	
N. unifasciata	1	1	-	10	.	.	.	.	.	+	.		"		4.VI	
Neocnemodon brevidens ♂♂	25	12	4	8	+	+	.	+	.	.	.	woodland	c		6.V - 7.IX	
N. latitarsis ♂♂	5	3	-	10	+	.	+	+	.	.	.		"		9.V - 11.VIII	
N. pubescens ♂♂	24	15	2	8	+	+	.	+	−	+	+	woodland	"		18.IV - 17.VI	
N. vitripennis ♂♂	65	34	8	6	+	+	+	+	+	+	.	woods, gardens	"		6.V - 17.IX	
Olbiosyrphus laetus	1	1	-	10	.	.	.	.	.	+	.	woodland	?		13.VII	
Orthonevra brevicornis	39	17	3	7	.	.	−	+	+	+	.	woods, orchards.	a		18.IV - 10.VI	
O. elegans	5	7	5	9	.	.	.	−	.	+	.	wetlands	"		11.V - 1.VII (VIII)	✪
O. geniculata	24	16	2	7	+	+	+	+	.	+	+	id.	"		11.IV - 16.VI	
O. intermedia	2	2	2	10	.	−	−	.	.	.	.	id.	"		24.VI, 3.VIII	✪
O. nobilis	49	41	13	6	.	.	+	+	+	+	+	eur.	"		18.V - 27.VIII	
O. splendens	94	27	9	6	+	+	.	+	+	+	.	eur., (humid forest)	"		6.V - 1.VII; 13.VII - 8.X	
Paragus albifrons	6	3	1	10	.	.	.	.	+	+	.	xerophilous	c.		1.VI - 27.VII	
P. bicolor	2	2	2	10	.	.	−	.	−	.	.	id.	"		7.VI, 10.VII	
P. finitimus	5	7	3	9	.	−	+	.	+	+	+	id.	"		17.V - 23.VIII	
P. flammeus	2	1	1	10	.	.	.	.	−	.	.	id.	"		15.VIII, 26.VIII	
P. haemorrhous	80	48	21	6	+	+	+	+	+	+	+	id.	"		6.V - 21.IX	
P. majoranae	9	7	3	9	+	.	−	+	+	+	+		"		14.V - 22.VIII	
P. tibialis ♂♂	4	3	1	10	+	.	−	.	.	.	+	(sand dunes)	"		11.VII - 16.VIII	
Parasyrphus annulatus	41	25	7	6	.	.	+	+	+	+	+	woodland	c	(m)	(27.IV) 26.V - 28.VIII	
P. lineola	205	51	2	5	.	.	+	+	+	+	+	id.	"	m	22.IV - 25.IX	
P. macularis	17	9	-	8	.	.	.	.	.	+	+		"		7.V - 8.VII	
P. malinellus	41	27	3	6	.	+	+	+	+	+	.		"		1.V - 11.VII	
P. nigritarsis	3	4	-	9	+	+	.	+	.	.	.		"		6.V, 17.V, 18.V	
P. punctulatus	90	47	6	6	+	+	+	+	+	+	+	conifer woods	"		(16.III) 7.IV - 7.VII	
P. vittiger	36	26	4	6	.	.	+	+	+	+	+	woodland	"	(m)	(7.IV) 7.V - 8.IX	
Parhelophilus consimilis	1	2	2	10	.	−	−	.	.	.	.	bogs	a		1.VI	✪
P. frutetorum	42	22	8	7	+	−	+	+	−	+	+	marsh, humid for.	"		13.V - 30.VII (1.IX)	
P. versicolor	43	18	6	7	+	+	+	+	+	+	+	id.	"		12.V - 3.IX	
Pelecocera tricincta	10	8	6	9	.	−	+	.	.	.	+	xerophilous	?		1.VII - 21.IX	☆
Pipiza austriaca	70	44	11	6	+	−	+	+	+	+	+	woodland	c		8.V - 13.VII; 2.VIII - 19.IX	
P. bimaculata	50	39	6	6	+	+	+	+	+	+	+	id.	"		3.V - 23.VII; 12.VIII - 22.VIII	
P. fenestrata	15	13	4	8	+	−	.	+	+	+	+	id.	"		18.IV - 31.V; 1.VIII - 22.VIII	
P. festiva	10	11	1	8	+	.	.	+	−	.	.	xerophilous	"		11.V - 13.VI; 26.VIII - 30.VIII	
P. lugubris	70	31	13	6	+	−	+	+	+	+	+	woodland	"		8.V - 6.VII; 25.VII - 24.IX	
P. luteitarsis		4	-	9	.	.	.	+	+	+	.	xerophilous	"		10.V - 30.V	
P. noctiluca	113	70	18	5	+	+	+	+	+	+	+	woodland	"		1.V - 6.VI; 21.VII - 8.IX	
P. notata	9	6	1	9	.	−	.	.	.	+	+	id.	"		20.V - 20.VI	
P. quadrimaculata	83	47	6	6	.	.	+	+	+	+	+	humid woodland	"		10.V - 8.VII; 26.VII - 12.VIII	
P. signata	11	5	-	9	.	−	+	+	.	+	.	woodland	"		13.V - 2.VII; 10.VIII - 19.IX	
Pipizella annulata ♂♂	14	12	5	8	.	.	.	+	+	−	+	xerophilous ?	"		30.V - 4.VIII	
P. divicoi ♂♂	6	4	1	9	.	.	.	+	+	.	.	dry (chalk) grassl.	"		16.V - 21.VI	
P. maculipennis ♂	1	1	-	10	+	.	.	.	.	.	.		"		12.VI	
P. varipes ♂♂	234	95	18	4	+	+	+	+	+	+	+	eur.	"		4.V - 30.VIII (20.IX)	
P. virens ♂♂	72	36	17	6	+	+	+	+	+	−	+	deciduous woods	"		6.V - 29.VIII (14.X)	
P. zanneggenensis ♂♂	4	3	1	10	.	.	.	+	+	.	.	xerophilous ?	"		21.V, 6.VI, 13.VI	
Pipizella nov. sp. ♂	1	1	-	10	.	+	.	.	.	.	.		"		17.VI	

Table 1 (4)

	FREQUENCY				DISTRIBUTION							HABITAT(S)			FLIGHT PERIOD	
	total number of records	total number of UTM-sq.s	n. of UTM-sq.s before 1950 only	frequency class	Maritime Distr.	Vlaams District	Kempen D.	Brabantse D.	District Maasn	D. Ardennais	D. Lorrain	adult flies	larval type	migrants		threatened sp.
Platycheirus albimanus	1511	206	.	2	+	+	+	+	+	+	+	eur. (wooded sites)	c	m	(23.III) 4.IV - 1.XI	
P. ambiguus	15	10	4	8	+	+	+	+	+	+	.	deciduous woodland	"		8.IV - 25.V	
P. angustatus	438	107		4	+	+	+	+	+	+	+	grassland	"		13.IV - 20.IX	
P. clypeatus	1208	238		1	+	+	+	+	+	+	+	id.	"		1.IV - 27.IX	
P. discimanus	7	6	4	9	.	+	.	—	.	+	.	deciduous woodland	"		9.IV - 7.V	
P. fulviventris	92	46	5	6	+	+	+	+	+	+	+	humid grassland	"		27.IV - 20.IX	
P. immarginatus	5	4	_	9	+	.	.	.	.	.	.	salt marshes, sea polder	"		17.V, 27.V; 2.VIII, 12.VIII	
P. manicatus	277	96	13	4	+	—	.	+	+	+	+	eur.	"	M	11.IV - 16.X	
P. ovalis	74	44	1	6	.	+	.	+	+	+	+	woodland	"		18.IV - 3.VII (13.VIII, 19.VIII)	
P. peltatus	2047	207		2	+	+	+	+	+	+	+	eur.	"		29.III - 26.X	
P. perpallidus	7	8	5	9	.	+	+	.	—	.	.	wetlands	"		12.V - 13.VIII	☆
P. scambus	129	65	8	5	+	+	+	+	+	+	+	id.	"		8.V - 12.IX	
P. scutatus	869	159	3	3	+	+	+	+	+	+	+	ubiquitous	"		3.IV - 1.XI	
P. sticticus	1	1	1	10	.	.	.	.	—	.	.		"		21.IV	
P. tarsalis	23	15	_	8	.	+	+	.	+	+	.	woodland	"		4.IV - 3.VI	
Pocota personata	1	2	1	10	.	—	.	+	.	.	.	hedgerows	w		15.IV	
Psarus abdominalis	3	7	7	9	.	.	—	.	—	.	.	xerophilous?	?		31.V - 8.VIII	✪
Pyrophaena granditarsa	412	120	1	4	+	+	+	+	+	+	+	(humid) grassland	c		3.V - 26.IX	
P. rosarum	204	82	18	4	+	+	+	+	+	+	+	marsh, humid forest	c		(17.IV) 3.V - 16.IX	
Rhingia campestris	4407	301		1	+	+	+	+	+	+	+	ubiq., (pastures)	d		15.III - 2.XI	
R. rostrata	5	7	7	9	.	.	.	—	—	—	—		?		26.IV - 5.IX	✪
Scaeva pyrastri	940	222	13	1	+	+	+	+	+	+	+	ubiquitous	c	M	(2.II) 30.III - 8.X (15.XI)	
S. selenitica	253	103	9	4	+	+	+	+	+	+	+	id.	c	M	30.III - 16.IX	
Sericomyia lappona	99	36	3	6	.	.	+	+	+	+	+	wetlands	a		1.V - 16.IX	
S. silentis	317	84	9	4	.	+	+	+	+	+	+	id.	a		18.V - 13.X	
Sphaerophoria abbreviata ♂♂	121	19	7	7	+	.	+	+	—	+	—	(heaths, bogs)	c		1.V - 26.VIII	
S. batava ♂♂	63	22	5	7	.	+	+	—	+	+	+	(heaths)	"		8.V - 3.IX	
S. loewi	1	2	1	10	.	.	.	+	.	.	.	reed marsh	"		3.VII	
S. menthastri ♂♂	187	43	17	6	.	+	+	—	+	+	+	humid grassland	"		(13.IV) 10.V - 15.IX	☆
S. philantus ♂♂	23	17	7	7	.	.	+	+	.	+	+	heaths	"		9.V - 31.VIII	
S. rueppelli	58	22	5	7	+	+	+	+	.	+	.	(ruderal sites), xer.?	"		10 V - 29 IX	
S. scripta	2018	228	19	1	+	+	+	+	+	+	+	ubiquitous	"	M	(15.III, 23.III) 7.IV - 5.XI	
S. taeniata ♂♂	82	61	20	5	.	+	+	+	+	+	+	grassland, heaths	"		21.IV - 18.IX	
S. virgata ♂♂	48	27	10	6	—	+	+	+	+	+	+	id.	"		8.V - 9.IX	
Sphegina clunipes	101	72	9	5	.	.	.	+	+	+	+	wooded wetlands	w		26.IV - 9.IX	
S. kimakoviczi	37	28	2	6	.	.	.	+	+	+	+	id	"		8.V - 30.VIII	
S. nigra	20	8	_	9	.	.	.	+	+	+	+	id	"		7.VI - 28.VIII	
S. sibirica	7	3	_	10	.	.	.	.	.	+	.	id.	"		24.VI - 8.VII	
Sphiximorpha subsessilis	7	7	3	9	.	.	+	+	.	.	.	deciduous forest	s		18.V - 23.VI	
Spilomyia saltuum	1	1	1	10	.	.	.	.	—	.	.		w		18.VIII	
Syritta pipiens	1338	239		1	+	+	+	+	+	+	+	ubiquitous	d		26.III - 1.XI (5.XII)	
Syrphus nitidifrons	2	2	_	10	.	.	.	.	+	+	.	xerophilous?	c		19.VI	
S. ribesii	1435	226	12	1	+	+	+	+	+	+	+	ubiquitous	"	m	15.III - 23.X (15.XI)	
S. torvus	584	148	9	3	+	+	+	+	+	+	+	(wooded sites)	"	M	(16.III) 3.IV - 17.X	
S. vitripennis	1012	203	10	2	+	+	+	+	+	+	+	ubiquitous	"	M	(9.I; 5.II) 29.III - 2.XI (21.XI)	
Temnostoma apiforme	9	7	1	9	.	.	.	.	+	+	+	xerophilous?	w		9.V - 10.VII	
T. bombylans	84	47	5	6	.	+	+	+	+	+	+	woodland, orchards,	"		(10.IV, 27.IV) 12.V - 18.VII	
T. vespiforme	90	53	6	5	.	.	+	+	+	+	+	id.	"		(12.IV) 26.V - 28.VII	
Trichopsomyia carbonaria ♀♀	3	4	1	9	.	.	.	.	.	+	.		c?		16.VI - 8.VII	
T. flavitarse	19	17	5	7	+	+	+	.	+	+	+	wooded sites nr. bogs	c		12.V - 23.VIII	
T. lucida	23	7	2	9	.	+	.	+	.	+	.	deciduous forest	c		26.V - 20.VIII	
Tropidia fasciata	2	2	2	10	.	.	.	.	.	—	.	dry grassland?	d?		10.VI; 18.VIII	✪
T. scita	393	63	5	5	+	+	+	+	.	.	.	wetlands, hum. grassl.	d		11.V - 27.VIII (15.IX, 19.IX)	
Volucella bombylans	631	191	8	2	+	+	+	+	+	+	+	woodland	n		(21.IV, 24.IV) 8.V - 2.IX (21.IX, 17.X)	
V. inanis	41	32	13	6	.	.	.	.	+	+	+	id	"		11.VI - 12.IX	
V. inflata	18	16	7	7	.	.	—	.	+	+	—	id	"		21.V - 26.VII	
V. pellucens	654	191	11	2	+	+	+	+	+	+	+	id	"		(9.IV, 13.IV) 6.V - 28.IX	
V. zonaria	88	55	20	5	+	+	+	+	+	_	+	eur.	"	m	15.V - 23.IX	
Xanthandrus comtus	48	32	17	6	+	+	+	+	—	+	+	id.	c	(m)	16.V - 2.X	★
Xanthogramma citrofasciatum	121	63	11	5	.	+	.	+	+	+	+	wooded sites, xer.?	c?		(2.IV) 21.IV - 23.VI (15.VIII, 18.VIII)	
X. pedissequum	235	100	14	4	+	+	+	+	+	+	+	wooded sites	c?		15.V - 23.IX	
Xylota abiens	36	28	9	6	.	+	+	+	+	+	+	woodland	w		7.V - 26.VIII	
X. coeruleiventris	48	20	2	7	.	.	.	.	+	+	+	id. (hill country)	"		3.VI - 23.VIII	
X. curvipes	1	1	1	10	.	.	.	.	.	—	.	?	"		5.VI	
X. femorata	11	10	3	8	.	.	.	.	—	+	+	humid forest	"		15.V - 6.VIII	
X. florum	120	52	9	5	.	+	+	+	+	+	+	woodland	"		22.V - 2.IX (16.IX)	
X. ignava	15	12	4	8	.	.	.	.	—	+	.		"		8.VI - 29.VII	
X. lenta	102	52	7	5	+	+	+	+	+	+	+	deciduous woodland	"		8.V - 15.VII (28.VII; 3, 9.VIII; 15.X)	
X. meigeniana	37	16	2	7	.	.	+	+	+	+	.	id	"		13.VI - 22.VIII	
X. nemorum	112	34	2	6	+	+	+	+	+	+	+	(humid woodland)	"		19.IV - 14.IX	
X. pigra	4	4	2	9	.	.	.	.	—	+	.		"		16.V - 11.VI	
X. segnis	1290	209	4	2	+	+	+	+	+	+	+	eur.	"		(29.III, 2.IV) 15.IV - 2.XI	
X. sylvarum	298	103	8	4	+	+	+	+	+	+	+	humid deciduous for.	"		2.V - 21.IX	
X. tarda	51	16	1	7	.	.	+	+	+	+	+	id.	"		31.V - 2.IX (25.IX)	
X. xanthocnema	37	13	3	8	.	.	.	+	+	+	+	id.	"		29.V - 25.VIII	
Triglyphus primus	33	14	6	8	+	+	.	+	+	.	.	xer., (ruderal sites)	c		(30.V); 21.VI - 8.IX	

5. ZOOGEOGRAPHY

5.1. INTRODUCTION :

Belgium is a tiny country, yet it is quite interesting from a zoogeographical point of view. Conditions of soil and climate are - in contrast with the relative homogeneity of NL, e.g. - highly complex, and this situation is reflected by the complexity of the composition and distribution of our entomofauna. The situation of our country in an area of north-western Europe, where northern and southern, maritime and continental fauna elements meet no doubt explains the relative richness of our entomofauna. Our Syrphid fauna is no exception to this. 314 species is quite a large number. We have nearly 60 species more than the British Isles. The Dutch hoverfly fauna is not much smaller, but it must not be forgotten that about one tenth of the Dutch hoverflies are restricted to a tiny part of the territory, the southernmost tip of South Limburg. The richness of our hoverfly fauna is best appreciated when compared with large neighbouring countries like France and West-Germany. In both these countries there is large Alpine element ; in D the northern element is well-represented, in F there are a number of Mediterranean species. Yet they have only about 30 % more species. This figures compares favourably with what we know about other insect families. So, e.g. the Sphecidae : In B 171 species have been recorded against 392 in F !

Zoogeographically speaking Syrphidae are a particularly interesting insect family : apart from a number of common or ubiquitous species and some migrants their distribution over the country is quite uneven. The majority of our hoverflies are restricted either to certain parts of the country and even within their range they hardly ever leave certain habitats. This is connected with a number of specific ecological and physiological factors. It may be useful for the general reader to give a brief summary of these factors, though for greater detail we must refer to the general literature : VdG81, BARENDREGT 1982, STUBBS 1983, who introduce the subject more fully than can be done in this context.

5.2. PHYSICAL FACTORS INFLUENCING GEOGRAPHICAL DISTRIBUTION OF THE SPECIES :

5.2.1. Field experiments have demonstrated that a species is normally only active when conditions are suitable : temperature, air humidity and light intensity have to be right. Right means : within certain limits. Now these vary from species to species. Some show a very great tolerance : an extreme example is Episyrphus balteatus, which can be seen in any environment and remains active when it has become too hot or too cool for most other hoverflies ; it even continues foraging in light rain. Obviously such species are hardly limited in their range by the said factors : their great tolerance towards them allow them to survive practically anywhere.

Most species, however, are far more sensitive to climatic conditions. This does not only condemn them to inactivity when the weather is unsuitable, it also restricts their mobility. Thus most hoverfly species are apparently geared to moderate and temperate climatic conditions and only thrive in habitats where such circumstances prevail : this is why woods and wetlands are particularly rich in hoverflies. Extreme heat and drought hardly penetrate here. There are of course different degrees of tolerance. Many woodland species can be seen away from their favourite habitat ; except in spring there are few flowers inside the forest. They forage in clearings and along the edges or even some distance away, but few of them will travel far.

A number of species have been able to occupy certain niches by adapting to more extreme environments. Sphegina and Baccha live in damp shady places : food is rather scarce there, but this is compensated by the absence of competitors. At the other end of the scale there are the xerophilous species. Greater tolerance towards direct sunlight, heat and drought enable many Paragus, Pipizella, Merodon, Eumerus, ... to settle in exposed sites like sand dunes, dry heaths, chalk or limestone grassland.

Climatic factors surely play a part, too, in determining the distribution of our hoverflies on a macro-level, i.e. their range within the country. It will be seen that only a minority are generally distributed over the entire territory. The absence of many species in the western half of B may be due in part to the lack of suitable habitats ; it is, for instance, less wooded and especially ancient forests on fertile soil are hardly found there. Nevertheless the climatic circumstances that prevail near the sea must have some influence. Greater humidity, stronger winds, lower summer temperatures, ... these factors may explain why even many common species like Eristalis nemorum and E. horticola, Cheilosia impressa and C. variabilis become extremely rare near the coast.

Specific tolerance degrees do not only result in segregation in space, they also entail segregation in time, in other words they are determinating factors for the phenology of the species. By adapting to low temperatures species like Cheilosia grossa, Melangyna quadrimaculata, Criorhina ranunculi

and many more are able to exploit the abundant food sources available then. Competition from other hoverflies is largely avoided that way, at the risk, however that the species is liable to be decimated by a succession of cold and wet springs.

5.2.2. So far for the relationship between adult hoverflies and their physical environment. The availability of suitable habitats for the development of the larvae must play a part, too, in determining spacial segregation. For the species with carnivorous larvae (the Syrphini, Bacchini and Pipizini) this is not so obvious, unless their larvae depend on specific animal preys, which may in their turn be linked with certainhabitats. Little seems to be known about this. The Eristalini, whose larvae develop in polluted liquid, will have no difficulty in this respect, either, though some of the rarer Eristalis may be so scarce, because their larvae can only survive in specific aquatic environments.

The many hoverfly species, whose larvae develop in rotting or mouldering wood, in the sap flowing from tree wounds, in the stems and roots of certain woodland plants or in woodland fungi, need at least the proximity of woodland for their procreation. They could hardly survive in our treeless sea-polders or in the contemporary agrarian steppes.

5.3. Even when the distribution map of a certain species shows a definite pattern it is not always possible to find an explanation that is wholly satisfactory. It is obvious that Cheilosia fasciata and C. maculata, depending as they do on the food plant for their larvae, Allium ursinum, cannot extend their range beyond the area where Allium can grow. It is also evident why Anasimyia species are commoner in the north than in the rest of the country : they are confined to the proximity of ponds and other stagnant surface waters, and that type of habitat is scarce in the centre and the south of the country. But why are most Chrysotoxum, Parasyrphus and Microdon confined to the eastern half of the country? Quite a number of species do not penetrate beyond a line running from Antwerpen to the point where the Sambre enters Belgium. Yet this line does not correspond with any isotherm or isobar or any other line in climat maps. As BARENDREGT (1982) points out - when discussing the range limit of Eristalis anthophorinus in NL - a complex of factors must be involved here. Problems of this kind may get solved when sufficient detailed information becomes available. General climatical conditions, like annual rainfall, average summer and winter temperature, the frequency and severity of (night) frosts, snow cover, average air humidity, ... may be involved to some extent. So do other physical factors like the nature of the soil, altitude, exposure, etc.

These are all factors that influence flora and vegetation, too. As the distribution of higher plant species is accurately known and the country has been divided into phytogeographical districts it might be useful to examine the hoverfly populations of the different phytogeographical districts. In any case it will make more sense than the commonly used administrative units (province, county, département, canton, oblast, etc. often form the limit of local surveys). In a number of cases the range limits of certain hoverflies correspond with the limits of some phytogeographical districts, particularly the northern borders of the Brabant and the Mosan districts.

There is a snag, however : the delineations of the phytogeographical districts are roughly parallel : they run from (south-)west to (north)-east, roughly speaking. Very often the range limit of a hoverfly species runs north-south. The correlations will have to be studied with the help of a computer and before this can be done more information will be needed also from adjacent foreign parts. Meantime we though it useful to add a brief description of our phytogeographical districts and their respective hoverfly fauna (Appendix 3).

5.4. TYPICAL DISTRIBUTION PATTERNS :

When comparing the specific distribution maps (1 - 314) typical patterns started to emerge. In the end 12 patterns have been retained : fig. 1 shows their outlines. They can be divided into 4 groups, with 3 variants each.

A. Generally distributed species :

Pattern 1 : Frequent to very common or ubiquitous species occurring all over the country and probably to be found in each U.T.M.-square. Some appear equally numerous everywhere, others occur in greater number in some part(s) of the country than elsewhere.

Pattern 2 : Species known from (nearly) all phytogeographical districts, but infrequent or rather rare, obviously absent from many squares.

Pattern 3 : Frequent species generally distributed over the whole territory except the north-west, i.e. shunning the proximity of the sea.

B. Species with an eastern distribution :

Pattern 4 : Species occurring all over the eastern half of the country, i.e. east of line running (roughly) from Antwerpen to the south. This borderline varies somewhat from species to species ; it may run a bit more to the west, more often further east.

Pattern 5 : The same as pattern 4, except that the species is not known from the northern part of this eastern half. There are no records for the Kempen District.

Pattern 6 : Species limited to the south-east, in some cases to the extreme south-east only. Among these there are a number of species that are only known from the Hautes Fagnes and adjacent high plateaux.

C. Species with a southern distribution :

Pattern 7 : Species which are (fairly) frequent south of the Sambre-Meuse valley, but occur (or used to occur) in smaller numbers or only quite locally in the central low plateaux of the Brabant District.

Pattern 8 : (Fairly) frequent species occurring only in the south, i.e. from the French border up to the northern banks of the Sambre and Meuse.

Pattern 9 : Infrequent to rare species with the same range as the former, but occurring only locally, usually in places with a warm micro-climate, on chalk or limestone.

D. Species with a northern distribution :

Pattern 10 : Species recorded only from the Maritime District, the sea-dunes and the adjacent sea-polders, as well as the banks of the River Schelde near Antwerpen.

Pattern 11 : Species restricted to the extreme north, i.e. the low plains below the 50 m contour-line.

Pattern 12 : Species occurring from the northern (Dutch) border up to the Sambre-Meuse valley. They are generally more frequent in the plains than in the central low plateaux. A few of them occur very locally in the south.

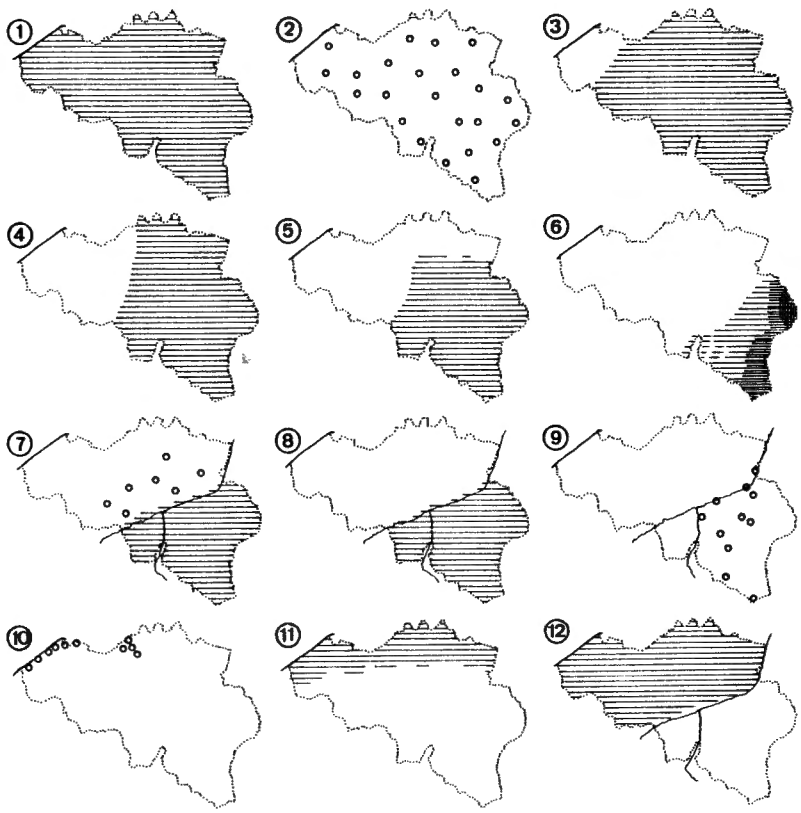


Fig. 1 : Distribution patterns

5.5. DISTRIBUTION PATTERNS : SPECIES LISTS

PATTERN 1 : Species which are more numerous in the north (N), centre (C) or south (S) are marked accordingly. Those that are much rarer in the north-west are followed by °

Baccha elongata, Cheilosia albipila °, C. albitarsis, C. fraterna °, C. mutabilis, C. pagana, C. variabilis °, C. vernalis, Chrysogaster hirtella, C. solstitialis°, C. viduata, Chrysotoxum bicinctum °, Criorhina berberina, Dasysyrphus hilaris °, D. lunulatus °, D. tricinctus °, D. venustus, Didea fasciata, Epistrophe eligans, E. grossulariae°, E. nitidicollis °, Episyrphus auricollis, E. balteatus, E. cinctellus (S)°, Eristalis abusivus (N), E. arbustorum, E. intricarius (N), E. nemorum °, E. pertinax, E. pratorum, E. sepulchralis (N), E. tenax, Eumerus strigatus, Ferdinandea cuprea °, Helophilus pendulus (N,C), H. trivittatus, Ischyrosyrphus glaucius (S) °, I. laternarius (S) °, Lejogaster metallina, Melangyna cincta, M. umbellatarum °, Melanostoma mellinum, M. scalare, Merodon equestris, Metasyrphus corollae, M. latifasciatus, M. luniger °, Myathropa florea, Neoascia aenea, N. dispar, N. podagrica, Neocnemodon vitripennis, Paragus haemorrhous (on sandy soils)°, Parasyrphus punctulatus, Pipiza lugubris (C,S), P. noctiluca, Pipizella varipes, Platycheirus albimanus, P. angustatus, P. clypeatus, P. manicatus, P. peltatus, P. scambus (N), P. scutatus, Pyrophaena granditarsa, Rhingia campestris, Scaeva pyrastri, S. selenitica, Sericomyia silentis (S), Sphaerophoria scripta, S. taeniata °, Syritta pipiens, Syrphus ribesii, S. torvus, S. vitripennis, Volucella bombylans, V. pellucens, V. zonaria, Xanthogramma pedissequum, Xylota florum °, X. lenta, X. nemorum °, X. segnis, X. sylvarum, probably also : Anasimyia lineata, Helophilus hybridus (N), Platycheirus fulviventris (N), Temnostoma bombylans °.

PATTERN 2 :

Brachyopa bicolor (?), B. scutellaris (?), B. pilosa (?), Cheilosia argentifrons (?), C. bergenstammi, C. cynocephala (?), C. grossa, C. intonsa, C. praecox, C. velutina, Criorhina asilica, C. floccosa (?), Didea intermedia, Eumerus tuberculatus, E. sogdianus (?), Heringia heringi, Melangyna lasiophthalma, Metasyrphus lapponicus, M. latilunulatus, Neoascia geniculata (N), Neocnemodon pubescens, Pipiza fenestrata, Platycheirus ambiguus, Sphaerophoria virgata, Triglyphus primus, Xanthandrus comtus.

PATTERN 3 : Species marked (+) have been recorded from the north-west, but so rarely, that they might have been strays.

Brachypalpus laphriformis, Ceriana conopsoides, Cheilosia carbonaria, C. impressa (+), C. scutellata, Chrysotoxum cautum (+), Eristalis horticola (+), Leucozona lucorum, Parhelophilus frutetorum, P. versicolor, Pipiza austriaca, P. quadrimaculata (+), Pipizella virens, Platycheirus tarsalis, Pyrophaena rosarum (+), Sphaerophoria abbreviata, S. batava, S. menthastri, Sphegina clunipes (+), Xanthogramma citrofasciatum (C,S), Xylota abiens.

PATTERN 4 :

Cheilosia canicularis, C. chlorus, C. chrysocoma, C. longula, Chrysotoxum arcuatum, C. elegans, C. festivum, C. octomaculatum, C. vernale (?), Doros conopseus, Epistrophe euchroma,Eristalis alpinus, E. ? piceus (?), Megasyrphus annulipes, Melangyna triangulifera, Microdon devius, M. eggeri, M. mutabilis, Paragus majoranae, Parasyrphus annulatus, P. lineola, P. vittiger, Pipiza bimaculata, Sphaerophoria philantus, Temnostoma vespiforme, Xylota tarda, X. meigeniana, Parasyrphus malinellus.

PATTERN 5 :

Brachyopa testacea, B. insensilis (?), Caliprobola speciosa, Cheilosia antiqua, C. fasciata, C. honesta, C. illustrata, C. lenis, C. maculata, C. nasutula, C. nigripes, C. proxima, C. ruficollis (?), C. rufimana, C. semifasciata, Chrysogaster chalybeata, C. virescens, Criorhina ranunculi (?), Chrysotoxum intermedium, C. verralli (?), Dasysyrphus friuliensis (S), Didea alneti (S), Epistrophe melanostoma, E. melanostomoides, E. ochrostoma, Eristalis rupium (S), Eumerus ornatus, Neoascia obliqua, Orthonevra brevicornis, O. elegans, O. nobilis (S), Psarus abdominalis, Sericomyia lappona (S), Sphegina kimakowiczi, S. nigra, Volucella inflata (S), Xylota xanthocnema ; Platycheirus ovalis (except for a single record from the north-west : see also specific part)

PATTERN 6 :

Blera fallax, Brachyopa vittata, Cheilosia frontalis, Eristalis jugorum, Melangyna compositarum, M. labiatarum, Parasyrphus macularis, Sphegina sibirica, Trichopsomyia carbonaria (?), Xylota femorata, X. ignava, X. curvipes (?) ; proba bly also Epistrophe diaphana, Eumerus flavitarsis, Brachyopa panzeri.

PATTERN 7 :

Arctophila bombiformis, A. fulva, Cheilosia barbata, C. flavipes, C. pubera, C. vulpina, Eriozona syrphoides, Eumerus tricolor, Volucella inanis.

PATTERN 8 :

Cheilosia soror, Metasyrphus nitens, Pipizella annulata, Syrphus nitidifrons (?)

PATTERN 9 :

Merodon aeneus, M. rufus, Paragus albifrons (?), Pipiza lutei tarsis, Pipizella divicoi, P. zeneggenensis, Rhingia rostrata (?), Temnostoma apiforme (?)

PATTERN 10 :

Lejops vittata, Platycheirus immarginatus.

PATTERN 11 :

Anasimyia lunulata (?), Chamaesyrphus lusitanicus (?), Neocnemodon latitarsis (?), Orthonevra intermedia, Parhelophilus consimilis, Platycheirus perpallidus.

PATTERN 12 : Species very occasionally taken further south are marked (+)

Anasimyia contracta (?), A. interpuncta, A. transfuga (+), Criorhina pachymera (?), Melangyna guttata (?), M. quadrimaculata (?), Lejogaster splendida (+), Neoascia interrupta, Neocnemodon brevidens, Parasyrphus nigritarsis (?), Sphaerophoria loewi (?), S. rueppelli, Tropidia scita.

5.6. DISTRIBUTION PATTERNS : REMARKS AND COMMENTS

- A considerable number of species could not be allocated to any of the above patterns, because there is not enough information. It is also suspected that a number of other species, particularly those followed by (?) in 5.5, may have to be transferred to another pattern when more information becomes available.

- There are a few species that do not fit into any of these patterns :

a) Orthonevra geniculata is limited to the northern plains and the extreme east of the country.

b) Trichopsomyia flavitarse shows a similar distribution pattern : the extreme north and the south-east. It is possible that T. flavitarse is replaced by its relative, T. lucida, in the rest of the country. Such disjunctive pattern is remarkably rare in our Syrphidae, though there are, of course, a large number of species that are known only from isolated colonies.

c) Eristalis aeneus is a special case ; it combines patterns 10 and 2. See also the text in the Specific Part.

- It should not be thought - and Syrphidae specialists are well aware of this - that the species with a northern distribution pattern represent the northern element (seen in a European context) of our hoverfly fauna. In fact there are no boreal species that are known to penetrate into this country, though 2 of these, Eristalis anthophorinus (FALLEN) and Metasyrphus lundbecki (SOOT RYEN) occur in the northern half of NL. A third northern species, Helophilus affinis WAHLBERG was recently taken in Friesland, but this may have been a stray specimen.

- Similarly, most of the species with a southern or south-eastern distribution pattern should not be thought of as southern species which reach the northern limit of their range here. Some species, like Temnostoma apiforme or Cheilosia soror, which are more numerous in southern Europe and might therefore be thought to represent the southern element of our hoverfly fauna, do in fact occur as far north as Finland. Most of the species that do not penetrate into northern Belgium and only just reach NL in South Limburg are continental or montane and Alpine species.

- The limited number of southern species that do reach the northern limit of their range here (Pipizella divicoi, P. zeneggenensis, Merodon aeneus, M. rufus, ...) are xerophilous flies which have established small colonies beyond their proper range. In this context it should perhaps be mentioned that in the famous site of Torgny (FQ.78) where a number of Mediterranean species (even Mantis religiosa !) have been taken, no exceptional hoverflies have been recorded. The site where the greatest number of southern species have been captured is some 80 km more northward : the Lesse Valley near Rochefort (FR.55)

6. RARE SPECIES

6.1. DEFINITIONS :

A section on rare species cannot be omitted, however exaggerated the attention may seem that many entomologists attach to them. Because of the low number of individuals that is involved, rarities can normally play but a very subordinate role in the ecology of their habitat. Yet the very fact that they are so seldom seen attracts attention and raises questions. All naturalists are at heart fascinated by rare species, entomologists no less than botanists or bird watchers. Spotting such a specimen is a thrilling experience even if one is well aware of its limited ecological importance.

Though it is used by everybody, the notion of "rarity" is vague, relative and subjective. Nevertheless terms like "rare", "uncommon", "infrequent", etc. are used in most of the literature, sometimes indiscriminately, without sufficient evidence, and usually without attempting to define them. VdG86 is an exception in this respect : for him species are rare when they are known only from a limited number of records over the years, and which may not be taken for many consecutive seasons by anyone (in this case any of the considerable number of Syrphidae collectors who are active in NL)

This definition is no doubt acceptable, but what if hoverflies are studied only intermittently by a limited number of dipterists ? And is rarity a uniform concept ? It is not. Within a given region species can be called rare for several reasons :

- They have a very limited range within the region, i.e. they just penetrate into it, or form a small 'island'. Examples for B : Parasyrphus macularis, Sphegina sibirica, Melangyna labiatarum all occur in a very restricted area. Within it they however, occur in number.

- They are restricted to a type of habitat which is very rare, like salt marshes, sand dunes, humid heaths, oligotrophic swamp, ...Species like Lejops vittata, Platycheirus immarginatus, Chrysogaster macquarti, Orthonevra intermedia, ... are therefore very local, though they may be very abundant in these limited areas.

- They have been able to colonise sites where exceptional climatic conditions prevail, and which may far beyond their normal range. They can maintain themselves, but cannot normally expand their local range. Obvious examples : Merodon rufus, M. aeneus, Pipizella divicoi, P. zeneggenensis, some Paragus, etc. These colonies may be few in number and far apart, but they can be populous.

- Their larvae depend on food sources or types of environment which are scarce, or have become scarce because of human activities. Comparatively little is still known, for instance, about the relation between Cheilosia species and their food plants, but it is probable that some Cheilosia are rare because the plant species on which they depend is scarce. Hoverflies feeding on outflowing sap of diseased trees or in rotting wood must have been diminishing in number because of modern forestry management. Sphaerophoria menthastri may have been drastically reduced in numbers throughout the northern half of the country by the pollution of streams and rivers.

Although these explanatory factors concern a great number of species there are still many whose scarcity cannot be explained this way. What makes Rhingia rostrata so rare whereas R. campestris prospers ? It is not likely that these problems will soon be solved. Nor is it probable that we shall find out why so many (about 50 !) species are so seldom taken that they are known from 1, 2 or 3 U.T.M.-squares only : Myolepta, some Brachypalpus, some Cheilosia, all Callicera, Neoascia unifasciata, Platycheirus sticticus, etc.

That the species named in the former paragraph are really rare is indisputable. But where to draw the line between "rare" and "uncommon" or "infrequent" ? A numerical definition may be useful, and, as we have now a fair idea of the distribution and frequency of our hoverfly species.

We have found such numerical circumsciption of rarity in J. LECLERCQ et al. (1980). After analysing the data in the first 1600 maps of the "Atlas Provisoire" J. LECLERCQ stated that species known to occur in fewer than 16 U.T.M.-squares (out of a total of 400) should be considered to be rare. If this criterion was accepted 910 of the 1600 species would have to be called rare, i.e. 56.88 %. The authors justify this by quoting a rule which says that "more than half the insect species that are not pests, have a rare occurrence". As we disposed of proportionately more (and more widely spread) records than had been available for these earlier maps we raised the limit from 4^2 to 5^2. The number of hoverfly species recorded from fewer than 25 squares is 167 (out of 314), i.e. 53.18 %.

6.2. THE RELATIVITY OF THE NUMERICAL DEFINITION OF RARITY :

Though we will go on using the numerical definition quoted in 6.1, namely rare = recorded in 1 - 24 U.T.M.-squares, it is only fair to point out that it is not an absolute criterion. It is neither fully objective nor definitive, but a rough-an-ready formula, a rule of thumb. It disregards the fact that our set of records is far from perfect. And it is obvious that as more data will become available it will have to be adapted accordingly. Moreover, it does not make a distinction between the present status of the species and the overall number of records. Species like Arctophila fulva or Xanthandrus comtus have been taken in more than 24 squares, but the scarcity of recent records suggests they have recently become much rarer.

There is an even more important element that should be taken into account, involving the 'nature' of the species itself. First of all, some species are more easily taken than others, especially when the traditional methods of sampling are used : species moving on the 'surface' of the vegetation are more liable to be taken than the ones that move among the vegetation. This disequilibrium has been compensated to some extent by the use of Malaise traps, but these are selective in another way.

Generally speaking the large 'typical'-looking and strikingly coloured Syrphidae, the ones that make coveted collector's pieces are over-represented, particularly in older collections. A much greater number of species are under-represented in collections. The reasons for this will presently be discussed in detail. Some may think in too much detail, but the non-specialist among the readers is often unaware of some of the ways in which many hoverflies escape attention. It will also help them to interpret distribution maps and phenology tables which need some relativation. Future collaborators will also know about which species additional information is especially needed in order to get a more objective picture of their faunistics.

The question therefore is to know which hoverflies are likely to be overlooked by the naturalist operating in the field.

a) Univoltine species, particularly those of early spring :

As will be shown in the section on phenology, a surprisingly high proportion of our hoverfly species are active only in spring. Some of them may already have disappeared by late April or even sooner, and because of the often unfavourable weather they may occur in low numbers. If collecting trips are made at this time of the year it will be in the immediate surroundings ; the distribution of these precocious species is therefore poorly known except near the dipterists' residences ; about remoter areas practically nothing is known. It seems improbable that species like the early Melangyna or Cheilosia are as scarce in the Ardennes as their distribution maps suggest.

b) Small, 'atypical' black hoverflies bearing only inconspicuous markings or none at all :

For the last 25 years many thousands of hoverflies have been collected by the inexperienced freshmen of the Faculté des Sciences Agronomiques at Gembloux ; among these Syrphidae specimens of genera like Neocnemodon, Neoascia (even the ubiquitous podagrica !), Pipizella, Heringia, Sphegina, Trichopsomyia, Triglyphus, Paragus, Orthonevra are extremely few in number. This counts, too, for all but the most abundant Cheilosia, Lejogaster and Chrysogaster. Even more knowledgeable entomologists may overlook some of these. Typical, for instance, is the underestimation of Neocnemodon : so few records are available that all species might be thought to be rare ; yet in about half the Malaise traps used so far specimens have turned up, proving that not only in woods but also in gardens and orchards Neocnemodon is normally about.

By the above remarks we do not mean to imply that all these species are frequent or widespread ; some are doubtlessly very rare or local.

c) Species which closely resemble related commoner hoverflies :

A typical example is Xylota tarda. It is so like X. segnis that it cannot effectively be distinguished from its eurytopic relative in the field. Both species are more variable than identification keys suggest. Now tarda has a more restricted range and it is also limited to woodland, probably deciduous forest only. It is widely believed to be rare, but it is not. If in appropriate places all segnis-like individuals are taken and examined it will often be found that there are one or two tarda among them ; occasionally tarda may be more numerous, e.g. inside a forest. In various sites tarda has also been taken in Malaise traps.

K. DECLEER also came to doubt the reliability of sampling by butterfly-net only, while investigating the Neoascia population of a wetland site. Even after many excursions only dispar had been netted, a species that occurred in myriads. Repeated sweeping the vegetation in the course of a day mid May revealed the presence of three more Neoascia species among the dominant dispar : 6 specimens of

podagrica, 10 aenea and 37 geniculata.

Other species which must often be overlooked because of their likeness with commoner and usually closely related hoverflies (the latter between brackets) :

- Metasyrphus latilunulatus, M. latifasciatus, M. lapponicus, M. nitens, M. nielseni, M. luniger (Metasyrphus corollae) ;
- Dasysyrphus friuliensis, D. nigricornis, D. lunulatus, D. hilaris (Dasysyrphus venustus);
- Platycheirus ambiguus, P. discimanus, P. sticticus (Platycheirus albimanus);
- Epistrophe melanostomoides, E. melanostoma, E. ochrostoma (Epistrophe nitidicollis) ;
- Epistrophe grossulariae, E. diaphana, Parasyrphus nigritarsis (Syrphus s.s.) ;
- Eumerus tuberculatus, E. sogdianus (Eumerus strigatus) ;
- Xylota xanthocnema (X. sylvarum) ;
- Xylota meigeniana, X. coeruleiventris (Xylota florum) ;
- Criorhina floccosa (Criorhina berberina var. oxyacanthae) ;
- Sphaerophoria div spp. (Sphaerophoria scripta) ;
- Eristalis abusivus (Eristalis arbustorum) ;
- Eristalis aeneus (female Eristalis sepulchralis) ; ...

d) Species with an atypical habitus :

The most striking example is no doubt Brachyopa, which may not be recognised as being a hoverfly until one has seen specimens in collections : an incentive for amateurs to visit museums ! It may also take some experience before hoverflies like Sphegina and Baccha are recognised, but the behaviour will betray their origin.

e) Near-perfect mimics of bees, wasps, bumblebees :

It is of course a well-known fact that there are plenty of accomplished mimics among our hoverflies ; it is one of the aspects that may first attract naturalists' attention to them. Nevertheless some of the unfamiliar hoverfly species must succeed in fooling dipterists and hymenopterists on occasion ! Excellent mimics are Criorhina asilica, C. pachymera and Mallota cimbiciformis (Apis mellifera) ; Ceriana conopsoides and Sphiximorpha subsessilis (not only the digger wasps of the genus Gorytes but also Conopid flies of the genus Physocephala); Mallota fuciformis and Pocota personata (bumblebees), Cheilosia chrysocoma (Osmia bees),... These are no doubt rare or uncommon species, but they may have been overlooked to some degree because of their mimetic powers. In any case Malaise trap experiments have shown that Temnostoma bombylans and T. vespiforme, which do not only look like wasps but have also succeeded in copying their model's behaviour, are more widespread than was generally assumed.

f) Many Syrphidae which lead a hidden existence :

A great many hoverflies normally remain invisible to the collector, particularly in warm and sunny weather because they then remain in the lower strata of the vegetation, where temperature and degree of humidity are more moderate. Sweeping may reveal their presence, but the more alert and fast flying species are not so often taken that way. It is here that Malaise traps have proved to be an excellent and indeed indispensable complementary tool for sampling. They have not only revealed the importance in terms of biomass of Melanostoma, Platycheirus and allied species ; they have also demonstrated that various other Syrphidae are less uncommon than is generally thought : Eumerus strigatus, Melangyna cincta, Lejogaster metallina, Xylota nemorum, Ferdinandea cuprea, Pyrophaena granditarsa, Pipiza bimaculata, Chrysotoxum arcuatum, C. bicinctum, Metasyrphus latilunulatus, Parasyrphus malinellus and many more,are more widespread than is normally appreciated. For a successful survey of the hoverfly population of a site various methods of collecting should be applied.

6.3. RARE SPECIES : THEIR DISTRIBUTION

In order to find out where the greatest concentrations of rare species have been found, as well as the location of sites or places with the richest hoverfly fauna, we have tried various approaches. The available information has been re-grouped and presented in the following forms :

- Table 2 : shows in which U.T.M.-squares the most varied Syrphid fauna has been recorded so far. There are 3 parameters : the total number of species, the number of rare species (recorded in fewer than 25 squares), the proportion of rarities in %.

- Maps C and D : show the geographical distribution of rare and uncommon species, respectively in figures and in symbols.

- Map E features the most explored areas. Ideally a survey of this kind should be systematical and the efforts should be spread equally over the territory. This map shows how great the gap is between ideal and reality. It also seeks to explain why some areas have been more thoroughly sampled than others, by locating favourite and reputed collecting areas, the residence of the chief Syrphidae collectors, the sites where the most successful Malaise traps and coloured dishes were used.
Maps 315 and 316 (sketching the proportion of woodland and the location of the principal nature reserves) are meant to supplement map E.
Maps A and B (total number of species recorded in each square) can of course be consulted in this context, too.

- Map F : shows where the very rarest species have been recorded, i.e. those that are known from 1 - 3 squares only.

6.3.1. WHERE HAS THE RICHEST HOVERFLY FAUNA BEEN RECORDED ?

J. LECLERCQ et al. (1980), who asked themselves the same question when analysing the first 1600 maps of the "Atlas Provisoire", found there were 24'rich' squares. By this they meant those squares in which 400 out of 1600 species (25 %) had been recorded. As we could dispose of the results of 7 more years of intensive field work it is not surprising that we found almost twice as many 'rich' squares : in 47 squares 25 % or more of the total hoverfly fauna have been recorded. Among these 47 there are 19 that also figure on LECLERCQ's list : this confirms the impression that Belgian entomologists tend to flock to the same sites, or ... that these sites contain the richest insect fauna. Indeed, places like Han-sur-Lesse, Spa/Francorchamps, Virton/Ethe, Torgny, Chiny/Herbeumont, the Montagne St. Pierre, ... are rich in natural or semi-natural habitats that harbour a particularly rich or exceptional entomofauna.

However - and again J. LECLERCQ's findings are confirmed - several urban and suburban sites are no less rich than those reputed natural sites. In part this can be explained in terms of accessibility : the immediate surroundings of one's residence are best explored : the entomologist knows the best places and he can reach them at any time. Yet, accessibility is not the only factor at play. There are some sites in urban and suburban districts that offer a wealth of variety in biotopes. J. OWEN (1981) gives an example of the richness of the hoverfly fauna in a large and varied suburban garden. But this is not only found in gardens or parks.

Those twilight zones between town and country, though for the greater part desert-like and utterly uninteresting, may nevertheless contain relicts of landscapes that have long been irreversibly destroyed in the so-called countryside. If some agricultural activities still subsist in suburban zones they are often marginal. Nothing here of the ruthless application of modern technology that has laid waste most rural regions. Neglected country-house parks that have escaped from the developers are surprisingly rich. Most promising of all are tracts of former agricultural or market-gardening plots that have been 'set aside' for future development, and where human activities have been negligible for many years.

There is nothing surprising therefore in the fact that among the 10 richest squares in table 2 there are no fewer than 6 that are mainly urban or suburban in character.

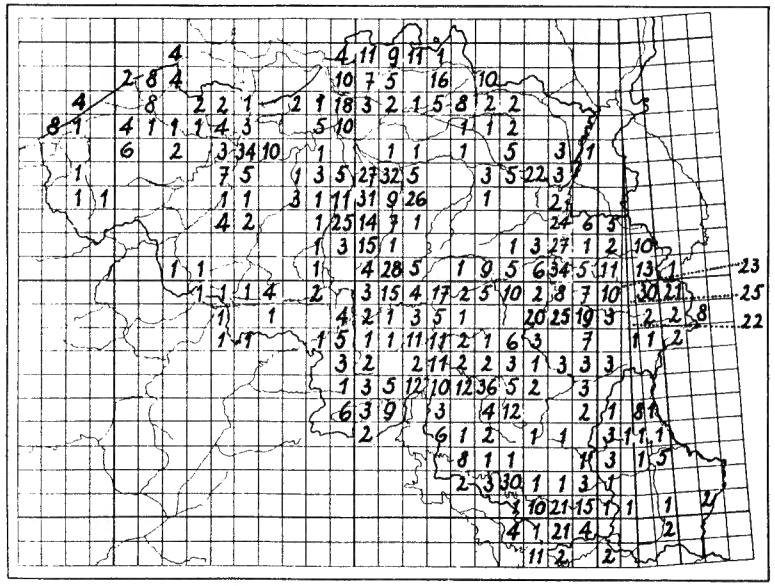
Intensity of sampling, especially if it has gone on for a long time, remains an important factor, of course. This is demonstrated most clearly by the example of FS.10 (Gembloux). It is difficult to imagine a less promising area for collecting Syrphidae : it is a bleak agricultural area where only a limited number of more natural features can be found, and these are as a rule quite small, too : abandoned orchards, tiny copses, remnants of parkland ; there are almost no wetland sites of any kind. Yet 135 hoverfly species have been caught ; among these there were a good deal of rarities that were taken repeatedly, not just once. How to explain such diversity ? The chief reason is that (resident) students have been collecting there for 25 years and that mechanical traps have been used frequently. Also it lies in a phytogeographical district with a rich overall entomofauna, so that recolonisation is easy.

Table 2

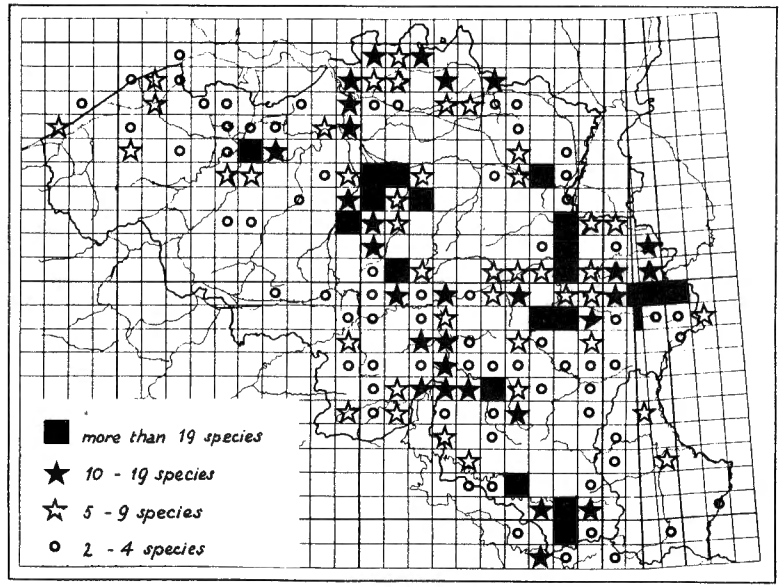
Legend: ENVIRONMENT
U = urban s = suburban r = rural

METHOD
M : sampled methodically all seasons
T : by means of (Malaise) traps

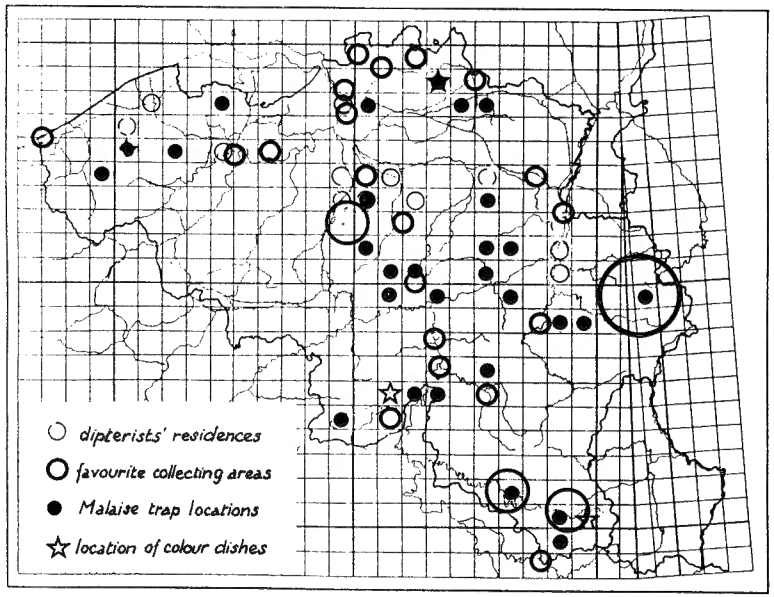
GRID REFERENCE	LOCALITIES WHERE MOST OF THE SAMPLING WAS DONE	ENVIRONMENT	total number of species	order of importance	number of rare sp.	order of importance	proportion of rare sp. in %	order of importance	METHOD
FS.03	Tervuren, Kortenberg, Oudergem	s	152	1	31	5	20,4	15	M
FS.80	Embourg, Tilff	s	148	2	36	1	24,3	4	M
FR.61	Les Epioux, Chiny, Herbeumont	r	147	3	31	5	20,5	12	T
FR.55	Rochefort, Han-sur-Lesse, Belvaux	r	143	4	36	1	25,2	2	
ES.92	Ukkel, Bosvoorde, Zoniënwoud	s/r	142	5	25	12	17,6	21	
FS.14	Veltem-Beisem, Winksele	s/r	142	5	32	4	22,5	6	M
KA.99	Mont Rigi, Sourbrodt	r	142	5	29	7	20,4	14	T
FQ.89	Virton, Ethe, Ruette, Grandcourt	r	135	8	21	18	15,5	26	
FS.10	Gembloux	u/r	135	8	27	8	20,0	16	M/T
ES.55	Gent, Melle, Heusden	u/s	133	10	34	3	25,5	1	M
KA.89	Bévercé, Malmédy	r	129	11	25	12	19,3	19	-
FS.04	Kampenhout-Berg, Erps-Kwerps	r	128	12	27	8	21,0	9	M
FS.23	Leuven, Egenhoven, Heverlee	s	124	13	26	11	20,9	10	M
FR.88	Ferrières	r	124	13	25	12	20,8	11	T
FR.80	Buzenol	r	120	15	21	18	17,5	22	
FS.81	Liège, Angleur, Jupille	u	119	16	27	8	22,8	5	M
FR.39	Namur, Erpent, Marche-les-Dames	u/s	118	17	17	25	14,4	31	M/T
FS.82	Visé, Montagne St. Pierre	r	117	18	24	15	20,5	12	
GR.19	Hockai	r	116	19	23	16	19,9	18	
FR.64	Mirwart, St. Hubert	r	110	20	13	31	11,0	51	
LA.09	Elsenborn, Rocherath, Krinkelt	r	110	20	21	18	19,2	20	M
FR.35	Beauraing, Winenne	r	109	22	10	41	9,1	-	T
FS.01	Ottignies, Genval, Rixensart	s	107	23	15	27	14,0	33	T
ES.97	Antwerpen, Hoboken	u	105	24	18	24	17,1	23	M
FR.90	Vance	r	105	24	15	27	13,3	36	
FS.13	Bertem, St. Joris Weert	s/r	104	26	9	48	8,6	-	M
FQ.89	Torgny, Lamorteau	r	104	26	11	35	10,5	54	
FS.02	Hoeilaart, Overijse, Groenendaal	s/r	103	28	14	30	13,6	35	
FS.38	Turnhout	r	101	29	16	26	15,8	25	T
FR.78	Durbuy, Bomal, Hamoir	r	100	30	20	21	20,0	16	
FR.19	Mazy, Bossière, Onoz-Spy	r	99	31	15	27	15,1	28	M/T
FS.74	Genk, Munsterbilzen, Zutendaal	r	96	32	20	21	21,1	8	
FR.25	Treignes	r	95	33	12	33	12,6	39	T
GS.00	Jalhay, La Gileppe	r	91	34	11	35	12,0	45	
FR.27	Falaën, Montaigle	r	91	34	11	35	12,0	45	
FR.69	Modave, Terwagne	r	90	36	10	41	11,1	49	M/T
GR.09	Spa	r	90	36	10	41	11,1	49	
KA.88	Recht	r	90	36	22	17	24,4	3	
FR.65	Bure, Forrières	r	87	39	5	62	5,7	-	
ES.93	Brussel, Ixelles, Jette, Schaarbeek	u	87	39	11	35	12,7	38	
FR.98	Lorcé, Targnon	r	83	41	19	23	21,5	7	T
FR.36	Dinant, Anseremme, Bouvignes	r	83	41	11	35	13,2	37	
FR.45	Wellin, Ave et Auffe, Villers-sur-Lesse	r	83	41	12	33	14,4	30	
ES.17	Brugge	u/s	80	44	8	51	10.0	55	M
ES.96	Wilrijk, Kruibeke, Bazel, Niel, Schelle	s/r	80	44	10	41	12,5	40	
FR.99	La Reid	r	79	46	7	57	8,7	-	
FS.20	Sauvenière, Liernu, Perwez, Grand Leez	r	79	46	5	62	6,3	-	T
... A FURTHER SELECTION :									
ES.16	Oostkamp, Tillegem	s/r	78	48	1	-	1,2	-	M
FR.14	Nismes, Dourbes, Pétigny	r	78	48	9	49	11,5	48	
ES.98	Ekeren, Kapellen, Stabroek	u/s	78	48	10	41	12,8	38	M
FS.08	Brasschaat	s/r	77	52	7	57	9,0	-	M
FR.37	Yvoir, Godinne	s/r	77	52	11	35	14,2	32	
KB.90	Baraque Michel, Hautes Fagnes	r	74	54	13	31	16,2	24	
ES.28	Knokke	r/s	74	54	4	-	5,4	-	M
FS.09	Kalmthout	r	73	56	11	35	15,0	29	M
FR.70	Izel, Jamoigne	r	73	56	10	41	13,7	34	
ES.18	Zeebrugge, Lissewege	r/s	72	59	8	51	11,1	49	M
FS.58	Postel	r	71	60	9	49	12,6	39	M
FS.50	Wanze, Huy, Antheit	r/s	71	60	9	49	12.6	39	T
ES.65	Overmere	r	69	64	10	41	14,4	30	M
ER.94	Virelles	r	69	64	8	51	11,7	47	T
ES.05	Wijnendale Forest	r	68	66	5	62	7,3	-	M/T
FS.47	Mol	r	66	70	8	51	12,1	43	T
DS.76	De Panne, Koksijde, Oostduinkerke	r/s	66	70	8	51	12,1	43	T
KA.84	Clervaux	r	65	72	8	51	12,3	42	
KB.91	Hertogenwald, Eupen	r	65	72	10	41	15,3	27	
FS.29	Hoogstraten	r	61	81	11	35	18,0	20	M



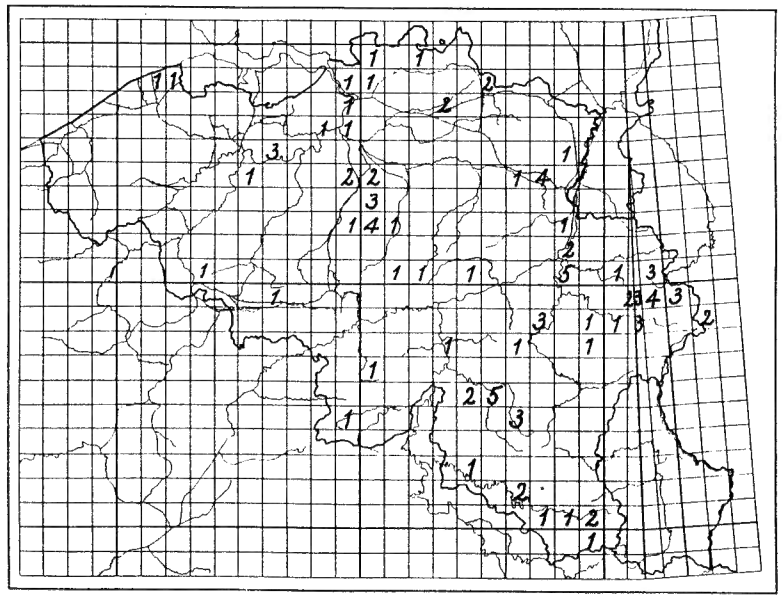
MAP C: Distribution of rare and uncommon species (i.e. recorded in 1 - 24 U.T.M. - squares): in figures



Map D: Distribution of rare and uncommon species : schematised



Map E: Location of the most thoroughly explored areas



Map F: Distribution of the very rarest species (i.e. recorded in 1-3 squares)

This last point is important, of course. In a phytogeographical district where the overall number of hoverfly species is low, as in the Maritime and the Flemish Districts, there can hardly be any'rich'squares. In the western half of the country there is only one square where over 80 species have been counted : ES.55. This is a very 'rich' square, indeed ! But those 133 species were collected over 40 years and by the most eminent dipterists of their time. There may even have been some strays among them : nowhere has a higher proportion of rarities been recorded. ES.55 lies in the contact zone between the Flemish and Brabant Districts, and such zones can be very rich in species. Unfortunately most of the sites where this fruitful collecting was done 1910 - 1950 have now been destroyed. In other parts of Flanders, however, these riches have never been equalled, though in the neighbourhood of Brugge collecting has been intensive and expert, including the use of traps.

6.3.2. THE CORRELATION BETWEEN A 'RICH' FAUNA AND THE NUMBER OF RARE SPECIES :

To formulate the problem differently : how much correlation can be seen between the darkest squares and areas in map B and map D ? Generally speaking the areas of concentration are found in the same regions. It might even seem superfluous to ask the question at all : surely when a large number of species have been recorded (because collecting was done expertly or over a long period) there will be a good deal of rarities among them ?

The answer is yes, up to a point. Among the 12 squares that scored highest in the total number of species, all but one also belong to the top dozen where most rare species were recorded. Lower down the list the correlation is much smaller. This can be best appreciated when the second figure in each column is taken into account. An extreme example is KA.88 (Recht, Wolfsbusch) : though "only" 90 species are known from this square (N° 36 in rank) there were 22 rarities among these (N°17) ; this is however 24.4 % of the total (N° 3 !) In this instance there is an explanation. Most sampling was done here by a hoverfly expert, J.A.W. LUCAS, in about half a dozen excursions all in spring. As a very experienced collector he took many rare species, among which the only known Belgian specimens of Dasysyrphus nigricornis. As there has been virtually no sampling in other seasons the overall number of species is not too high ; LUCAS may also have disregarded more trivial hoverflies he did not need for his collection. Other squares with a relatively high proportion of rare species are KB.90 (the large bogs around the Baraque Michel), FS.29 (Hoogstraten, at the time when it was explored entomologically, rich in humid heaths and Sphagnum bogs) : both contain exceptional habitats , which harbour many rarities, but not necessarily a large and varied hoverfly fauna. The case of FR.98 (Lorcé) is different : here the high proportion of rare species was taken mainly in a well-sited Malaise trap.

At the other end of the scale is the example of ES.16. This area south of Brugge is mainly rural : varied countryside with a more than average proportion of woodland in this thinly wooded region, as well as a fair share of wetlands. It has been well explored, too, and in at least one site, the sampling was methodical. Yet among the total of 78 species, the second highest in the province, there was only one rare hoverfly, a proportion of just over 1 %. In adjacent ES.17 there were 10 % of rarities out of a comparable total of 80. These rare species were taken in man-made environment, industrialised at that ! The examples of ES.97 and ES.98, both in the twilight zone of Antwerpen, where an even higher proportion of rarities was recorded, show that this is nothing unusual and that naturalists do well in visiting such areas.

The final column of Table 2 shows how successful an instrument Malaise traps are when it comes to the recording of rare species. Yet these traps have not been systematically placed in areas reputed for their entomofauna, as one might well think. In practice they have been placed wherever an undisturbed site was available for the experiment and a volunteer to change the alcohol container and collect the material.

Map F, finally, which shows the number of extremely rare species recorded in each square : there is a positive correlation between the areas of concentration here and in maps B and D ; one would hardly have expected anything else. Yet there are surprises. Gent (ES.55), the square with the highest proportion of rare species (see above) and some others that score high on this point (FR.88, FQ89, FS.23, FS.14) are blank on map F. The capture of such very rare species, which may be strays or very elusive insects, is sometimes a matter of pure luck. Thus there was a specimen of Callicera bertolonii among the otherwise unremarkable catch of a Malaise trap placed in an orchard at Liernu (FS.20), in a well-explored but rather dull agricultural district. J. LECLERCQ et al. (1980) also found that records of the rarest species were scattered all over the country, though of course the richest and best explored areas show the greatest concentrations, in our case FR.55, FS. 80, FS.74, KA.99, FS.02.

7. PHENOLOGY

7.1. TABLE 3 : DISCUSSION AND COMMENTS :

Table 3 summarises all available data about our hoverfly species, arranged in decades of 10 days. It is meant to give a clear picture of the phenology of each species : the length of the flight period (the exact extreme dates of capture are found in Table 1), the evolution of numbers throughout the season, the period(s) of peak activity, in many cases the number of generations, all this can be seen at a glance.

It is evident that these figures have only a relative value and should be carefully interpreted. The following points ought to be considered :

- The number of records differs widely from species to species ; it ranges from 1 to 4407 ! In a few cases no figures are entered : the few available records were not or only incompletely dated.
Yet the disparity in number between the commonest and the rarest species may be much greater than is suggested by these figures. Species like Eristalis pertinax, Episyrphus balteatus or Melanostoma mellinum may occur in such numbers that estimates are ruled out. On the other hand one may spend half a lifetime collecting hoverflies without ever setting eyes on a single Callicera, Myolepta or Pocota.

- Within the same species the disparity in numbers between peak periods and and periods of low activity may also be distorted. An experienced collector, for instance, will not fail to record the specimens of Episyrphus balteatus seen in March or April, but may completely ignore the myriads that are about in August.

- Another distorting factor is the definite bias among collectors towards field work in spring and to a somewhat lesser degree in early summer. This of course to the detriment of autumn, when there are often more individuals about than in spring. There is a good reason for this neglect : there are few interesting species about. This may not be a very important factor, but nevertheless the drop in numbers in the course of September may be less sheer than the figures in Table 3 suggest. The bias towards spring collecting is quite pronounced among the Gembloux students who have supplied such an impressive number of records about the commoner species. The prescribed number of insects must be pinned and identified before the exam period starts.

- Our data are far more unevenly spread in space than the distribution maps suggest. There are only a very limited number of records from several areas like Limburg and the greater part of the Ardennes. On the other hand there are areas where observations were made throughout the year : the surroundings of Brugge, Gent, Antwerpen, Brussel, Leuven, Genk, Gembloux, Namur, Liège, as well as the agricultural parts of Hainaut and Brabant, to a lesser degree also the traditional collecting sites mentioned before, particularly the Hautes Fagnes. Fortunately each climatic region is well-represented so that eventual differences may have ruled each other out in the end. Moreover the greatest concentration of records has been in the centre of the country, which is considered to be representative of the territory as a whole.

- Though much of the information that has been used here was obtained these last years, particularly about the commoner species, the records assembled in Table 3 have been gathered over more than a century and in various parts of a territory, which is far from homogeneous. General climatic changes are known to have taken place in the last 110 years, and anyway weather circumstances differ sharply from year to year. Further the considerable climatic differences within the country must have an effect on the phenology of hoverflies in the different regions.
Adding all these data gathered over such long period and in a variety of places where regional differences are important must have a blurring effect, less so than in large countries with even greater regional disparities like F, GB or D, but surely more so than in NL, where conditions are more homogeneous. Unfavourable weather may put off the eclosure of some species for two or more weeks ; exceptionally clement weather may cause abnormally early eclosures and in autumn possibly the development of an extra generation. Location is an important factor, too : on the cold, bleak high plateaux of the Hautes Fagnes spring may arrive up to three weeks later, so the eclosure of spring species is delayed considerably. Our records even suggest that in the southern part of the country a number of species develop an additional generation (Cheilosia variabilis, Neoascia aenea, ...)
It is clear that the assembling of such widely disparate data in one single table has a deforming effect: the flight period of some univoltine species appears to be impossibly long for such relatively short-lived species as hoverflies are thought to be; species known two produce two clearly separate broods now appear to have an uninterrupted flight period. Prolonged local observations and also the use of Malaise traps may correct this picture.

Yet this blurring of the phenological statistics due to the climatic differences in time and space is not apparent in all the species. The histograms on the following pages show quite a normal pattern. It seems therefore possible that it is in only some of the species that unusual weather circumstances advance or retard the eclosure of the imagines ; other species may not possess this adaptibility. As a consequence of this rigid programming a generation may be seriously affected : decimation or even virtual annihilation of one or more broods may explain why some species appear in such wildly fluctuating numbers in consecutive years. Yet these fluctuations do not necessarily appear in the statistics when records over a great number of years are assembled.

- Summing up, just how reliable are the phenology data in Table 3 ?

a) Much depends, obviously, on the number of records that were available. For a species with a short flight period a total of 50 records, sometimes even less, may be sufficient ; for bivoltine species probably 100 records may be needed and polyvoltine species with a very long flight period should be even better documented : 150 - 200 would seem enough.
The rarer species, particularly those with a long flight period, are for the moment imperfectly known : there are gaps, the evolution in numbers seems haphazard. We hope readers will help us in filling these gaps by communicating their data.

b) When the figures in Table 3 are interpreted it may be necessary to take at least some of the reservations into account that were formulated in the preceding paragraphs. It must not be forgotten that the figures are the result of compiling data that were collected over a very long time and in widely different places that possibly have too little in common to be assembled without any reservations.

7.2. THE VARIOUS STRATEGIES IN COMPLETING THE LIFE CYCLE :

The different patterns in the phenology table are conditioned by the different patterns in the life cycles of the various hoverfly species. Like all Diptera hoverflies have a complete life cycle with the stages egg - larva - pupa - adult. Especially in the larval stages species adopt distinct strategies. The following classification is borrowed from GOELDLIN's important paper on carnivorous Syrphid larvae (1974). The different strategies were observed in the course of laboratory experiments using local (i.e. Swiss) material. This reservation is expressly stated because comparison between the phenological data of the same species in different countries show that many species adapt these strategies to the local physiological circumstances :

a) univoltine species : i.e. those that develop only one brood per year. The larvæ undergo a long, obligate diapause which lasts just under one year. They then pupate and after a short time (circa 2 weeks) the adults appear : most eclose in spring, some species do so in summer.
Examples are plentiful. They can easily be recognised in Table 3. The phenology of the adult stage is shown in the series of histograms following this section : Cheilosia grossa, C. albipila, C. lenis, C. fraterna, Orthonevra brevicornis, Neocnemodon pubescens, Brachyopa pilosa, Platycheirus ovalis, Temnostoma bombylans, Ischyrosyrphus laternarius and Microdon eggeri.

b) facultative univoltine species with an obligate larval diapause :the adults are active essentially in spring, but they may develop a second, usually much smaller brood in summer ; perhaps this occurs only in some years or only in those regions where circumstances are favourable. Examples in our fauna are : Leucozona lucorum, Pipiza festiva, Heringia heringi, probably also Criorhina berberina and Xanthogramma citrofasciatum. Tropidia scita appears to have two small additional broods.
Some very late captures of e.g. Cheilosia albipila, Epistrophe eligans, E. nitidicollis and Platycheirus ovalis, all known as essentially univoltine species, suggest that these may produce a very small second generation in exceptionally favourable circumstances.

c) oligovoltine species (i.e. producing a few generations) with an obligate diapause lasting several months : in our region they are bivoltine producing a separate spring genration and a summer or autumn brood.
Examples : Cheilosia proxima, C. canicularis, C. carbonaria, Orthonevra splendens, Dasysyrphus albostriatus, D. tricinctus, Pipiza noctiluca, P. austriaca, Rhingia campestris. In the histograms the long diapause does not at all appear. This is because the records were blurred through compiling them over many years (7.1). Moreover Malaise traps have shown that the species do not altogether disappear during that period ; in 1986, e.g. female Rhingia campestris, exceptionally numerous that year, continued to get trapped throughout the period they remain normally unseen : late June and July. Probably some adults live much longer than the one to two weeks which is thought to be the normal lifespan of an adult hoverfly. The histogram of Platycheirus peltatus shows a similar pattern, though it is not considered a bivoltine species.

d) oligovoltine species with a facultative larval diapause : These generally produce several generations, but part of the individuals may undergo a larval diapause of varying length.

The latter feature may be a strategy that allows the species to adapt to particular circumstances ; during a spell of unfavourable weather unsuitable for the adult eclosure may thus be deferred. The effect of this strategy may sometimes be observed in the field. Thus Metasyrphus corollae and M. latifasciatus in the hot and dry summer of 1983. Normally these two species reach their summer peak of activity in August. In 1983 they were virtually absent from the scene in August, but made a mass appearance in September, continuing to be frequent well into October.

Other examples : Syrphus ribesii, S. torvus.

e) polyvoltine species (i.e. producing many broods) without larval diapause, except for the last brood, which hibernates in larval form. These normally produce a number of generations that succeed one another without a noticeable break.

Examples : Neoascia podagrica, Platycheirus albimanus, Eristalis pertinax, Eristalis arbustorum, Syritta pipiens, Xylota segnis, Cheilosia pagana, ...

f) polyvoltine species without larval diapause and with at least some of the females hibernating as adults. Their larvae pupate without a preliminary diapause, except maybe the winter generation. The various broods succeed each other without apparent breaks.

Examples : Eristalis aeneus, E. tenax, probably Episyrphus balteatus. It should be added that so far no hard evidence has been discovered in this country, i.e. no overwintering females have been found. In NL and GB the two Eristalis species have on several occasions been discovered in their hiding places (COE 1953, VdG81).

7.3. EXTERNAL FACTORS INFLUENCING THE PHENOLOGY OF THE SPECIES :

a) THE PHENOLOGY OF PLANTS :

As the pollen and nectar produced by flowering plants is the main food sou of most hoverflies, their appearance is inevitably geared to the phenology of flowering plants. There are, however, very few hoverflies that rely on one particular plant species for food, though of course some genera depend on particular plants in their larval stage (Cheilosia, whose larvae feed on stems and roots ; Neoascia, whose larvae derive their oxygen from water plants).

Many Syrphidae obviously prefer umbel flowers (Apiaceae), flower heads of Asteraceae and Dipsaceae, but this is a matter of accessibility. Dependence on one particular plant species for food, however, is exceptional. Cheilosia velutina is such special case : it is always seen on Daucus carota ; this may be a means of avoiding competition : Daucus is not a very rich food source and does not attract many other hoverflies. Anyway the flight period of Cheilosia velutina corresponds with the flowering of Daucus.

It is difficult to think of similar close links. Cheilosia albitarsis is nearly always seen on Ranunculus, especially R. repens, but when it happens (as in the spring of 1986) that some albitarsis are already on the wing before the Ranunculus flowers are open, the flies seem to have no difficulty in switching to other food plants like Cardamine pratensis. Normally the close links between hoverflies and plants seems to concern flower types rather than species. Thus Cheilosia impressa nearly always forages on umbels, but they seem equally content with Pastinaca sativa as with Heracleum spondylium. Cheilosia canicularis on the other hand will ignore the most abundant supply of umbels and forages on yellow Asteraceae ; it does not seem to matter which species it is, but there is a pronounced preference for the type of composites with ray flowers only (Hieracium sp., Taraxacum sp.)

These, however, are rare exceptions ; the flight period of hoverflies seems geared to periods of mass flowering rather than to the phenology of particular plant species. As will be seen further on (7.5), hoverfly activity is maximal when food supplies are most abundant, i.e. in late spring and again mid and late summer.

b) The phenology of some hoverfly genera may be geared to other external factors. Thus the species which feed on sap flows and whose larvae depend on the same food sources (Brachyopa, Ferdinandea) are either exclusively or mainly active in spring when sap flows are most abundant. And the Syrphini, Bacchini and Pipizini, whose larvae are carnivorous, depend for their procreation on the presence of aphids and other prey insects. Little is known about prey-specificity, however, and one can only suppose there may be links between the flight period of certain hoverflies and the phenology of their prey species.

Table 3 (1)

	I	II	III			IV			V			VI			VII			VIII			IX			X		XI	XII
Anasimyia contracta													1					1	1	1	1						
A. interpuncta							1	1	7	15	13	10	5		2	5	4	2	2	1							
A. lineata							1	3	4	9	15	16	25	23	3	10	6	10	5	11	2	3					
A. lunulata							1					1					1	1									
A. transfuga									2	9	7	1	6	2	5	3	1	6	7	10	2		2				
Arctophila bombiformis												2	6	5	5	4	10	12	15	15	7	8	4	2			
A. fulva								1			2		2	1		1		4	11	10	11	12	5	2	1	1	1
Baccha elongata + B. "obscuripennis"					1	2	1	14	27	37	21	19	10	8	19	23	28	20	24	16	6	3	1	1	1		
Blera fallax									1	1	1	2	4	2				1									
Brachyopa bicolor							1	6	4	7																	
B. insensilis							1	1		1	1																
B. panzeri								2	14	17	3	9	2														
B. pilosa						3	4	7	16	17	2	2	4														
B. scutellaris						1	3	5	16	8	2	5	1														
B. testacea								3	2	7	8	2	1	6		1											
B. vittata													1	3	1												
Brachypalpus eunotus								1	1																		
B. laphriformis							1	1	2	4	2	3															
B. meigeni									1																		
B. valgus				1			2	1		2																	
Caliprobola speciosa								1	1	11	8	12	4	2			2										
Callicera aenea											1																
C. bertolonii													1						1								
C. rufa													1														
Cariana conopsoides								3	2	1	1	6	2	2	1	1	2										
Chamaesyrphus lusitanicus									1		2	2	1														
C. scaevoides																											
Cheilosia acutilabris														1			1										
C. albipila			2	5	15	31	17	24	1	5	1			1								1			1		
C. albitarsis			2	1	1	4	6	12	76	202	316	222	225	105	42	13	5	1	3	3		1					
C. antiqua							1		5	10	3	3															
C. argentifrons									3	1	3																
C. barbata									2	1	6	6	4	8	13	26	21	11	6	13							
C. bergenstammi							4	4	3	9	2	2	1				1	3	6	4	1	3					
C. caerulescens										1	1	1										1					
C. canicularis							3	6	5	9	6	8	5		4	1	4	6	22	16	12	11	5	2	1		
C. carbonaria								2	8	6	11	15	2	5	11	2	4	24	4	7	1						
C. chlorus				1		2	14	24	18	15	10	19	7														
C. chrysocoma						4	10	7	11	3			2	1													
C. cynocephala										3	4	3		1	3	2	1	1	2	4	1						
C. fasciata				1		2	1	2	12	2																	
C. flavipes								2	7	13	7	3															
C. fraterna							3	5	16	23	19	12	9														
C. frontalis									1	1											1						
C. grossa			1	5	10	8	10	3																			
C. honesta								2	2	4	11	2	5	1													
C. illustrata										6	17	21	25	27	34	54	53	42	66	32	9	2					
C. impressa										1	7	7	2	4	3	4	17	25	42	52	15	5	6	1	1		
C. intonsa									6	3	2	3	1	2	2	1	5	1	2	2	2	1					
C. langhofferi											1		1														
C. lenis						3	8	6	24	22	19	7															
C. longula															1	1	2		4	7	4	3	4				
C. maculata									4	6	15	76	54	2		1											
C. mutabilis											2	3	6	10	13	16	10	5	2	5	1						
C. nasutula							1	1	5	12	8	9	5	3	2			1									
C. nigripes								1	6	9	3	1															
C. omissa								1			1																
C. pagana				1		11	23	35	58	49	61	35	38	29	37	47	58	101	155	116	23	8	3	1			
C. praecox							1	8	11	7	5	1															
C. proxima								1	3	11	9	4	5	2	1	7	12	11	14	7							
C. pubera									1		2	2					1										
C. rotundiventris							1	3	6	1	2	1						2									
C. ruficollis									1	1		1				1				1							
C. rufimana								3	8	5	2	1			1												
C. scutellata									1	2	4	1	4	7	10	7	21	15	15	20	6	5					
C. semifasciata									3	3	4		1														
C. soror												1					1	1	1	2	1	1					
C. trisulcata							1		1		2																
C. variabilis						3	2	2	18	43	70	37	41	45	30	25	17	12	3	4	1						
C. velutina									1			3			1	2	4	2	11	11	6	1					
C. vernalis						2	5	10	20	20	22	11	6	2	5	10	13	10	23	21	12	6	7	2	2		
C. vulpina								1		3	1	1	1			4	3		2	1							
Chrysogaster chalybeata							1			3		2	6	2	2	9	4	5	11	16	2						
C. hirtella							1	1	17	36	69	44	57	40	4	4	2	1	1		1	1					
C. macquarti																			1								
C. solstitialis				1	1				5	9	18	19	20	17	20	21	31	22	32	22	9	4	5				
C. viduata									6	16	45	44	23	17	6	2	2		1	1				1			
C. virescens								1		1		5	5	3	1							1					
Chrysotoxum arcuatum										4	12	17	16	6	2	10	5	9	19	9	2	3	1				
C. bicinctum											1	6	12	32	55	42	55	39	46	29	4		1	1			
	JAN.	FEB.	MARCH			APRIL			MAY			JUNE			JULY			AUGUST			SEPT.			OCT.		NOV.	D.

Table 3 (2)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Chrysotoxum cautum				1 3 3	25 76 165	160 103 49	25 11 3	11 4 2	1			
C. elegans					1 3	1 1	1	1 2 1	1 1			
C. festivum					3 1 5	6 10 6	12 6 9	14 5 11	3			
C. intermedium					1		1 3					
C. latilimbatum												
C. octomaculatum					1		1	2 3 2	1			
C. vernale					3 5 7	3 7 5	5 1					
C. verralli							1 2	2 2				
Criorhina asilica				2 9 11	12 7 1	1						
C. berberina				1 1 4	13 34 48	30 50 30	6 15 8	1 4 3				
C. floccosa				1 2	1 8 5	1 1 1	1					
C. pachymera				1	1 3							
C. ranunculi			2 1	1 3 3	4	2						
Dasysyrphus albostriatus			1	1 6	12 25 36	23 10 7	8 8 8	10 29 30	18 4			
D. friuliensis					2 2 8	10 2 3	3 2 1					
D. hilaris				2	6 14 22	22 15 13	6 4 1					
D. lunulatus				1 1	5 6 21	23 19 13	5 2 2	4				
D. nigricornis					1							
D. tricinctus				7	14 22 10	4 6 1	3 9 5	12 33 27	14 7 5	1		
D. venustus				1 1 9	36 82 93	69 61 43	12 2 5	1				
Didea alneti					2 2	1 3 2	4 1	3 3 2	2 2 1	1		
D. fasciata					2 2 3	2 2 4	3 4 8	7 9 14	2 3 1	2 3		
D. intermedia					2 1	2 1 3	4	3 9				
Doros conopseus					1	5 2 4		1				
Epistrophe diaphana						1 3	4 2	1 1				
E. eligans				3 8	59 113 81	48 22 5	2 3	1 1	1 1			
E. euchroma				4 3	4 6 2	5						
E. grossulariae					1 1 1	2 5 9	6 16 18	10 17 10	3 1 1			
E. melanostoma					1 3 3	2 2	1					
E. melanostomoides					1 2 5	7 3 2	10 1					
E. nitidicollis				2 3	9 29 31	23 27 13	4 5 3	1				
E. ochrostoma					3 7	1						
Episyrphus auricollis			1	3 3 2	5 2 7	17 14 22	28 20 26	36 18 21	6 3	1 1	1	
E. balteatus		1 2	4 7 6	16 14 7	19 35 59	86 123 152	220 317 422	559 854 983	384 172 46	13 16 11	9 3 1	
E. cinctellus				1 3	13 9 15	12 14 7	22 19 28	44 51 47	34 9 3	1		
Eriozona syrphoides					2	1 3	2 4 1	6 8 2	4			
Eristalis abusivus				1 1 1	10 21 14	8 15 13	7 11 22	27 29 21	12 4 1			
E. aeneus			2 1	5 5 4	7 3 1	5 2	3 1 4	7 11 15	5 5 1			
E. alpinus						1 1 1	1	2 1	1			
E. arbustorum			2 4	18 34 53	94 151 145	94 134 98	120 124 132	161 206 232	128 62 41	12 16 7		
E. cryptarum					1 1	1 1						
E. horticola				2 2	10 15 17	30 44 16	27 38 24	34 46 26	16 8 1			
E. intricarius			1 1	7 23 22	15 25 10	13 31 43	41 40 35	26 29 27	7 1 1	1		
E. jugorum					1	2 1 6	8 6 6	3 1 6	4 3 1	1		
E. nemorum				8 4	29 34 37	37 88 102	113 105 64	51 91 76	38 20 7	2		
E. pertinax	1	1	3 5	27 82 117	215 258 192	135 136 87	74 98 112	178 184 153	79 56 29	10 6 13		
E. ? piceus				8	1 2 10	2 44 14	5 12 1	1 1				
E. pratorum			1	2 4 4	3 6 4	10 19 25	11 6 10	2 4 4		1		
E. rupium				1	4 6 6	10 15 10	10 7 15	7 9 6	2 2			
E. sepulcralis				3	13 24 29	35 41 26	36 58 71	51 70 68	22 5 6	1		
E. tenax	1	1 1	4 3 8	16 18 15	42 67 90	111 145 79	101 143 179	201 270 268	187 114 71	47 52 57	33 16 3	1 3
Eumerus flavitarsis						1 1	1 2 2					
E. ornatus					1	2 1	1 1 1		1			
E. sabulonum						1	1 1	1 1				
E. sogdianus ♂♂					1 1	1 1	2	5				
E. strigatus					1 1 10	17 50 38	14 21 38	54 83 58	34 4 2			
E. tarsalis						1	1					
E. tricolor					1 1	2 3 6	2					
E. tuberculatus					1 2	2 6 2	2 3 1	8 9 8	4			
Ferdinandea cuprea				2	7 10 26	18 36 24	12 6 7	7 9 9	4 2	1		
F. ruficornis					2		1 1					
Helophilus hybridus					1 4 4	6 5 1	3 5 1	2 17 8	6 1			
H. pendulus			1	2 8 74	117 139 173	142 234 159	97 77 146	113 281 206	181 172 117	18 10 22	2	1
H. trivittatus				3	4 29 24	33 27 19	9 26 47	53 92 75	61 18 7	3		
Heringia heringi					2 10 3	3 2 2	1	1 1				
Ischyrosyrphus glaucius				1	3 1	1 1 3	15 18 34	39 34 24	17 3			
I. laternarius						3 13	17 20 19	8 5 5	1			
Lejogaster metallina				1	7 13 34	19 19 10	4 10 23	16 17 10	1 1			
L. splendida					2 4	4 1	2	3 2 1				
Lejops vittata					1	2		1				
Leucozona lucorum				1	27 62 64	43 28 14	14 4 1	1 4 2				
Mallota cimbiciformis												
M. fuciformis				2 2	1							
Megasyrphus annulipes				1	1 4 7	10 7 5	18 2 2	5 7 4	1			
Melangyna barbifrons				1 1	1							
M. cincta				1 3	13 16 10	9 8 3	7 9 6	5 4 3	1 2			
M. compositarum						1	1 1	1				
M. guttata					1	2 2 1	1 1 2	2 4 3	1 1			
Heringia senilis					1 2 2	1 1						
	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.	OCT.	NOV.	DEC.

Table 3 (3)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Melangyna labiatarum						1 1	6 3 3	1 1 2				
M. lasiophthalma			1 2	2 12	3 1 4							
M. quadrimaculata			3 1 5	3 3 1								
M. triangulifera				1 2	3 4 3	1	1	1 1				
M. umbellatarum				1 1	1 2	4 2 1	1 5	6 18 9	5 1			
Melanostoma mellinum			2 8 21	85 137 137	153 194 135	52 101 199	396 544 349	149 71 27	9 4	1 1		
M. scalare			2 12 25	65 91 75	69 45 36	36 39 76	57 72 66	58 41 19	3 1 1	1		
Merodon aeneus					2							
M. avidus					2 1	1						
M. equestris				8 27 30	89 89 31	13 12 5	4 3 1	2				
M. ruficornis				2		1						
M. rufus				2 3	1 2	5						
Metasyrphus corollae		1	2 3 5	17 27 61	68 51 75	93 100 133	376 578 266	104 36 21	5 7 2			
M. lapponicus			1 2	1 1 3	10 6 4	7 2 6	2 3 4					
M. latifasciatus			3 5	12 10 12	15 26 20	13 11 5	25 41 47	23 9 2	1			
M. latilunulatus			1	1 1	1 2	3 2 1	3 5 3	2 1				
M. luniger			9 11	10 20 8	10 14 9	8 9 14	8 22 28	12 3 4	1 1 1			
M. nielseni					1	3	1 1					
M. nitens					1 2 2	1 1	2 3 1	1				
Microdon devius				1 4	5 9 11	2 1 1	1					
M. eggeri				2 8	14 9 9	6 1 1	1					
M. mutabilis				3 1	3 4 1	1						
Myathropa florea			1 1	1 6 11	25 54 100	154 168 116	78 67 92	73 100 122	38 36 19	6 5 4		
Myolepta luteola					1	1	1					
M. vara					1 1 1							
Neoascia aenea		1	1 9	12 12 63	47 15 2	5 3 1	2	6 1				
N. dispar			1 11	16 755 48	98 81 73	71 38 18	9 24 9	8 5 1				
N. floralis				1	1							
N. geniculata			3	1 39 2	2	3 1 1	1 1	2				
N. interrupta			1	1	1 1		2 2	1		1		
N. obliqua				2 2	4 1	1 1						
N. podagrica		1	3 7 16	57 65 88	55 49 25	23 41 93	68 152 176	125 57 24	1 4			
N. unifasciata					1							
Neocnemodon brevidens ♂♂				1 3 1	2 3	3 2	3 5	2				
N. latitarsis ♂♂				2 1		1	1					
N. pubescens ♂♂			2 2	8 4 4	1 3							
N. vitripennis ♂♂				3 6 3	5 4 3	2 4 6	11 8 6	2 2				
Olbiosyrphus laetus						1						
Orthonevra brevicornis			1	2 24 9	3							
O. elegans				1	1	2 1						
O. geniculata			5 2	4 2 1	3 6	1						
O. intermedia					1		1					
O. nobilis				1 2	3 5 3	5 6 5	7 7 5					
O. splendens				2 1 7	6 14 5	1 1 1	4 14 19	9 5 4	1			
Paragus albifrons					2 1	1 1	1					
P. bicolor					1	1						
P. finitimus				1 1		1	1	1				
P. flammeus								1 1				
P. haemorrhous ♂♂				1 2 1	4 5 4	11 8 13	5 9 8	7 1 1				
P. majoranae				1	1 1 1	1 1	1 2					
P. tibialis ♂♂						1 1	1 1					
Parasyrphus annulatus			1	5	11 6 1	3 2 1	3 2 6					
P. lineola			2	8 7 6	11 8 11	12 20 18	25 14 30	11 12 10				
P. macularis				1 1 4	4 1 1	5						
P. malinellus				8 10 5	9 4 2	2 1						
P. nigritarsis				1 2								
P. punctulatus		1	1 2 8	15 12 15	13 9 9	5						
P. vittiger			1	3 2 1	3 2 1	1 2 5	8 3 4	1				
Parhelophilus consimilis					1							
P. frutetorum				1 11	9 10 2	3 3 2		1				
P. versicolor				5 10	9 4 1	3 1 1	1 2 4	2				
Pelecocera tricincta						1 1	3 2	2 1				
Pipiza austriaca				1 2 9	4 6 5	4 1	9 9 16	3 1				
P. bimaculata				4 10 14	6 4 1	2 1 2	5 1					
P. fenestrata			1	2 7 2			1 1	1				
P. festiva				3 1	2 1		3					
P. lugubris				1 4	2 2 1	3 3	12 17 12	7 2				
P. luteitarsis				1 2 2								
P. noctiluca				8 14 25	12 15 5	3 2	4 13 10	2				
P. notata				1 4	1 2 1							
P. quadrimaculata				1 8 14	26 8 10	7 2 2	3 1 1					
P. signata				1 1		1	1 3 2	1 1				
Pipizella annulata ♂♂				1	2 4	2 3 1	1					
P. divicoi ♂♂				2 1	2 1							
P. maculipennis ♂					1							
P. varipes ♂♂				5 22 23	16 20 23	20 14 28	34 14 14	1				
P. virens ♂♂				3 3 2	13 10 8	3 1 4	10 6 8		1			
P. zeneggenensis ♂♂				2	1 1							
	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.	OCT.	NOV.	DEC.

Table 3 (4)

	I	II	III	IV			V			VI			VII			VIII			IX			X		XI	XII
Pipizella nov. sp.										1															
Platycheirus albimanus			2	13	23	35	82	132	118	82	70	45	105	107	119	92	132	141	108	55	25	1	4	1	
P. ambiguus				2	4	2	5		2																
P. angustatus					1	2	8	19	23	23	22	17	28	21	21	23	48	61	49	12					
P. clypeatus				1	2	10	42	88	80	90	93	72	80	93	107	236	159	76	35	43	1				
P. discimanus				2	4		1																		
P. fulviventris						1	2	6	14	15	5	4	3	6	5	2	9	11	6	3					
P. immarginatus								1	1							2	1								
P. manicatus					3		12	31	48	35	38	29	11	3	5	4	13	13	19	4	6	1	2		
P. ovalis					1	3	13	17	17	10	7	3	1				2								
P. peltatus			1	4	3	9	26	175	306	207	225	177	29	37	18	33	235	341	129	71	22	6	2	1	
P. perpallidus								2					1	2			2								
P. scambus				1			2	10	18	8	9	15	4	3	9	9	27	9	3	2					
P. scutatus				2	6	6	35	69	89	80	70	49	24	32	29	52	70	84	50	55	36	18	6	4	3
P. sticticus						1																			
P. tarsalis				1	1	1	5	6	7	2															
Pocota personata					1																				
Psarus abdominalis									1				1			1									
Pyrophaena granditarsa							1	4	12	22	51	47	57	32	23	35	38	54	23	9	4				
P. rosarum					1		4	4	15	18	15	15	18	26	18	18	17	19	14	2					
Rhingia campestris			3	1	5	20	53	318	656	1086	454	589	219	68	47	59	91	211	275	140	75	28	4	2	2	1
R. rostrata						1					1				1		1			1					
Scaeva pyrastri			1	3	4	5	9	23	29	40	41	24	54	68	114	172	191	119	32	5	4	1		1	
S. selenitica			1	2	5	5	3	5	18	35	30	45	19	11	17	12	17	19	6	3					
Sericomyia lappona							5	10	12	29	8	6	13	9	2	1	1	1	1	1					
S. silentis								1	9	12	15	13	35	13	21	35	49	43	22	30	13	3	3		
Sphaerophoria abbreviata ♂♂							3	12	12	29	8	3	1	1	7	28	14	3							
S. batava ♂♂							1	8	3	4	1		3	3	2	2	6	27	3						
S. loewi													1												
S. menthastri ♂♂					1		1	2	3	5	46	50	17	5	7	5	7	25	9	4					
S. philantus ♂♂							1		2	1	2	2	2	1	2	1	6	3							
S. rueppelli							1	4	1	2	4	6	1	4	2	2	4	8	7	6	3				
S. scripta			1	1	2	1	5	21	41	69	43	54	58	72	203	208	239	304	443	194	41	14	1	1	1	1
S. taeniata ♂♂						1		2	3	6	1	3	6	3	10	7	12	14	8	1	5				
S. virgata ♂♂								1	2	6	6	5	3	1	4	2	2	8	6	2					
Sphegina clunipes						1		3	5	15	13	7	8	6	7	9	4	11	10	2					
S. kimakowiczi								1	1		6	2	1	7	3	6	1	5	4						
S. nigra											6	11			1			1	1						
S. sibirica													2	5											
Sphiximorpha subsessilis									1	1	2	2	1												
Spilomyia saltuum																	1								
Syritta pipiens				2	3	6	9	25	79	109	144	132	78	60	80	94	105	131	117	61	48	32	9	10	2	1	1
Syrphus nitidifrons												1		1											
S. ribesii			1	2	5	33	45	170	179	143	86	87	62	70	76	65	74	109	98	63	32	21	3	8	2	1	
S. torvus			1		11	22	51	55	42	28	26	55	66	26	32	30	32	40	31	21	7	5	1	2		
S. vitripennis				1	3	23	51	101	68	67	47	41	24	41	45	69	88	107	137	67	16	6	2	4	2	1	1
Temnostoma apiforme								1		4		2	1	1											
T. bombylans				1		1			3	12	20	28	12	4	3										
T. vespiforme					1					7	25	22	16	10	6	3									
Trichopsomyia carbonaria ♀♀										1		1		1											
T. flavitarse										1	2	4	3	3	2	3			1						
T. lucida										2	2	2			2	7	3	3	2						
Triglyphus primus										1			2			1	7	11	8	3					
Tropidia fasciata																		1							
T. scita								13	44	35	132	77	42	30	7	2	5	4		2					
Volucella bombylans						3	4	15	59	108	150	98	52	56	33	21	20	8	2		1		1		
V. inanis											2		6	2	6	7	9	7	1	1					
V. inflata									3	1	1	5	4	3	1										
V. pellucens				1	1		2	11	37	72	91	72	66	70	62	56	65	38	7	2	1				
V. zonaria					1			1	1	6	1	5	3	9	15	18	15	9	3	1					
Xanthandrus comtus								2	1	2	3	5	4	2	5	3	3	4	7	4	2	1			
Xanthogramma citrofasciatum				1		3	20	34	37	14	6	1		1	1	1	2								
X. pedissequum								4	7	20	27	32	34	25	26	9	13	26	9	2	1				
Xylota abiens							1		3	4	6	6	6	6	1		2	1							
X. coeruleiventris										4	8	13	8	3	4	2	4	2							
X. curvipes										1															
X. femorata								1	1	2	1	1	3		1	1									
X. florum									8	4	15	27	25	13	11	5	7	2	2	1					
X. ignava										2	3	4	2		4										
X. lenta							1	11	19	20	30	10	3	3	2	2							1		
X. meigeniana											3	5	3	6	8	5	3	4							
X. nemorum					1	1		2	14	14	8	13	11	14	10	8	4	7	3	2					
X. pigra								2		1	1														
X. segnis				1	1	5	9	31	104	175	152	142	88	66	112	95	66	78	84	33	20	10	7	8	1	2
X. sylvarum								1	4	6	21	31	42	35	31	41	23	36	19	4	3	1				
X. tarda										1	2	3	2	1	5	8	10	9	8	1		1			
X. xanthocnema										1	1	3	3	4	7	7	2	6	3						
	JAN	FEB	MAR.	APRIL			MAY			JUNE			JULY			AUGUST			SEPT.			OCT.		NOV.	DEC.

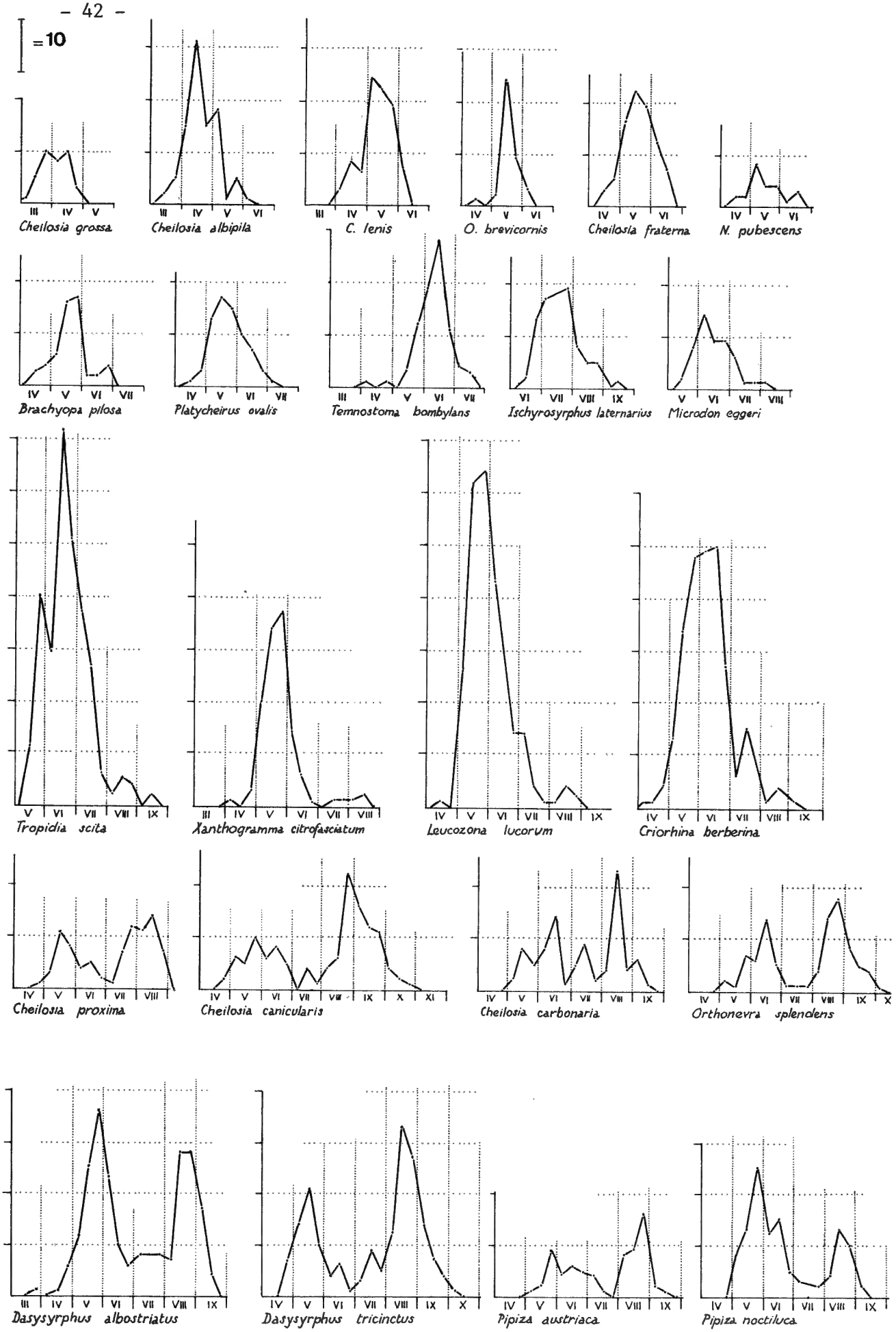

=10
Cheilosia grossa
Cheilosia albipila
C. lenis
O. brevicornis
Cheilosia fraterna
N. pubescens
Brachyopa pilosa
Platycheirus ovalis
Temnostoma bombylans
Ischyrosyrphus laternarius
Microdon eggeri
Tropidia scita
Xanthogramma citrofasciatum
Leucozona lucorum
Criorhina berberina
Cheilosia proxima
Cheilosia canicularis
Cheilosia carbonaria
Orthonevra splendens
Dasysyrphus albostriatus
Dasysyrphus tricinctus
Pipiza austriaca
Pipiza noctiluca

Fig. 2

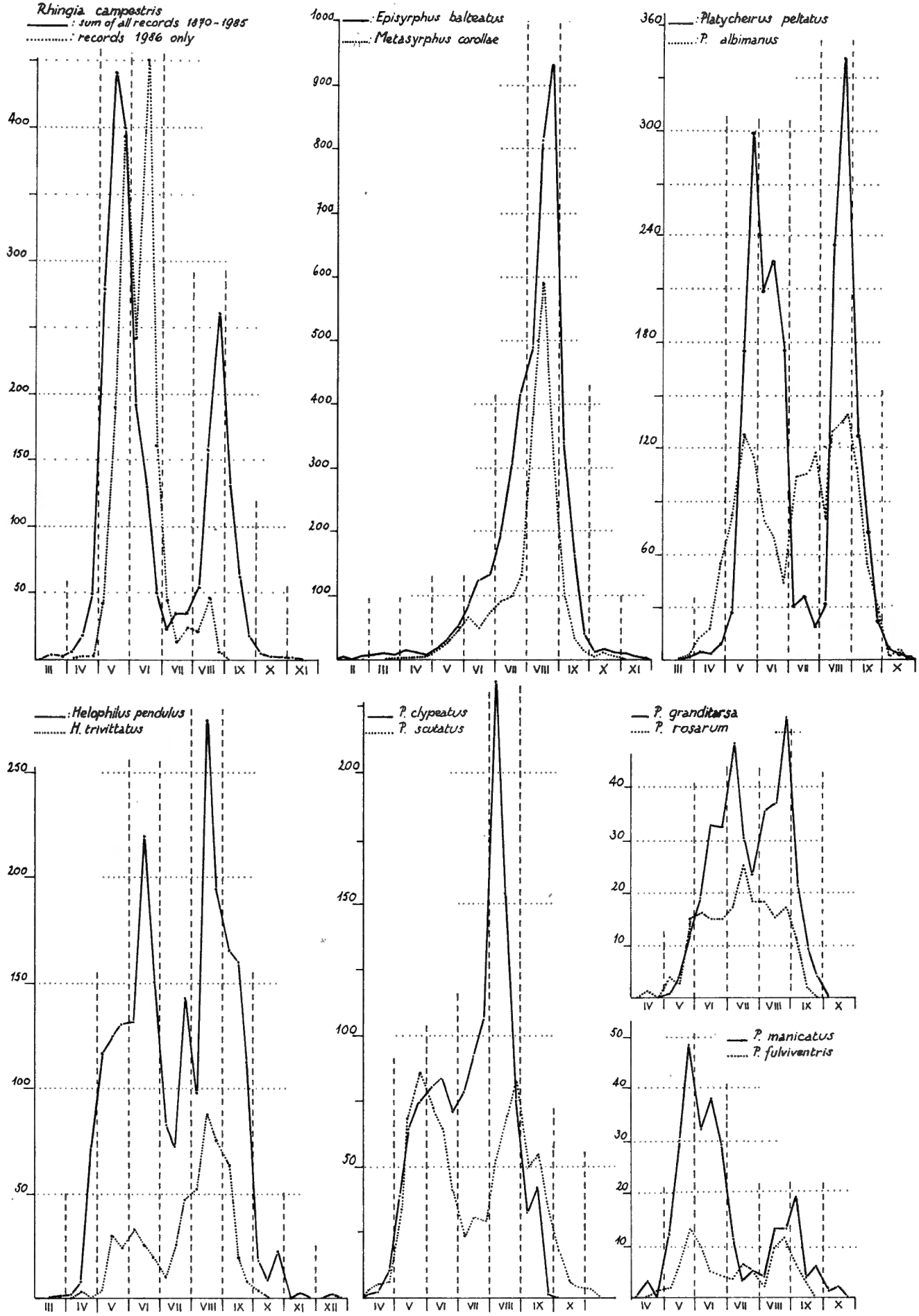

Rhingia campestris
: sum of all records 1870-1985
: records 1986 only
: Episyrphus balteatus
: Metasyrphus corollae
: Platycheirus peltatus
P. albimanus
: Helophilus pendulus
H. trivittatus
P. clypeatus
P. scutatus
P. granditarsa
P. rosarum
P. manicatus
P. fulviventris

fig. 3

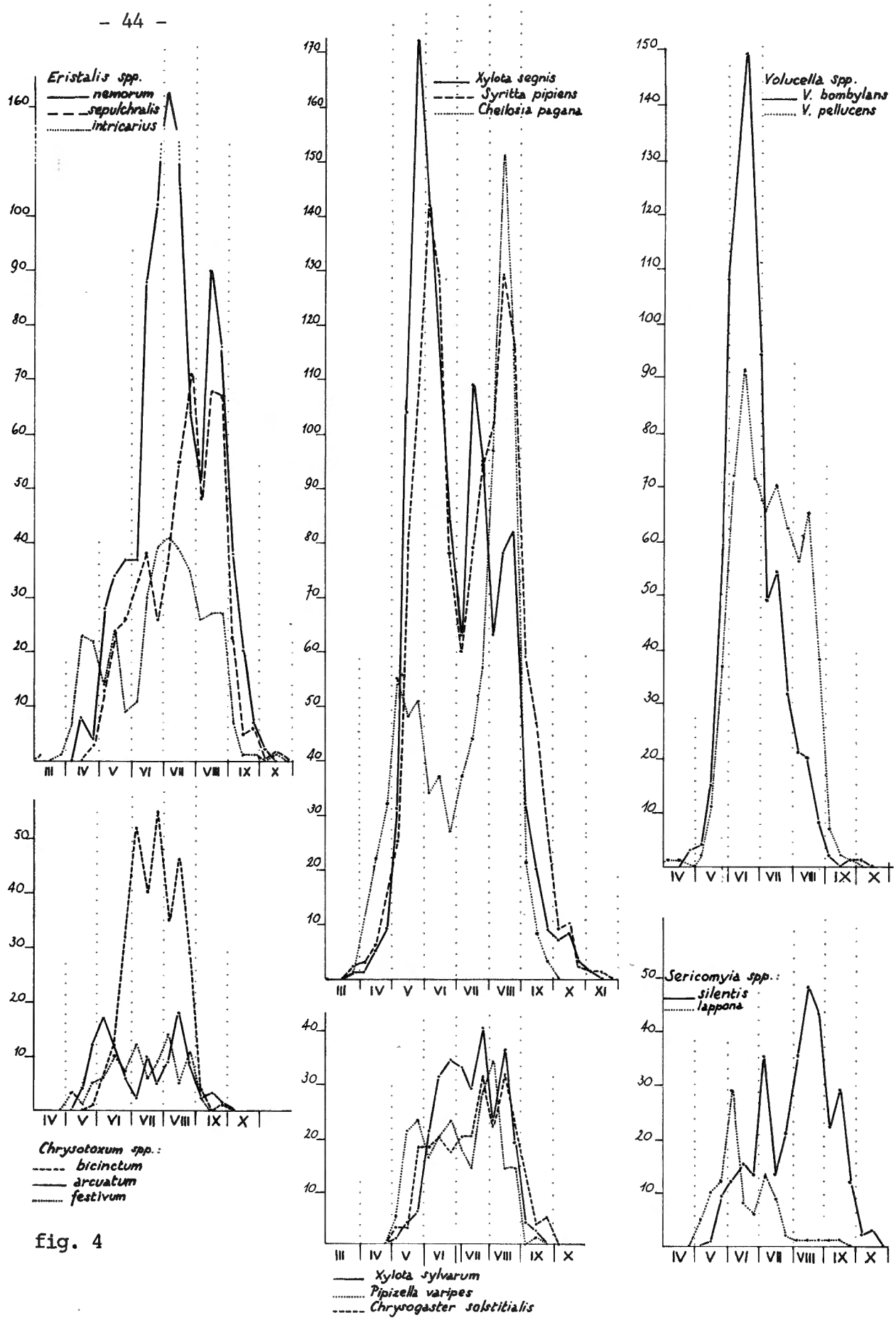
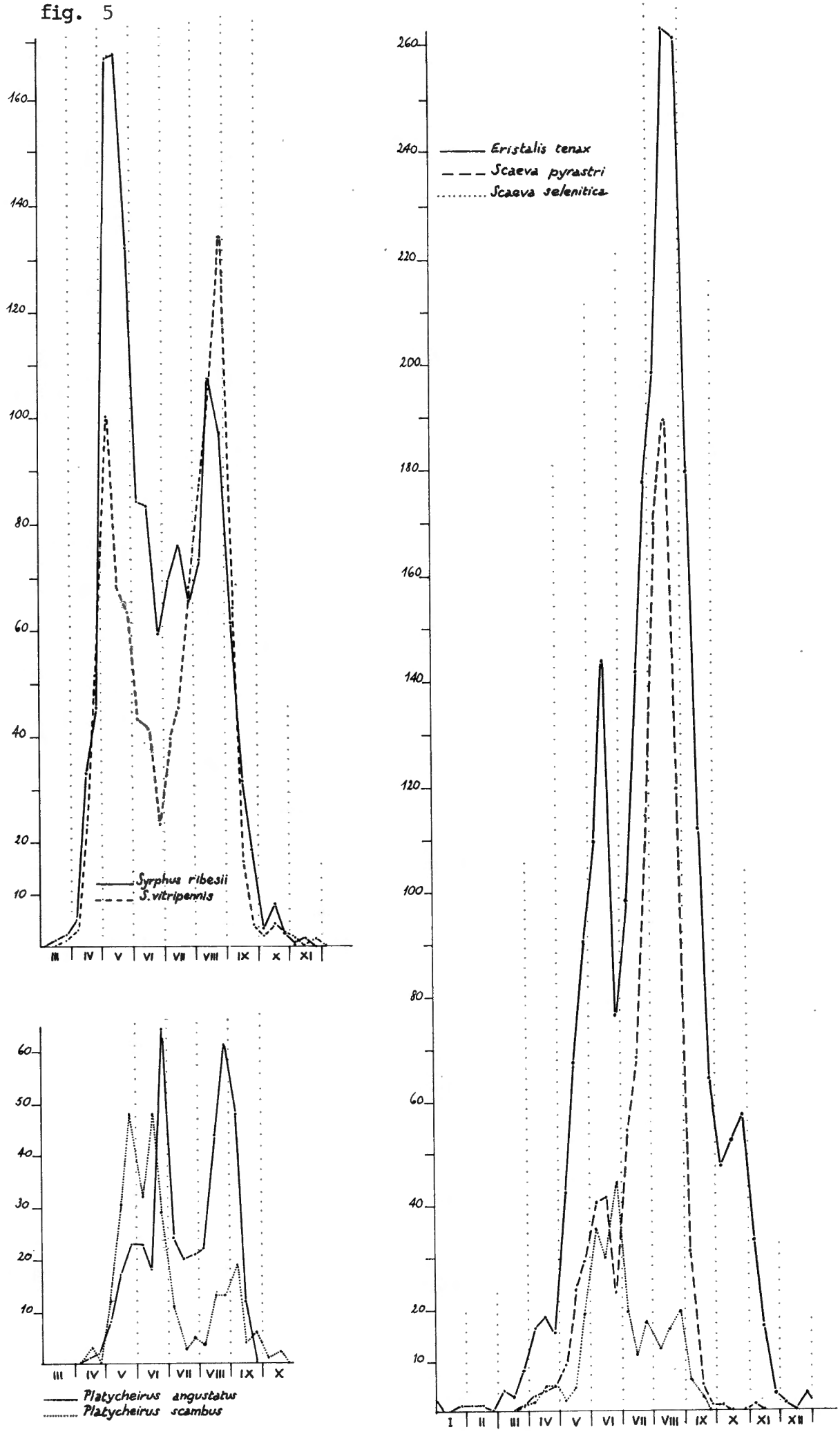

Eristalis spp.
nemorum
sepulchralis
intricarius
Xylota segnis
Syritta pipiens
Cheilosia pagana
Volucella spp.
V. bombylans
V. pellucens
Chrysotoxum spp.:
bicinctum
arcuatum
festivum
Xylota sylvarum
Pipizella varipes
Chrysogaster solstitialis
Sericomyia spp.:
silentis
lappona

fig. 4

fig. 5


Syrphus ribesii
S. vitripennis
Eristalis tenax
Scaeva pyrastri
Scaeva selenitica
Platycheirus angustatus
Platycheirus scambus

c) CLIMATIC FACTORS :

It is obvious that the climatic and other environmental factors that play such important part in determining the geographical distribution of the species (5.2) affect the phenology of the species as well. As each species can only deploy its activities within more or less narrow ranges of a set of physical factors, their flight period must be geared to the time of the year when average conditions are optimal for this particular hoverfly.

As these average climatic circumstances vary so much within the range of most species, it seems almost inevitable that the phenology shows regional variations at least in some species. We therefore thought it might be interesting to compare the flight periods of the same species in different countries of north-western Europe.

Fortunately recent information is available for a number of Syrphidae. T. NIELSEN (1971) published a survey of the hoverflies of Jaeren, a small flat area near Stavanger in S.W.Norway ; CLAUSSEN (1980, 1986) did the same for Schleswig in N. Germany and VdG gives detailed information about the phenology of Dutch hoverflies. Of course Jaeren and Schleswig are much smaller than Nl and B, but there are some important common factors : the four regions are near the sea and enjoy the full influence of the Gulf Stream giving them a moderate maritime climate ; they consist mainly of plains and low hills. The differences in latitude seem the most important distinctive factor. Of course, only those species were retained for comparison about which there was enough information ; species that were rare in any of the four regions had to be excluded.

The histograms speak for themselves. As was to be expected most species appear later and disappear sooner the more one travels north. The pattern is not universal, though, and there are some exceptions. Volucella bombylans, Eumerus strigatus, Myathropa florea and Chrysotoxum festivum appear far more affected by climatic differences than boreo-montane species like Sericomyia silentis. Some must have a high degree of tolerance towards climatic factors as they seem hardly affected at all by the difference in latitude (Syritta pipiens). In most species the differences in length of flight period are quite considerable and the number of broods they produce must vary accordingly.

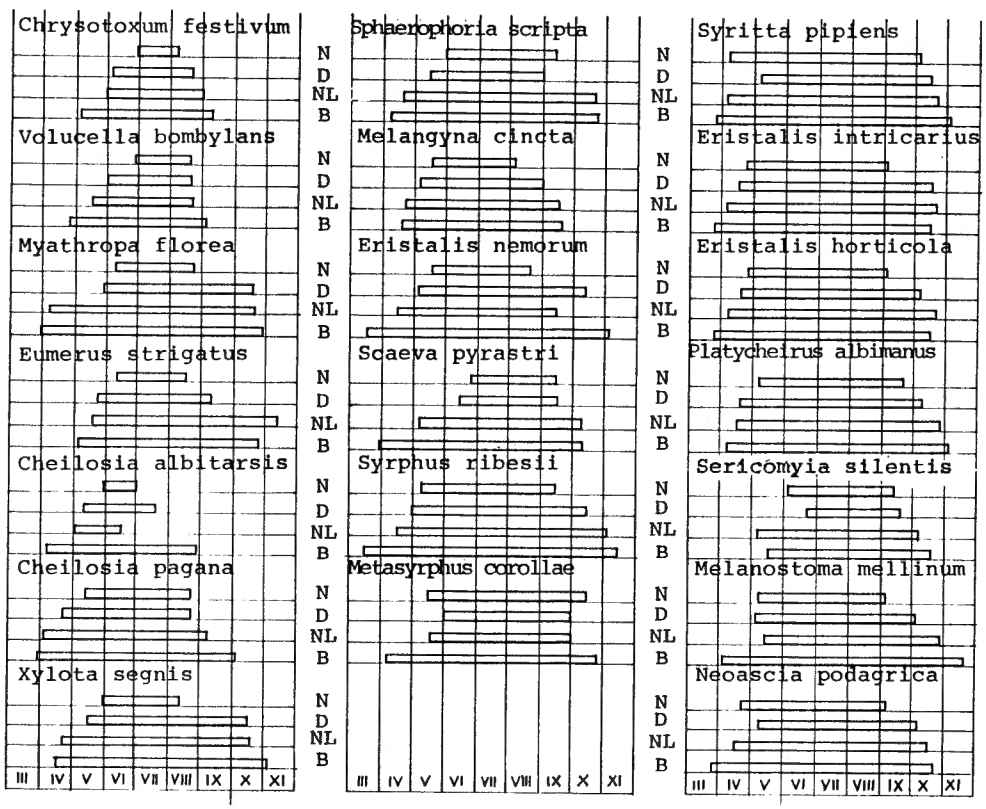


fig. 6 : comparative phenology

7.4. THE HOVERFLY FAUNA THROUGHOUT THE YEAR :

In the course of the year the composition of the active part of our hoverfly fauna changes continuously, both in diversity and in number. In order to illustrate this evolution figures 7 and 8 have been conceived. All the necessary information is summarised in Table 3, but it would be difficult to gain a clear picture from this mass of figures.

Fig. 7 shows three aspects of the yearly evolution :

- diversity : The full black bars represent the number of species that have been recorded in each decade. The pattern is asymmetrical. The winter months are negligible, but at the beginning of March the first species may appear (depending on the weather, of course). Diversity increases sharply till the beginning of May ; it continues to rise less steeply until a maximum of diversity is reached in the first decade of June. From then on the number of active species follows a downward trend, but it is fairly gradual and quite irregular. There are even three small temporary increases : these represent the reappearance of some bivoltine species after their early-summer diapause. Diversity starts falling more steeply from mid September onward and by the end of November hoverflies have virtually disappeared.
- numbers : The overall number of records for each decade is represented by the white bars. This pattern is even more asymmetrical. It is not until April that a significant number of hoverflies appears. Then numbers rise very steeply till a first maximum is reched in the final decade of May. At the beginning of July overall numbers have slumped considerably : barely half the figure that was attained late May. As summer proceeds numbers increase again and the absolute maximum is reached mid August. The following decline is spectacular, but may in fact be exaggerated as entomologists tend to end their field activities in September. When the autumn weather allows it there is still a noticeable degree of activity in October, but after the first November days the hoverfly season is virtually over.
- Because of the disparities that appeared in diversity and numbers a third parameter was introduced : the average number of records per species. In late spring diversity and numerosity run more or less parallel, but the second and more pronounced activity peak in August is not due to a rise in diversity. During the summer peak the number of species is only two thirds of the early June number, while the total number of records is a lot higher. This phenonemon is caused in part by the mass invasion (Metasyrphus corollae, Episyrphus balteatus, Eristalis tenax) for the rest by the maximum activity of some very common species (Sphaerophoria scripta, Cheilosia pagana,...). This part of the graph clearly shows that species occur in number only between late April and late September.

The most interesting feature of fig. 7 is the pronounced slump in activity in early summer, which is caused by a drop in diversity, but far more by a drop in numbers. The phenonemon is, of course, quite familiar to field workers. In the plains and on the low plateaux this drop is probably even more spectacular than the graph shows : in the southern half of the country it is less conspicuous and it may happen a few weeks later (climatic differences).

What is not at all clear, however, is the cause of this sharp decline. GOELDLIN (1974) thinks it is the abrupt end of spring flowering (woodland flowers, fruit trees, flowering bushes, hay meadows) which probably triggers off large-scale migrations as well. Indeed in the northern half of the country there are fewer flowers than in spring, and the umbels are not yet available as main food source. Another possible explanation lies with predation by birds, which about that time have to feed their young. If so, it is not clear whether it is the predation itself that decimates numbers, or a strategy developed by some hoverflies : a number of species (especially univoltine spring species and bivoltine hoverflies with an obligatory diapause) cease their activities just then. The disappearance of these species is not the whole explanation , however. Many common species do not cease activities but become noticeably scarcer, though this is partly compensated by the fact that summer species (many Xylota, Cheilosia illustrata, Chrysogaster solstitialis,...) attain maximum numbers just then.

It might be put forward that climatic reasons are responsible for the early summer slump ; after all this is the period of maximum sunshine and hoverflies prosper most in temperate climates. Is the life-cycle of many species adapted to avoiding this period ? Statistics show this can hardly be an important factor : the differences in temperature, rainfall, etc. between June, July and August are small, if not negligible.

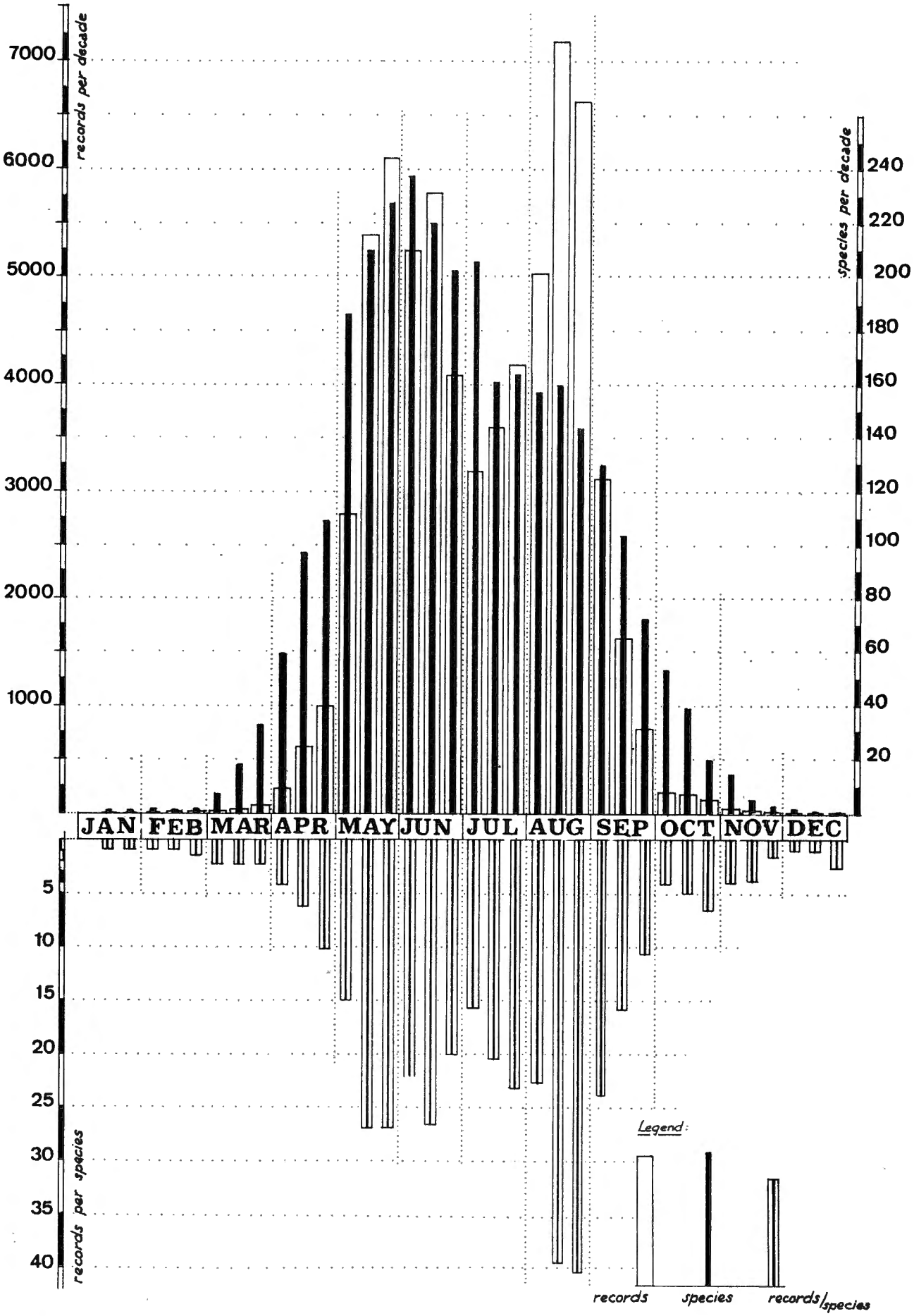


Fig 7 : Evolution of the hoverfly fauna throughout the year (1)

Fig. 8 gives yet another aspect of the phenology of our hoverflies. The white bars show for each decade the number of species that make then their first appearance of the season. As far as possible exceptional records (freak eclosures triggered off by abnormal weather) have been eliminated. The black bars represent the number of species in each decade that are recorded for the last time in the course of the year.

This graph does not bring any new spectacular fact to light, but it shows how important it is to start early when it is the intention to make a full inventory of the hoverfly fauna of a certain site. By the end of April a number of species have already completely disappeared from the scene : Melangyna quadrimaculata may already have disappeared before the end of the first decade in April when the weather is clement in March. Other species that may have gone before May are : Cheilosia grossa, Platycheirus discimanus, Criorhina ranunculi. By late May some 25 species have finished their flight period, 40 more disappear before the end of June.

It is interesting to note that after mid July not a single species will make its first appearance for the year, and the two entries for mid July are probably incorrect : they concern extreme rarities which were either strays or may occur earlier in the year too, though they have not then been taken yet. Fig. 8 shows clearly that hoverflies are essentially spring insects, even though some may still be about early November. Particularly impressive is also the number of species first appearing early May.

As in fig. 7 this histogram also shows the irregularities in diversity in the period between late June and late August. This is easy to explain : in general the number of species is falling steadily, but a number of bivoltine species reappear at the same time. Some of the irregularities may of course have been brought about by the lack of sufficient data about some rare species.

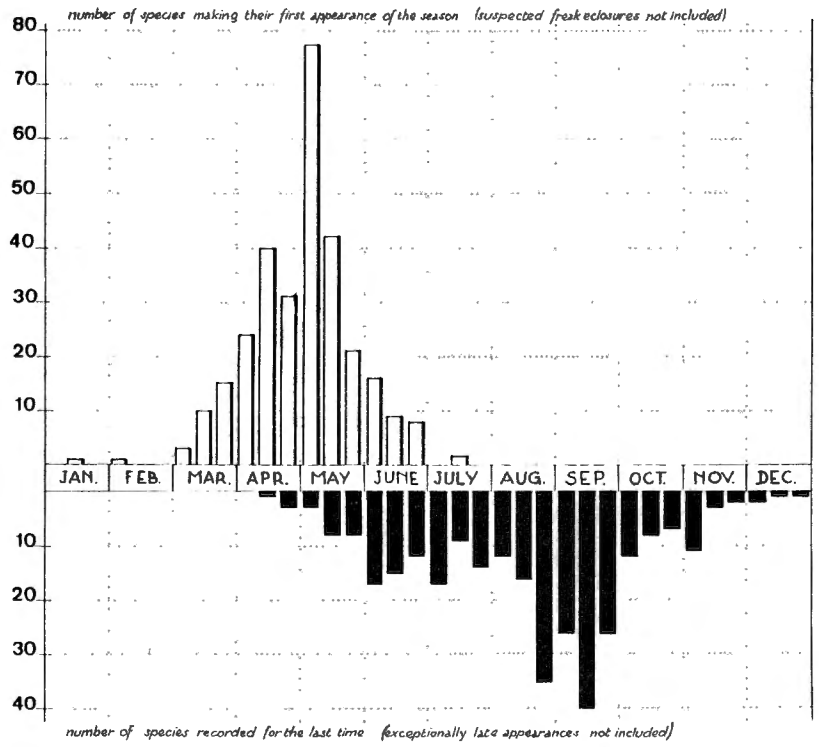


Fig. 8 : Evolution of the hoverfly fauna throughout the year (2)

8. CONSERVATION

8.1. THREATENED SPECIES : INTRODUCTION

One of the principal purposes of the present study was to find out which hoverfly species have become noticeably rarer in the course of this century. Hence our preoccupation with rare species.

Once more LECLERCQ et al. (1980) will serve as point of departure. In this analytic study a formula was adopted to define which species had dropped in number since 1950. If the number of squares in which a certain insect had been recorded only before 1950 exceeded the number of squares where it has been taken since that year by 10 units, then it should be considered to be in regression.

If this criterium is applied to our hoverfly data only 3 species will be concerned : Arctophila fulva (26 sq. before 1950, 15 since), Xanthandrus comtus (22 and 12 respectively) and Chrysotoxum elegans (14 and 2). If we could believe that less than 1 % of our hoverflies were threatened this would be excellent news. Indeed, the destruction or degradation of habitats is usually seen as the major cause , and if insects that are so narrowly linked to certain habitat types had been able to survive the onslaught almost unscathed,that would be quite reassuring.

But is this so ? We are afraid not. J. LECLERCQ's formula deliberately excluded species of which fewer than 10 records were known. He considered such species as so rare that they had probably always been rare ot at least so elusive that records were not reliable. He was probably right there, but let us not forget that far more than half the records used for the first 1600 maps of the "Atlas" dated from before 1950. Such records form a tiny proportion of the records used in this study. If there had been enough collecting of Diptera before 1950 we would have adopted the same criterium ; as things are it would be nonsense to eliminate all species of which there are fewer than 10 pre-1950 records as "extremely rare" or "elusive".

This disequilibrium between older and more recent data forces us to adopt another criterium : whenever the number of squares where the species was seen before 1950 only is greater than the number of squares where it has been recorded since, we think the species is endangered. Species known from fewer than 10 squares cannot be excluded, but each case will be considered individually. Until more older records are unearthed we shall have to proceed in this subjective and possibly unscientific way.

The following "red list" should be interpreted therefore with some reserve. Considering the strict dependence of many hoverflies on certain biotopes (e.g. some types of wetland) the radical changes in the environment must have had a harmful effect, especially in the part of the country north of the Sambre-Meuse valley : regions like the Kempen have changed beyond recognition within a lifetime. Moreover, evidence from other countries points in the same direction : some of the species in the "red list" have recently disappeared there as well (CLAUSSEN, 1980 ; VdG81, STUBBS, 1983)

8.2. A LIST OF HOVERFLY SPECIES WHICH MAY BE THREATENED OR EVEN EXTINCT :

- Anasimyia lunulata : A northern bog species (CLAUSSEN + TORP, 1980), rare in B and NL and probably extinct in Schleswig. Latest records here 1956 and 1959. The closely allied A. interpuncta is still prospering.

- Brachyopa insensilis : was last recorded 1950. There are a fair number of recent captures of all Brachyopa except insensilis. According to CLAUSSEN (1986) it depends on elm trees for its survival. The rapid disappearance of this tree species owing to the Dutch elm disease is surely responsible for this regression.

- Ceriana conopsoides : Up to 1956 there were a fair number of records of this large handsome species of ancient woodland ; since then there has been 1 record only, in 1974.

- Chamaesyrphus lusitanicus and C. scaevoides : both are mainly heathland species and they were rarely recorded here even before 1950. It is certainly even scarcer now because of the rapid degradation and destruction of our heaths.

- Arctophila fulva : Though this large fly might be mistaken for a bumblebee the scarcity of recent records (not squares !) justifies anxiety about its status now. There have been only 14 records since 1950 as against 50 before. There has been only one record from the northern half of the country since 1950 and even in the south it may have become much rarer except in the Hautes Fagnes.

- Chrysotoxum elegans : a species that used to occur locally all over the eastern half of the country, but has probably disappeared now. The only post-1950 records (Dirbach (KA.83) 1954 and Lubbeek (FS.23) 1957) have been taken over from the "Fichier de Gembloux" ; the material has not been found. Anyway, even these two unsupported records are now 30 years old.

- Chrysotoxum intermedium : all but one of the records on this southern species date from 1901, when there may have been an invasion. The single recent specimen (Sombreffe (FR.19) 1976) was identified by C. FASSOTTE ; this specimen has not been found, either. It is significant that it was taken in the notoriously hot and dry summer of 1976 !

- Chrysotoxum octomaculatum : a psammophilous species, rarely recorded even before 1950, which must have suffered from the rapid disappearance of most of our heathland. It certainly survives near Châtillon (FR.90) ; all other records date back at least 30 years.

- Doros conopseus : this large handsome species has probably always been pretty scarce; as the latest known capture dates from 1960 (N. DE BUCK, leg.) it may now have disappeared altogether.

- Eristalis alpinus : a rare continental bog species, which must be virtually extinct now. The only record since 1943 is from Bévercé (KA.89) 1963 ; the material was not seen by the authors. The Hautes Fagnes region has been thoroughly sampled since, but no specimens of alpinus have turned up.

- Eristalis cryptarum : extinct ; not taken since 1912.

- Eumerus sabulonum : The only recent record is from Knokke (Zwinbosjes), one of the few sites in the sea-dunes which is still relatively intact. The species has not been mentioned from inland sites since 1958.

- Lejops vittata : This halophilous species must always have been limited to a few sites in the Maritime district. A. RYCKAERT found it still numerous at Westkapelle (ES.28) in 1949 and it was taken at De Panne (DS.76) in 1963, but intensive sampling near the coast and downstream from Antwerpen has been unsuccessful. Probably extinct.

- Microdon mutabilis : apart from a large series taken near Spa (GR.09) there have been no records for 20 years, whereas the other two Microdon species still appear prosperous.

- Orthonevra elegans : though it is very small this wetland species is unmistakable. It may always have been local, but now it may be extinct. Even the latest literature record (Hautes Fagnes) dates back 35 years.

- Orthonevra intermedia : is only known from 2 records and must have been very local in the past, too. The water quality of the sort of pools where it used to occur has badly deteriorated these last decades, and, though the allied O. geniculata still prospers, intermedia must be feared extinct.

- Paragus bicolor, Paragus flammeus : the only records are now almost a century old, so their chances of survival must be considered very slender.

- Parhelophilus consimilis : known from two sites only this wetland species has not been recorded since 1949 (A. RYCKAERT) and may now be extinct.

- Pelecocera tricincta : a small psammophilous species known from old records in the north (heaths !), where it has not been recorded since 1956. There is a very recent record though from FQ.88, just across the frontier near Torgny.

- Platycheirus perpallidus : another endangered wetland species, which probably still survives locally, but must have suffered from drainage and pollution. It failed to turn up when sites where it was known to occur were thoroughly explored.

- Psarus abdominalis : A rare species (last recorded 1937)which, like Rhingia rostrata seems to have disappeared from ali countries in north-western Europe.

- Rhingia rostrata : Though it may survive in a few localities (there is a recent record from NL) this once prosperous species became rare already last century. The latest reliable record from B is now fully 70 years old. It was mentioned in the literature from the Hautes Fagnes circa 1963, but this could not be substantiated.

- Sphaerophoria menthastri : In NL this has become the rarest of the menthastri group (VAN DER GOOT, pers. comm.). In B it can still be seen in number in the southern half of the country, e.g. along woodland streams and rivers. North of the Sambre-Meuse valley it has virtually disappeared and may survive only near some ponds and in the upper reaches of lowland streams,which are still relatively unpolluted. All but two records from the plains and low plateaux are now 30 years old.

- Xanthandrus comtus : In contrast to GB, where the species became scarce round the turn of the century, there are a fair number of records until 1950 in B and NL. Then the species virtually disappeared from both countries and it was not till the end of the nineteen-seventies that single specimens were taken again. It still seems less prosperous than in the forties when large series were taken (J. VERBEKE, M. GOETGHEBUER, leg.)

CONCLUSION : At least 26 species (± 8 % of our hoverfly fauna) seem to have become extinct, virtually extinct or at least much rarer and more local in the course of these last 30 - 40 years. For a few (Rhingia rostrata, Psarus abdominalis, Eristalis cryptarum) deterioration must have set in much earlier, at the beginning of this century or even further back.
It must be emphasised that the number of threatened species may be greater. The distribution of Diptera was until recently much less documented than Coleoptera, Lepidoptera and Odonata, which were collected by far more entomologists.
In most cases it is apparent that the changes in land use,(the mania for drainage of waterlogged areas, the pollution of surface waters, the disappearance of heaths and other semi-natural habitats, and above all the generalised application of techniques in agriculture and forestry that only aim at greater production) are to blame. In the northern part of the country where these changes have been applied most ruthlessly the entomofauna has suffered most ; the situation is a little less serious in the centre and far more favourable in the south.

8.3. POSSIBLE NEWCOMERS TO THE BELGIAN HOVERFLY FAUNA :

While there are a number of hoverflies which have not been taken for the last 40 or 50 years (8.2) far more species are known from recent records only : like in NL more intensive collecting by more naturalists resulted in the discovery in the field of species that had never been taken before. Cheilosia acutilabris, Epistrophe melanostoma, Melangyna compositarum, Merodon aeneus, Metasyrphus latilunulatus, M. nielseni, Syrphus nitidicollis, Trichopsomyia lucida, Neoascia interrupta and many more have all been taken for the first time here since 1950, some only these last few years. All of them are rare of very local, or they had been overlooked for various reasons (6.2). It may safely be assumed that they occurred here before 1950, too.

Two or three species may be relative newcomers, however, having extended their range into this country in fairly recent times. In contrast to the species named in the previous paragraph they are now frequent here and their range covers the whole country or a large part of it.

- Eristalis abusivus : This is not a newcomer to this country, but it is just possible it has extended its range considerably in recent times. There are 4 old records (DS.86,1914 ;FS.08,1895 ; FS.29,1918 ; FS.58, 1922) : all these are in the extreme north of the country. No further records are known from other parts of the country till 1963. Yet there have been over 200 records since and the species is known from all over the country, though it is more numerous in the north-west. It may have been overlooked because it is almost indistinguishable from the common E. arbustorum in the field. It seems just possible, however, that it has extended its range in the last 30 - 40 years.

- Helophilus hybridus : In the Maritime District and West-Vlaanderen this is now quite a frequent species, though in the rest of the country reocrds are scarce and concern single specimens only. Yet the oldest known specimens were taken In 1945 and 1948 (FS.81 , FS.82). In the collections of M. BEQUAERT, M. GOETGHEBUER, J. VERBEKE, L. MARNEF, J. BASTIN, who had been active 1910 - 1960 in the region where hybridus is not at all uncommon, not a single specimen has been found. A. BARENDREGT (in litt.) suspects a similar phenonemon has taken place in NL in recent times.

- Platycheirus ovalis : Like in most other countries of N.W. Europe this peltatus-like fly has only recently been recognised here. Moreover no material could be found in I.R.S.N.B. In fact the oldest known specimen dates back to 1947 only (FR.46).There are now 74 records and it is known from most of the country, except the far north. It is difficult to believe that older collectors may consistently have overlooked this species for so long. The matter is at present being investigated by P. LASKA (Olomouc).

8.4. FREQUENCY CLASSES ; AN EVALUATION METHOD :

8.4.1. Purpose : Conservationist associations, universities and even government institutions have busily been surveying our remaining natural assets. So far evaluation was based mainly on vegetation and avifauna ; insects played only a subordinate role, not through lack of interest, but because no evaluation standards were available.

The present study as well as similar surveys on other insect groups now offer the opportunity of involving the entomofauna of a given site in the business of evaluation. Syrphidae are particularly suitable for this purpose : their presence is always ecologically meaningful.

8.4.2. Frequency classes : Now we have a fair idea of the relative numerousness of our hoverfly species it has become possible to divide them into frequency classes. The inspiration for this comes from BARENDREGT (1975), who devised an evaluation method applicable to the greater part of NL. Because of the considerable differences between the Belgian and Dutch Syrphid faunas his criteria had to be adapted to local circumstances. There are other differences, too : frequency classes have been based on the number of U.T.M.-squares in which a species has been recorded, whereas BARENDREGT's system relies on the number of records ; there are also some minor technical differences.

Our 314 species have been grouped in 10 frequency classes :

class 1 :	species known from 225 (=15^2) squares or more	: 12 sp.	(very) common and widespread species
class 2 :	" " " 169 - 224 squares	: 14 sp.	
class 3 :	" " " 121 - 168 squares	: 9 sp.	
class 4 :	" " " 81 - 120 squares	: 27 sp.	frequent species
class 5 :	" " " 49 - 80 squares	: 29 sp.	
class 6 :	" " " 25 - 48 squares	: 55 sp.	infrequent species
class 7 :	" " " 16 - 24 squares	: 32 sp.	rare or local species
class 8 :	" " " 9 - 15 squares	: 40 sp.	
class 9 :	" " " 4 - 8 squares	: 45 sp.	
class 10:	" " " 1 - 3 squares	: 50 sp.	

The following diagrams illustrate the relative importance of these classes and the frequency of each species respectively.

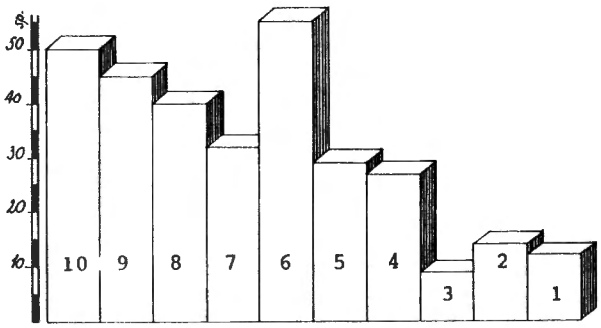


Fig. 9 : Frequency Classes : number of species

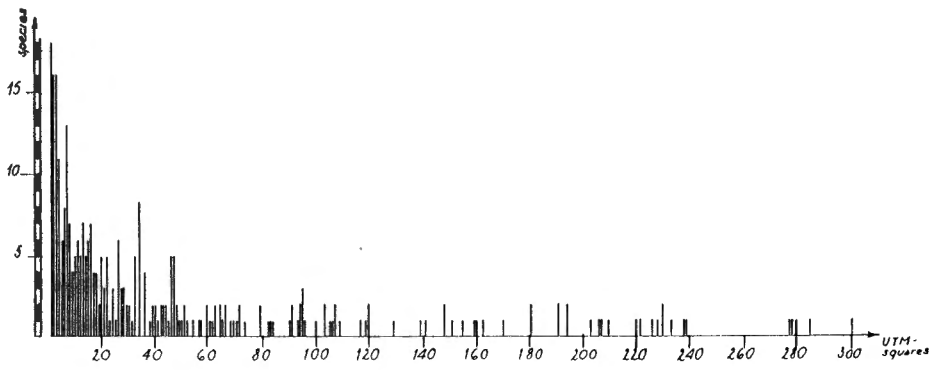


Fig. 10 : N. of species recorded in 1, 2, 3, 4 ... 301 U.T.M.-squares

8.4.3. Method :

A thorough survey of the hoverfly fauna of a site is, of course, a primary condition : two or three hasty samplings will not do. Ideally a site should be explored over a long time (at least two or three seasons) to compensate for the population fluctuations from year to year that are so characteristic for many hoverflies. All habitat types (wet, dry ; sunny, shady ; wooded parts, carr, grassland, ...) should be surveyed. Sampling should be done in all seasons, at various times of the day, in different weather circumstances. The traditional butterfly-net is still the best instrument, but one or more Malaise traps, coloured dishes and sweeping should be used, too. These do not only enable us to catch additional species, but also supply quantitative data.

When the species list has been drawn up, each is allotted a value that corresponds with its frequency class, which is listed in table 1. Brachyopa pilosa, for instance gets 7 ; Caliprobola speciosa 6 ; Cheilosia soror 9, etc. (Species belonging to classes 1 and 2 should both be allotted 2). The numbers are then simply added up and the sum is divided by the total number of species. The following example, comparing three hypothetical woodland sites, will make the procedure clear.

Site 1 :		Site 2 :		Site 3 :	
Baccha elongata	4	Baccha elongata	4	Brachyopa bicolor	8
Brachyopa scutellaris	7	Brachyopa pilosa	7	Cheilosia albitarsis	2
Brachypalpus valgus	9	Brachyopa scutellaris	7	Cheilosia antiqua	7
Caliprobola speciosa	6	Ceriana conopsoides	7	Cheilosia bergenstammi	6
Cheilosia albipila	5	Cheilosia albitarsis	2	Cheilosia fasciata	9
Cheilosia albitarsis	2	Cheilosia argentifrons	9	Cheilosia lenis	6
Cheilosia carbonaria	6	Cheilosia chlorus	6	Cheilosia maculata	8
Cheilosia illustrata	3	Cheilosia chrysocoma	6	Cheilosia mutabilis	6
Cheilosia lenis	6	Cheilosia fraterna	6	Cheilosia pagana	3
...		...		...	
Xylota abiens	6	Xylota nemorum	6	Xylota meigeniana	7
Xylota segnis	2	Xylota segnis	2	Xylota nemorum	6
Xylota sylvarum	4	Xylota sylvarum	4	Xylota segnis	2
Xylota xanthocnema	8	Xylota tarda	7	Xylota sylvarum	4
86 species sum : 388		74 species sum:332		68 species sum : 297	
evaluation: $\frac{388}{86}$ = 4.51		evaluation: $\frac{332}{74}$ =4.48		evaluation: $\frac{297}{68}$ =4.36	

Interpretation : though the total number of species differs considerably the three sites are almost equivalent.

In this form it is obviously a rough-and-ready method, probably only suited for comparing similar sites within the same district. It will not be too difficult to introduce a number of refinements :

- a high degree of diversity might be appreciated by adding a certain amount to the original sum. This should be carefully worked out. If a total of 72 species were found in a region with a poor overall Syrphid fauna, this would be a high degree of diversity. In such region 50 might turn out to be the average total of species in a valuable site ; then it would be fair to add 22. In the eastern half of the Brabant district a total of 72 would be quite normal and no bonus ought to be added. It is obvious that quite a number of surveys must be available before an acceptable norm can be worked out. And diversity is not always a merit in itself : a garbage tip may contain more species than a dry heath.

- a bonus might also be given if a rare species is present in large numbers so that it may be assumed that the species has really settled there or needs the site for foraging.

- the regular presence of a species some distance beyond its normal range, for instance Orthonevra splendens and Cheilosia canicularis at Antwerpen, almost 40 km beyond the limit of its distribution here, ought to be incalculated, too. So ought the recording of species which are known to be endangered in the whole of the territory or in the region where the survey has been made. Any record of e.g. Arctophila fulva north of the Sambre-Meuse divide is extra valuable. In this case the normal coëfficient of 6 should at least be doubled.

II. SPECIFIC PART

1) Anasimyia contracta :

This is apparently a northern species. In DK, for instance, it is somewhat more frequent than its closest relative, A. transfuga (CLAUSSEN + TORP, 1980). In this country, as in NL (BARENDREGT, 1981) it is much rarer. Only 5 specimens are known from B, the 3 recent ones all from the Maritime District. They were taken between mid June and early September.

2) Anasimyia interpuncta :

A fairly widespread wetland species which may locally be numerous in marshes and near open water, but has so far only been taken in the northern half of the country. Its flight period stretches from mid April to late August, but it is far more numerous in spring (May and early June) than in summer.

3) Anasimyia lineata :

This is the most common and most widespread species of the genus, though the number of records from the southern half of B is quite limited. Numbers appear to fluctuate strongly from year to year, but this is, of course, not all that unusual in Syrphidae.
Mid April - mid September, most numerous late May and June.

4) Anasimyia lunulata :

Most literature references to this northern species concern in fact A. interpuncta. Only 4 specimens of this rarity are known from B, exactly the same number as in NL (BARENDREGT, 1981). Two were taken in the Kempen : Zutendaal and Genk (FS.74) 8.8.1890 and 27.5.1905 respectively. B. VAN DE PITTE discovered two recent specimens in the R.U.G. collection : Steendorp (ES.86) 19.4.1959 ; Nieuwdorp (?) 3.6.1956.

5) Anasimyia transfuga :

This dark narrow species is, according to STUBBS (1983) associated with Typha. Though this plant occurs all over the country, there are only three records of transfuga from southern B.
Early May - late September, with three (minor) peaks : mid May, mid June, and August.

6) Arctophila bombiformis :

This large Bombus mimic can be seen in number, often on flower heads of Succisa pratensis in stream valleys and boggy clearings in the large Ardennes forests. Apart from a single old record (stray ?) from the centre it has been taken only in the south-east. This handsome fly is probably less frequent than it used to be : there are only 33 records after 1949, as against 65 before 1950 ; in 14 U.T.M.-squares it has not been recorded since 1949, either. This may be due to the planting of conifers on the marshy grassland bordering streams.
Records range from early June till early October, but it is mainly a summer species, most numerous late July - early September.

7) Arctophila fulva :

Another bumblebee mimic, mainly associated with bogs and marshy grassland. In contrast to A. bombiformis which is still frequent in the south, A. fulva appears to be seriously threatened. It was recorded in 26 squares before 1950 and in only 15 since. Even in parts where it used to be fairly frequent before, it has become noticeably rarer. And from the country north of the Sambre- Meuse valley only one recent capture is known : Gaasbeek (ES.83).
Late April - early November ; 70 % of the captures between mid August and mid September.

8) Baccha elongata :

This most slender hoverfly of atypical habitus is fairly common and widespread all over the country, occurring in all kinds of wooded habitats, gardens and orchards included. Except in cool weather it is rarely seen in the sunshine. Its preference for deep shade explains the rather limited number of records.
Early April - late October ; peaks : mid May - early June, and again mid July - early September.

9) Blera fallax :

As a typical mountain species it belongs to the south-east. Even here it is apparently quite local, but in some places it is taken repeatedly.
Mid May - early July, plus a single mid August record.

10) Brachyopa bicolor :

Judged by the limited number of records all Brachyopa species would be thought to be rare. One or two certainly are ; the others, however, are more numerous and widespread than maps 10 - 16 indicate. They seem to be taken only by experienced collectors and in Malaise traps. The flies are not only small and inconspicuous, their habitus and colouration are quite untypical. They may be seen on flowers (Prunus spinosus !) and leaves, it is more rewarding to look for them at the foot of (diseased or damaged) tree trunks, also in deep shade.
B. bicolor is - or used to be, for recent records are scarce - one of the commoner and more widespread of the genus. There are records from many parts of the country, so it may be generally distributed. A spring species.

11) Brachyopa insensilis :

Because of its association with the rapidly disappearing elm tree (CLAUSSEN, 1986) insensilis must be the rarest of the genus now. There are only 4 records in all and even the most recent one dates back to 1950 : Rochefort (FR.55). Spring.

12) Brachyopa panzeri :

The literature references to B. dorsata, which is now known not to be indigenous, probably concern panzeri, but we cannot be sure. Though known from 6 localities only, abundant Malaise trap catches suggest it may locally be quite numerous, in deeply shaded forest habitats in the south-east of the country.
Early May - late June.

13) Brachyopa pilosa :

Together with the next species this is probably the most frequent and widespread Brachyopa, particularly in humid forest.
Mid April - late June, eclosure and peak period presumably depending on the weather conditions.

14) Brachyopa scutellaris :

It is usually taken together with pilosa and probably equally widespread and numerous, or even more so. Even the flight period appears identical.

15) Brachyopa testacea :

Until the revision of the genus by C.F. THOMPSON (1980) Brachyopa specimens with a plumose arista were labelled "conica" PANZER. Probably literature references of conica usually concerned testacea, which seems to be more frequent and widespread than the other indigenous species with a plumose arista, B. vittata. So far testacea is known from the south-eastern quarter of B, but it might have a somewhat greater range (cf. Dutch records).
Early May - late July. The July records are from the highest plateaux, where eclosure may be retarded because of the harsher climate there.

16) Brachyopa vittata :

Our largest Brachyopa is probably also the one with the most restricted range. All 5 records are from a very limited area in the Hautes Fagnes above 600 m. It is not a mountain species, however,as it was taken in the Dutch Veluwe (A. BARENDREGT, in litt.), hardly above sea-level.
Belgian records range from 30.6 till 17.7, which is late for a Brachyopa. The Dutch specimens date from early and mid May ; in the Italian Alps it is also on the wing mid May; W. BARKEMEYER (1986) quotes dates between 11.5 and 16.7.

17) Brachypalpus eunotus :

This woodland species is known from one locality only : Mirwart (FR.64) 10.5.1950 and 15.5.1950.

18) Brachypalpus laphriformis :

Even about the most frequent of our Brachypalpus very little is known. This rather convincing honeybee mimic may be more widespread than is actually known : it was taken in 3 different Malaise traps, which can hardly have been coincidence.
Late April - mid June.

19) Brachypalpus meigeni :

A very recent discovery : Bomal (FR.78) 14.5.1983.

20) Brachypalpus valgus :

Eunotus and meigeni may only be strays here, valgus is certainly indigenous. Five of the 6 known records are from the south-east of the country and date from pre-1950 days. Then, surprisingly, K. VERBEKE took one quite near the coast : Zedelgem (ES.06) 22.5.1982.

21) Caliprobola speciosa :

This most handsome of our hoverflies appears restricted to ancient woodland . It has not yet been taken in the west and the far north. Records are frequent, but normally concern single individuals : widespread, but not numerous. It appears quite prosperous : 30 records since 1970.
Early May - early July, and two August records. Peak late May - early June.

22) Callicera aenea :

One single record : Herbeumont (FR.61) 2.5.1952.

23) Callicera bertolonii :

Two specimens are known : Herbeumont: 26.5.1956 (R.L. COE, det.) and in a Malaise trap at Liernu (FS.20) late August 1984 (orchard).

24) Callicera rufa :

One single specimen : Belvaux (FR.55) 30.6.1980 (B. BRUGGE, det.)

25) Ceriana conopsoides :

This species of ancient woodland has become much rarer lately : there are only 7 recent records, against 18 before 1950. It may have been overlooked because of its resemblance to Gorytes digger wasps (specimens also turned up among Conopidae of the genus Physocephala in the I.R.S.N.B. collection !). Old records are scattered all over the country ; recent ones are from the south-eastern quarter.
Early May - early August ; there is also a mid-September record.

26) Chamaesyrphus lusitanicus :

Records are very scarce (though they concern several specimens each) and even the most recent one is almost half a century old : Geel (FS.37) 15.8.1941. This heathland hoverfly may still survive, but recent sampling of some of our remaining heaths have not yielded any. The example of Geel is characteristic for what has befallen our once so large heaths. A century ago agriculture was dependent there on the exploitation of Calluna heaths ; nowadays only a few hundred square metres of heathland survive in this large commune.
Known flight period : mid August - early September.

27) Chamaesyrphus scaevoides :

JACOBS (1901) mentions the species from Izel (FR.70), but there was no material to confirm its presence in Belgium till a number of specimens were taken in coloured dishes on sandy outcrops quite nearby : Châtillon (FR.90) 1980.

28) Cheilosia acutilabris :

Only two females of this poorly known species have been taken here : Buzenol (FR.80) 8.8.1980 and Bra (FR.97) 8.7.1981. It is a small and narrow fly that closely resembles C. mutabilis and may have been confused with this ; the hairy eyes of the female acutilabris exclude all doubt, however.

29) Cheilosia albipila :

This very early species is regularly taken all over the country and it may be far more numerous than map 29 suggests : remoter areas are scarcely visited early in the season. It should be looked for on catkins and early spring flowers but it is often seen resting on dry matted grasses, or hovering in forest clearings. It is generally associated with woodland of various types.
Normally albipila is univoltine (mid March - late May ; peak : mid April), but after the hot summer and autumn of 1985 two specimens were taken much later : a female at Nieder Emmels (KA.87) 20.9 and a male at Houffalize (FR.95) even later 15.10.

30) Cheilosia antiqua :

This is a rather uncommon univoltine spring species with a distribution pattern that is shared by many other Cheilosia : it occurs all over the eastern half of the country but not in the northernmost part. A woodland species.
Mid April - early June ; peak : mid May.

31) Cheilosia argentifrons :

A woodland species, reputedly widespread in NL, but here, as in D and DK (BARKEMEYER, 1986) very rare. There are only six records, widely scattered so that no pattern emerges. May.

33) Cheilosia barbata :

A fairly common and widespread eurytopic (?) species south of the Sambre-Meuse valley, but known only from two old records north of it, probably strays. Yet, even in southern B it appears less abundant than further south ; in adjacent Lorraine it is, like in the Alps, the dominant summer Cheilosia.
Early May - late August ; peaks : July and late August.

34) Cheilosia bergenstammi :

A widespread, but rather local species, mainly in wooded areas, but not exclusively so. It is one of the few Cheilosia to be taken repeatedly in the coastal area. There are two broadly separated broods : late April - mid June ; late July - mid September.

35) Cheilosia caerulescens :

Strangely enough this Alpine species has apparently settled in the Meuse Valley near Liège in recent times. Since the first known capture by VAN DOESBURG (12.6.1959) two more specimens have turned up nearby : 9.6.1976 and 20.5.1986. Then B. BRUGGE took a further specimen in the region : 20.9.1986 on the Dutch side of the Montagne St. Pierre (VAN DER GOOT, in litt.)

36) Cheilosia canicularis :

The larvae of our largest Cheilosia are known to live in Petasites, whereas adults feed almost exclusively on yellow Asteraceae. The distribution patterns of these plants do not explain why canicularis occurs only in part of the territory. Petasites is scattered all over the country and yellow composites are found anywhere. Yet, apart from an isolated colony in Antwerpen (ES.97) canicularis does not cross the line FS.54 - ES.94, and it does not occur west of Brussels either. Normally there are two separate broods in this part of Europe : late April - late June and mid July - late October. The number of 2nd-generation records is twice as high and nearly all spring records are from the south of the country. In NL the spring specimens are rarely seen too (VdG81). It is just possible that the species is normally univoltine north of the Meuse and bivoltine south of it. In the Alps, where canicularis is common the flight period appears uninterrupted.

37) Cheilosia chlorus :

In NL only one record of chlorus is known (South Limburg). Yet in this country it penetrates at least 50 km more to the north, though it is not found in the west. It may be quite abundant, too, near humid forest and in wet hay meadows, often on Caltha, occasionally on other spring flowers.
Early April - mid June. In favourable weather there is a peak late April ; when spring is cool and wet this may be reached much later.

38) Cheilosia carbonaria :

There are scattered records from most of the country, even from the far west. It is found in the same type of habitat as chlorus and it is probably more frequent than available records suggest. Especially females may be seen in number e.g. in the Leuven-Brussel area.
It is clearly bivoltine, but the flight period (early May - early September) is not interrupted as in NL (VdG81).

39) Cheilosia chrysocoma :

Apart from one pre-1950 record from ES.55 all chrysocoma were taken in the east of the country. Recent records are rather scarce and concern single individuals. Before 1950 the species may have been more prosperous. As it is one of the most conspicuous of the genus it is not as easily overlooked as other Cheilosia, so the scarcity in recent years cannot be explained that way. It might be confused with Osmia or some Andrena though.
Early April - mid May, and a few scattered records mid June and early July.

40) Cheilosia cynocephala :

One of the most difficult Cheilosia to identify; it may often have been overlooked or confused with "vernalis". The "characteristic" darkening of the wing top is not always apparent, and may be very faint indeed in newly eclosed specimens. Records are few in number and mostly from the centre of the country, though in NL it is known mainly from the lowlying polder area. Anyway, T. ZEEGERS (in litt.) mentions captures in wooded areas, too.
Mid May - early September, based on little evidence.

41) Cheilosia fasciata :

Like C. maculata this is a species linked with Allium ursinum, a plant that is not at all rare in central and southern B. Yet fasciata, though mentioned by JACOBS as far back as 1901, is known from 4 localities. In contrast to maculata, whose flight period starts with the flowering of Allium, fasciata is on the wing much earlier. The adult does not exclusively feed on the food plant of the larvae as is the case with maculata. It is easily overlooked even if deliberately hunted for. It rather looks like a nondescript Muscid.
Late March - mid May.

42) Cheilosia flavipes :

This fairly large brownish univoltine spring species occurs only in the eastern and southern parts of the country, apparently more frequently in the (warmer) southernmost part of the region.
Late April - early June (peak : mid May).

43) Cheilosia fraterna :

A species from wetlands and humid woods known from most of the territory, not however from the Mosan District yet. It is still locally numerous, but the number of pre-1950 records exceeds the total of later captures, so that fraterna may have suffered from drainage and regularisation of stream valleys.
Mid April - mid June, with a peak in May.

44) Cheilosia frontalis :

A mountain species, recorded only in the High Ardennes : Stavelot (GR.08)3.IX.1950 and Recht (KA.88) 7.V.1972 and 11.V.1975.

45) Cheilosia grossa :

This is a very early species, to be seen on Salix catkins or fruit tree and Prunus blossom, as well as hovering in the sunshine. It sometimes occurs together with albipila, but it is in all probability scarcer. Most records are from the north of the country, but this is, after all, where the entomologists live.
Early March - late April, chiefly late March - mid April.

46) Cheilosia honesta :

A rather rare species, taken mainly in the south-eastern quarter of the country (continental species). As recent Malaise trap captures show, it may be fairly numerous in places.
Late April - late June ; peak : late May.

47) Cheilosia illustrata :

This most untypical but easily identifiable of our Cheilosia is also one of the commonest of the genus, though it is absent from the west and the north. The two records from the lower Schelde valley date from the exceptional dry and hot spring of 1976 and may have been strays. Mid May - mid September, with fairly steady numbers throughout July and August.

48) Cheilosia impressa :

Records are fairly numerous and widespread, except in West Vlaanderen. Judging by field experience however, it must be commoner than is shown in map 48. In late summer it can be seen in fair numbers (pratically always on Apiaceae) on grassland and wood verges.
Mid May - mid September, with a sharp increase in the last decades of August.
In comparison to NL, there seems to be an extra spring generation here, albeit a very limited one.

49) Cheilosia intonsa :

Belgian records of this species concur with data from NL : widely scattered but not numerous; no apparent habitat link. Early May - mid September; there are too few data to show peak periods.

50) Cheilosia langhofferi :

As far as is known this spring species is rare everywhere and Belgium is no exception. Two records : Villers-sur-Lesse(FR.45) 14.V.1950 and Rocherath (LA.09) 26.V.1981.

51) Cheilosia lenis :

Though the species does not figure on either of the earlier Belgian catalogues it is a fairly frequent woodland species with a distribution pattern similar to that of other continental Cheilosia, i.e. absent from the north and the west.
Early April - early June, mainly active in the first decades of May.

52) Cheilosia longula :

As in NL this small and narrow Cheilosia is most frequent on Calluna flowers in late summer. As there is little heathland left, longula has become quite scarce. Thus there are no recent records at all from the largest heath nature reserve at Kalmthout (FS.09) though it has been thoroughly searched. Single specimens may be met with in dry woods, but on the whole the species is not prospering.
Early July - late September, mainly late August - early September.

53) Cheilosia maculata :

Associated with Allium ursinum like fasciata, but it is on the wing much later and certainly more numerous, less elusive and easier to catch (sluggish flier). It must be more widespread than map 53 suggests.
Early May - early July.

54) Cheilosia mutabilis :

A widespread woodland species, even in the coastal region where Cheilosia are notably scarce. Still, because of the small size it must be often overlooked. As there are a large proportion of U.T.M.-squares where it has not been recorded since 1950 it may have become rarer in places; in other regions it is still frequently taken.
Late May - early September, most numerous in early summer.

55) Cheilosia nasutula :

Another continental species, fairly frequent in the south-east. There are also a few records from the southern part of the Brabant district.
Late April - mid June, mainly between late May and mid June.

56) Cheilosia nigripes :

This may be a more xerophilous species than nasutula, from which it is so difficult to separate. Most records are from basic soils; so it is not surprising to see that it is virtually absent from the Ardennes.
Early May - mid June, peak probably late May, but there are few reliable data.

57) Cheilosia omisa :

Three records only, all females and all from the western part of the Brabant district; Tervuren (FS.03) 3.V.1951; Groenendaal 5FS.02) 1950; Calonne (ES.30) 3.VI.1982.

58) Cheilosia pagana :

This polyvoltine and very widespread species is probably absent only in very dry and infertile sites. The lacunæ in map 58 can be explained by the fact that it is often overlooked, especially the smallest specimens. As Malaise trap records demonstrate it is present in fair numbers in various biotopes, but rarely as abundant as e.g. C. albitarsis.
Late May - early October. Populations tend to be quite constant, apart from a slight slump in early summer and a sharpish rise in August.

59) Cheilosia praecox :

Records of this early woodland species are small in number, but distributed all over the country, except the north-east. It is rather scarce and may be getting rarer still.
Mid April - late May, mainly late April - mid May.

60) Cheilosia proxima :

This is yet another woodland species with a distribution like antiqua, canicularis, lenis, etc. It is not particularly numerous, but a few specimens are taken every year, also in Malaise traps. Records suggest a bivoltine species : it flies from late April till late August, but late June and early July there are only 3 records in all.

61) Cheilosia pubera :

A very rare species known only from valley sites in the south-east (xerophilous?).
Early May - early June. Latest record dating back to 1967.

62) Cheilosia rotundiventris :

Though in theory it appears easy to separate rotundiventris from the much commoner "vernalis", it is not at all easy in practice : transitional forms are not rare, but these have all been relegated to "vernalis". Typical rotundiventris are very scarce, except in 1986, when more specimens were taken than in all the years before. Distribution probably as antiqua, ...
Mid April - early June, as well as two early August records.

63) Cheilosia ruficollis :

This small narrow brownish species is known from 4 sites only, but may have been overlooked. In the field it is indistinguishable from e.g.mutabilis or"vernalis"
Maissin (FR.53) 17.VII.1953, Sart Tilman (FS.80) 8.V.1979 and 1.VI.1979;
Mussy-la-Ville (FQ.99) 29.VIII.1980; Winksele (FS.14) 16.V.1986.

64) Cheilosia rufimana :

A fairly large brownish Cheilosia not unlike lenis when seen in the field and with a similar distribution pattern, but a good deal more uncommon. Most records are quite recent. A univoltine woodland species, known to fly from late April till early July, most records from the first half of May.

65) Cheilosia scutellata :

A frequent summer species of woodland and scrub, rare only in the west. Nearly half the records are pre-1950, but it is still prospering in at least some parts of the country. Early May - mid September, most numerous late July - late August.

66) Cheilosia semifasciata :

A small and inconspicuous univoltine spring species, whose larvae are known to feed on Sedum telephium, an infrequent but widely scattered woodland plant. Distribution pattern like antiqua. Early May - mid June; records are very scarce though.

67) Cheilosia soror :

This xerophilous southern species is known from the extreme south of the country; as well as from some sites in the limestone region; it does not seem to reach the Sambre - Meuse valley, unlike most other xerophilous hoverflies.
A late summer species (late July - mid September), though there is a single June record.

68) Cheilosia trisulcata :

So far only females have been recorded from four sites only. Heiderscheid (GR.13) 27.V.1954; Erpeldange (KA.92) also 27.V.1954; Crupet (FR.37) 6.V.1977; Haasrode (FS.23) 19.IV.1981. Presumably a univoltine spring species of woodland, with a distribution pattern like antiqua, etc., but much more local.

69) Cheilosia variabilis:

A common species in all types of woodland over most of the country, but rare in the north-west and not yet recorded from most of the Kempen District. Its phenology differs considerably from what is known about Dutch variabilis.
NL : late April - late July; B : early April - early September with a pronouced peak late May and a secondary one late July. August records are nearly all from the south of the country, and in the Lorraine district variabilis still flies in number late August. This suggests the development of at least one extra generation.

70) Cheilosia velutina :

This is a poorly known species. There are rather few records though it is quite abundant in places (e.g. ruderal sandy sites, dry road verges, field balks) where it is nearly always seen on Daucus carota, about the least attractive umbel for Syrphidae. This preference suggests it is a xerophilous species; its behaviour contradicts this : it remains very active in cool and even wet weather. There is one record from early May and three from early June (i.e. before Daucus flowers), but these may be misidentifications or freaks. As STUBBS points out separation from proxima may be tricky. The main flight period is mid July - mid September and the species may be particularly numerous during the last decades of August.

71) Cheilosia vernalis :

This highly variable species has long been suspected to be a complex of taxa and this was confirmed by CLAUSSEN (in litt.) who stated that the Belgian specimens that were sent him belonged to two species. His study has not been published yet, so that all records are lumped together still. The complex is widely distributed and particularly numerous in the north.
Early April - mid October; records are plentiful in May and August, very few in number late June - early July. In mild weather "vernalis" remains frequent throughout September.

72) Cheilosia vulpina :

The distribution pattern suggests this is a xerophilous species. There appear to be two widely separated broods (late April - mid June; mid July - late August). Records are rather scarce, however.

73) Chrysogaster chalybeata :

This species has been recorded from most of the country, but not from the north and the north-west. It is rather local, but may be abundant in some humid sites. It does occur in quite dry places too, however.
Mid April - early September; main flight period early June - late August.

74) Chrysogaster hirtella :

A common and often abundant species of wetland and humid grassland all over the country, but more numerous in the north and the extreme east. Records stretch from mid April till September, but are very few in number outside the main flight period May - June. VDG 81 supposes the species to have two broods in NL, but nothing of the sort is apparent in the records for this country.

75) Chrysogaster macquarti :

In the literature there are plenty of references to this species, which seems to occur only in certain types of bog. Whenever the material could be found back, it turned out to be hirtella. The confusion is caused by bad definitions and mistakes in the then current handbooks (SACK, SEGUY). So far one single specim n of macquartihas been found in I.R.S.N.B. : Postel (FS.58) 13.VIII.1922. Special efforts were made to find macquarti in heath pools north-east of Antwerpen, but in vain.

76) Chrysogaster solstitialis :

This woodland species has been recorded from most of the country, even from tiny woods in the maritime district. It may be quite abundant in places, often on Apiaceae in forest clearings and drives. As it does not seem to be much affected by adverse weather it is sometimes the only active hoverfly in sight when the weather is cool and dull.
Early May - late September; from late May till late August numbers vary little. Generations probably succeed each other without larva diapause.

77) Chrysogaster viduata :

This is a generally distributed wetland species (small pools, ditches, wet grassland), except in the extreme north. Where it occurs it is often quite numerous. The short flight period (early May - late July, but chiefly late May - early June) suggest a univoltine species. A few late captures (September - early October) show that sometimes a very reduced second brood develops in autumn.

78) Chrysogaster virescens :

There are three records from the north of B., where it is extremely local, but it occurs mainly on the highest plateaux, especially in the Hautes Fagnes, where it is fairly common.
Data are rather few in number, but are reminiscent of viduata : late April to early July, as well as a single mid-September record.

79) Chrysotoxum arcuatum :

Though in NL arcuatum is widespread on sandy soils, records from the plains and low hills in B are scarce and mostly quite old. In the south-east the species is quite prosperous, as is shown by numerous Malaise trap captures. Strangely enough it is not known from the Grand-Duchy yet.
Mid May - late September; peaks : early June and mid August.

80) Chrysotoxum bicinctum :

Widespread and fairly numerous in most of the country, somewhat scarcer in the west. LECLERCQ et al. (1980) listed it among the species feared to be threatened, but a large number of recent captures, particularly in Malaise traps have dispelled this fear. As it mainly flies very low among the vegetation (like arcuatum) it often escapes notice.
Late May - early September, more numerous from late June onward.

81) Chrysotoxum cautum :

This is by far the most common Chrysotoxum south of the linguistic border, rather less common in the north-east and practically absent from the whole of Flanders.
Early April - early September, but before May and after early July records are quite scarce. Peak : late May -early June.

82) Chrysotoxum elegans :

This species used to occur all over the eastern half of B., particularly in the Mosan district. The only records after 1950 have been taken from the literature, and even they are now 30 years old. Probably all but extinct now.
Mid May - mid September with a few lacunae in late spring.

83) Chrysotoxum festivum :

As virtually all Chrysotoxum, festivum is limited to the east of the country. Recent records (39) are fewer in number than older ones (52), and as map 83 clearly shows recent records are almost completely lacking in the Mosan District. In other regions it is still regularly taken, also in traps.
Early May - early September; records are not sufficiently numerous to designate reliable peaks.

84) Chrysotoxum intermedium :

Six of the seven records date back to 1901, the remaining one (which was not seen by the authors) to the hot summer of 1976 : Sombreffe (FR.19) 15.V (Fichier de Gembloux). Does this southern species swarm north in exceptional circumstances ? The 1901 specimens were captured in June (1) and July.

85) Chrysotoxum latilimbatum :

In I.N.S.N.B. a single female was found, which had been taken at Hockai (GR.19), probably before 1900.

86) Chrysotoxum octomaculatum :

A xerophilous or psammophilous species, known chiefly from heaths, has rarely been taken here, and since 1950 only in the Kempen and on the sandy heaths and dunes near Châtillon (FR.90). There are few records, one of late May, the others between late July and early September.

87) Chrysotoxum vernale :

As map 87 clearly shows this is another Chrysotoxum limited to the eastern half of the country. In addition it appears to be lacking in the centre as well, so that its range in B may be discontinuous.
Early May - mid July, without apparent peaks.

88) Chrysotoxum verralli :

Apart from a single old record from the centre, this xerophilous (?) species is known only from the south-east, but even here records are scarce. They date from July and August.

89) Criorhina asilica :

As a near-perfect honeybee mimic this large woodland hoverfly has no doubt fooled some collectors. Yet it is not all that rare in most of the country. A univoltine spring species flying from early May till mid June.

90) Criorhina berberina :

Both the type and the form oxyacanthae are widespread and often fairly common all over the country, including the Maritime District. As Malaise trap records show it may occur in gardens and orchards as well as in woods. As a matter of fact it is quite often taken in Malaise traps.
The flight period appears very long (early April - late August), but 80% of the captures are dated May and June, though there is a minor peak in the middle of July.

91) Criorhina floccosa :

There are scattered records (all single specimens) within a rather narrow belt stretching from west to east through the centre of the country, but its range may be wider. After all it is a more convincing bumblebee mimic than berberina.
Early April - mid June (peak period probably mid May).

92) Criorhina pachymera :

This is another honeybee mimic, and even more perfect than asilica. As it also has an untypical behaviour (it should be looked for on three trunks)it must often escape attention. So far it is only known from 6 places in the Brabant district, more it may be much more widespread.
Late April - mid May.

93) Criorhina ranunculi :

A large dark bumblebee mimic which is difficult to recognise and (as the males imitate the boisterous flight of their "model"),very difficult to catch. It may be rather numerous, but as all very early species its range is imperfectly known.
Mid March - early May, plus a single record early June.
All five Criorhina specias may occur in the same wood; this was found to be the case in a rather small and not too remarkable wood at Winksele (FS.14).

94) Dasysyrphus albostriatus :

This fairly common and quite widespread woodland species is rarely seen in numbers. The species flies apparently from mid April until mid September (NL: mid October), but there are two obvious peak periods : mid May - early June and again mid August - early September.

95) Dasysyrphus friuliensis :

This species is considered in GB to be a recent immigrant (ENTWISTLE, 1982) and this might be the case here too. The oldest Belgian specimen was taken in 1949 at Hockai (GR.19), which had been then a favourite collecting site for half a century and more. Of course, this can never be more than a presumption, as friuliensis is not only scarce; it had been confused with the common D. venustus till VAN DER GOOT described it as a good species in 1960. D. friuliensis is now known from a limited number of localities in the south-east mainly, all well-explored sites. Surprisingly it has also been taken at Gembloux (FS.10), which would seem out of its range and lacking suitable habitats. The only part of the country where friuliensis is repeatedly taken is the Hautes Fagnes region with its large Picea plantations.
Early May - late July, most frequent late May - early June.

96) Dasysyrphus hilaris :

Opinions as to the status of hilaris are still divided: intermediate forms between hilaris and venustus are not uncommon. It has been treated as a good species with a view to future reference. Anyway, in the matter of faunistics there appear to be few differences between the two pieces, except that venustus is much more frequent : both range and flight period largely coincide.
Mid April - late July (peak : late May - mid June).

97) Dasysyrphus lunulatus :

This species is generally associated with conifer woods. Given the enormous extension of conifer plantations this century, it is surprising that there are not more records of lunulatus. Its range is more limited than that of the other commoner Dasysyrphus : apart from a single (Malaise trap) capture at De Panne (DS.76) no records are known from the western half of B. In the Kempen, too, few specimens have been taken, though large areas are planted with pine trees. Lunulatus seems to be fairly frequent in the south-east only.
Early - April - early August, most records between mid May and late June.

98) Dasysyrphus nigricornis :

The only known Belgian specimens are in Dutch hands : J.A.W. LUCAS took them at Recht (KA.88) 17.V.1972.

99) Dasysyrphus tricinctus :

A widespread and fairly frequent species known from all over the country. It has been recorded in number from heaths, but it occurs in various other habitats as well : woodland, fens, carr and even agricultural land. This appears to confirm the suspicion put forward by AUBERT et al. that it is a migrating species. At least part of our population should be indigenous.
Late April - early October, but very few records in June and early July. Peaks : early and mid May; mid and late August.

100) Dasysyrphus venustus :

The commonest species of the genus is most years quite numerous in various types of woodland all over the country. Its flight period seems rather long for a reputedly univoltine species : early April - mid August. However, there are very few records until late April and from early July on. Main flight period mid May - early June; records suggest possibility of a reduced (and occasional ?) second generation late July.

101) Didea alneti :

This large and handsome fly may well be among the endangered species, at least in some parts of the country. There are only 9 recent records against 17 before 1950 and most of these are from the Hautes Fagnes.
Mid May - mid October without apparent peaks.

102) Didea fasciata :

This species, which is fairly frequent, is surprisingly poorly represented in older collections, though it is - at least in part - a migrant and may be taken anywhere. A Malaise trap in a garden at Ottignies (FS.01) yielded some female fasciata for four consecutive years, so that it may be supposed to reproduce there.
Early May - mid October, more numerous in August (migrants ?).

103) Didea intermedia :

A xerophilous (?) species associated with conifer plantations and heaths. The distribution pattern as shown by map 103 is rather peculiar : it suggests a number of widely separated settlements. There are a fair number of recent captures.
Early May - mid August (NL : late September).

104) Doros conopseus :

All but three specimens known of this coveted "collector's piece" date back to pre-1950 days. The only recent record : Aywaille (FR.89) 3.VI.1979. This woodland species has probably always been scarce, but when in twenty years of more intensive collecting only a single specimen turns up, it must be endangered. It was apparently never taken in the High Ardennes.
Late May - late June, plus a single record 10.VIII.

105) Epistrophe diaphana :

This is a very local species limited to the south and east. In some localities (Lesse valley) it is taken repeatedly.
Late June - early August.

106) Epistrophe eligans :

The most numerous Epistrophe has been recorded from various types of woodland all over the country. It is not so often seen on flowers, though. Most of the captured specimens are males : apparently they have been taken when hovering in forest clearings and drives. In contrast to males of other Syrphidae they are often seen hovering together in small swarms.
Mid April - early September ; less than 3 % were recorded after June. An absolute peak is normally reached mid May.

107) Epistrophe euchroma :

This atypical Epistrophe has been taken in only 23 localities, all in the eastern half of B. As it is fairly small, narrow and dark, it may have been overlooked by many. Specimens have been taken in three Malaise traps.
Mid April - early June without apparent peaks ; eclosure may vary according to the weather circumstances.

108) Epistrophe grossulariae :

A rather puzzling species ! It is known from all over the country (as is normal for a migrating species), but it is taken in number only in the extreme south and east, where dozens may crowd on umbels. Possibly it is a resident species there and an immigrant in the rest of B. In FS.14, for instance, small groups of grossulariae were seen gradually moving north while foraging on 5 consecutive days in August 1985. Not a single other specimen was seen during hundreds of excursions 1981 - 1986. The species may, of course, easily be confused with large specimens of Syrphus s.s.
Early May - mid September, most numerous between mid July and late August.

109) Epistrophe melanostoma :

There are only 11 records, none of them going further back than 1969. They were all taken in the southern half of the country.
Mid May - mid June.

110) Epistrophe melanostomoides :

This is a larger and more conspicuous fly and 31 records are now known (3 from Malaise traps), roughly in the same region as melanostoma, with the sole exception of the only specimen taken before 1950 : Destelbergen (ES.55) 27.5.1942. The other captures were made after 1969.
Early May - mid July ; peak period probably early June.

111) Epistrophe nitidicollis :

A frequent and generally distributed woodland species, rare only in the north-west (which may be due to the lack of suitable habitats)
Mid April - mid August (chiefly mid May - late June). This is a very long flight period for a univoltine species. Presumably this is one of the hoverflies whose eclosure may be considerably retarded by unfavourable weather in early spring. Thus it was found to be numerous mid April 1981 after a spell of exceptionally warm weather. In 1984 and 1985, when the weather was desastrous no captures were recorded till mid June.

112) Epistrophe ochrostoma :

Although it was mentioned in older literature not a single specimen has been found older than 1960. There are only 11 records, all from the eastern half of the country though not its northern part.
Late May - late June.

113) Episyrphus auricollis :

There are not so many records, though this extremely variable species is eurytopic, generally distributed and polyvoltine. Moreover it is thought to be a migrant. No doubt it is often overlooked : the smaller specimens look rather like Platycheirus and they usually move among the lower strata of the vegetation. It is so frequently taken in Malaise traps in a variety of habitats that we may confidently presume it to be one of the commoner hoverflies.
An unusually long flight period : mid March - early November ; most numerous between June and August.

114) Episyrphus balteatus :

No other hoverfly species can ever be seen in such huge numbers as this ... in the high and late summer. Yet it is not conspicuously present for most of the season. There is no doubt the rocketing numbers late July and August are due to immigrants from the south.
No hibernating females seem to have been found here yet, but it is generally assumed that the dark females, which are sporadically taken February - early May have been overwintering here. Records temporarily slump a bit mid April, but afterwards there is a steady though unspectacular rise in numbers until late July. These may be indigenous specimens.
The myriads that regularly invade north-western Europe come a long way. In spring the situation is the same as here even in N. Italy : only dark females are about. ; late May small swarms may be seen in passes heading north.

115) Episyrphus cinctellus :

In August this woodland species may be almost as numerous as balteatus in the extreme south of the country, to a lesser degree (?) also in the east. In the northern half of the country cinctellus is quite scarce and, as is shown by map 115, it has not at all been recorded in the north-east and most of the western part of the country.
Mid April - early October, with a peak mid August - early September.

116) Eriozona syrphoides :

Nearly all records of this bumblebee mimic are from the southern half of B, but records are not evenly spread. The species appears to be present mostly in the far south and extreme east. The scarcity of recent records must mean that the species is not prospering.
Late May - early September.

117) Eristalis abusivus :

This species, which remained unrecognized in this country till 1979, is in fact widespread and locally fairly frequent, at least in some years. It is most common in the north-west, but not at all rare in many other parts of the country. This has been demonstrated by repeated Malaise trap records and by the many specimens taken by Gembloux students. Yet, it is either absent or extremely rare in many localities.
It seems possible that abusivus is either increasing in number or extending its range. We know of only 4 records before 1950 (i.e. 2 % of the total) and all of these are from the extreme north, near the Dutch border.
Early April - late September : the fluctuating numbers suggest a polyvoltine species with obligatory diapause.

118) Eristalis aeneus :

As in NL and GB this is essentially a coastal species; it is fairly frequent in the Maritime District, also north of Antwerpen. Similarly it is occasionally taken inland, too, but these cannot be shrugged of as "strays blown inland" as STUBBS (1983) does. This may be the case in GB., but the repeated records over a long period in some localities (Mons, Virton) suggest these must be local populations. The inland records are scattered over much of the country, but clearly concentrated in the south-west of the Brabant District. K. DECLEER found they had settled there on disused slagheaps of the coalmining industry. Besides only a few hundred km further south the species is fairly common inland. It may therefore be presumed that Belgium is a transitional zone between northern countries, where aeneus is a purely coastal species, and central Europe, where it is generally distributed.
Mid March - late September.

119) Eristalis alpinus :

A continental species, which has obviously always been very local (in bogs ?) but may now be all but extinct. Except for a specimen mentioned in the literature (Hautes Fagnes 1965) there are no recent records at all.
Early June - late September. Records are, however, few in number and there are many gaps.

120) Eristalis arbustorum :

A ubiquitous and often very numerous species all over B. Mid March - late October; numbers fluctuate somewhat, but there are, except perhaps in the second half of August, no conspicuous peaks.

121) Eristalis cryptarum :

There are five records of this handsome species, the latest dating back to 1912, so that there is little hope of its surviving. In the Alps and the Massif Central it is locally still prosperous in boggy places. The only region where such sites still subsist here is the Hautes Fagnes. It has been thoroughly sampled these last ten years, but no cryptarum has turned up. Because of its striking colouration it stands out among other Eristalis, so that there is little chance of its having been overlooked.
Mid May - mid June.

122) Eristalis horticola :

This species, mainly occuring in woodland, is widespread though not exactly numerous, in most of the country. In the north-west, however, it appears to be very scarce, whereas in the southern half it is more frequent.
Mid April - late September, with fairly constant numbers mid May - early September.

123) Eristalis intricarius :

Except in the Grand-Duchy intricarius appears to be widespread, but far more numerous (especially in wetland) in the north and north-west, almost the reverse from horticola. Early March - mid October, mainly mid April - late August.

124) Eristalis jugorum :

The distribution pattern of jugorum leaves no doubt that this is a mountain species, widespread (but rarely in number) in the central part of the Ardennes. On adjacent lower hills it is much rarer.
Late May - mid October, mainly in early summer.

125) Eristalis nemorum :

Common, eurytopic and often quite numerous everywhere, except in the north-west, where it is taken only sporadically. The variety sylvarum MEIGEN, rare in NL, is quite frequent in central and southern Belgium. It is normally larger and the brownish antennae as well as the yellow base of the hind femora have often led to confusion with other Eristalis.
Mid April - early October, apparently more numerous July - August than May - June.

126) Eristalis pertinax :

A very common ubiquitous species, probably most numerous of our Eristalis. Late February - early November : peaks mid May and mid August, but present in number throughout the season : already in April figures are quite high and pertinax may be the dominant species.

127) Eristalis piceus :

Until the revision of Eristalis undertaken by HIPPA is finished, nothing definite can be said about the rupium/ vitripennis / ? piceus complex in this country. Anyway, in lowland Belgium, as in the Dutch and North German plain rupium seems to be replaced by a related species, provisionally identified by CLAUSSEN as piceus. Most material has been taken quite recently, mainly in Malaise traps, indicating that in wetlands the species may be abundant. The complicating factor, however, is that ? piceus has been taken also in the southern hill country, usually at lower altitudes than the typical rupium specimens. Unfortunately males, which have distinct surstyli, are not often captured; the females are often difficult to separate.

128) Eristalis pratorum :

As has been emphasised before, few hoverfly species appear in comparable numbers year after year : even very common species like Sphaerophoria scripta may be rather rare in some some seasons. E. pratorum, however, is an extreme case in these regions : it may be (virtually) absent for many consecutive years and then suddenly reappear in number anywhere. 1985 was such an exceptional year and fortunately there were many observers to record the phenonemon. In a single season more occurences were noted than in the hundred years before. It also seems certain that pratorum is a eutytopic species occuring all over the country.
Mid March - late August. Half the Belgian records date from mid June to early July, though in the Netherlands (T. ZEEGERS, in litt.) and central Germany (MALEC, 1986) pratorum was quite numerous already in April.

129) Eristalis rupium :

As is shown by map 129 "typical" rupium is practically limited to the southern half of the country : it is indeed a mountain species. See also E. piceus.
Early May - mid September.

130) Eristalis sepulchralis :

There are remarkable similarities with E. intricarius : both species are generally distributed over the country and clearly eurytopic, but obviously more frequent in humid surroundings and more widespread in the north and north-west.
Late April -late September, most numerous mid July - late August.

131) Eristalis tenax :

Adult females hibernate and may appear quite early in the year on catkins and garden flowers (Crocus)as well as in hothouses. These early records are not at all numerous, certainly not comparable with the huge numbers of specimens that can be seen in autumn; the number of hibernating specimens is probably rather small. Most may return to the south in the fall.
The species remain scarce until numbers start picking up around mid May. Except for a temporary low late June- early July numbers gradually increase to reach an absolute peak in the second half of August. However, even in late autumn tenax is still a familiar sight, and, weather permitting, fair numbers can be seen as late as mid November.

The biology of tenax resembles Episyrphus balteatus, but is not quite identical. Though it is generally accepted that the build-up of populations during summer is due at least in part to immigration from the south, there is not such a sudden invasion as in the case of balteatus. There may be a more limited (but continuous) inflow of immigrants. They also may have had to travel less far. Whereas balteatus is as scarce in central Europe as it is here in early spring, tenax is already abundantly present (both sexes)) e.g. in the Dordogne region, the Swiss Jura and the southern slopes of the Alps.

132) Eumerus flavitarsis :

This is a rare and local species, apparently restricted to the south-east. The few records available are from June and July.

133) Eumerus ornatus :

It is hardly more numerous than the former species, but its range may be somewhat larger. May - July, as well as a single record late September.

134) Eumerus sabulonum :

This small, but unmistakable psammophilous species has probably always been rare, but is now extremely local. Recent records are limited to inland sand dunes in central Limburg and the coastal dunes. Late June - mid August.

135) Eumerus sogdianus :

Of our three species of the lesser Narcissus fly (the Eumerus strigatus group) this is no doubt the rarest, but like the other two it may be quite abundant where it does occur. Nearly all recent captures have been made in the Maritime District.
The species of the strigatus group have largely been overlooked by collectors so far and they are surely more widespread than the maps suggest. As all three may occur in the same site, though in unequal numbers, many males should be collected.
Records are few in numbers, but suggest two separate broods : mid May - late June, and again late July - mid August.

136) Eumerus strigatus :

There is little doubt that this is the most frequent species of the group in the country seen as a whole. It is certainly commoner than one would think by looking at map 136, and this has been proved by the I.R.S.N.B. Malaise traps experiments. It is probably less frequent in the south-east, but in agricultural regions it is often abundant, especially in warm and dry summers.
Early May - late September, most numerous in June and August. The figures in table 3 probably give quite a distorted picture of its phenology. The overwhelming majority of data were obtained by means of Malaise traps and unfortunately large numbers of strigatus happened to be taken in a couple of experiments that either started too late in the season or had to be broken off prematurely.

137) Eumerus tarsalis :

Two records only are known : Embourg (FS.80) 30.VI.1896 and Groenendaal (FS.02) 30.VII.1902. They were possibly strays. Around the turn of the century a remarkable number of southern or/and xerophilous species were collected (not only Syrphidae but also Asilidae and Stratiomydae) which have not been taken since.

138) Eumerus tricolor :

This is a xerophilous species with a limited distribution, probably occuring mainly on chalk grassland. There are not many recent records, but the species has certainly survived in one or two localities (Beauraing !) where it has been taken repeatedly.
Early May - early July.

139) Eumerus tuberculatus :

Strangely enough this species was not recognised until quite recently (M. LECLERCQ, 1976). Yet it is not at all uncommon in various habitats. Locally it may be fairly numerous, e.g. in the neighbourhood of plant nurseries, but also in gardens, even tiny ones.
Mid May - early September : rare in July, so it is probably bivoltine like the other two of the strigatus group.

140) Ferdinandea cuprea :

This woodland species is widespread and generally distributed. It may be seen on flowers (e.g. Ranunculus), but should be looked for at the foot of tree trunks, where in spring it is often seen together with Brachyopa.
Records are not too numerous, but it so frequently lands in Malaise traps placed in (semi-) natural surroundings, that it may safely be assumed to be fairly common.

The flight period is not only somewhat longer than in NL (mid April - early October, as against late April - late September), but the two peak periods mentioned by VAN DER GOOT 1981 (i.e. May and August) are not all that apparent here. Records are numerous mid May - early July and much lower later in the year.

141) Ferdinandea ruficornis :

There are but a very limited number of records, scattered all over the country. Two specimens were taken early May, two in August, one was not dated.

142) Helophilus hybridus :

Fairly numerous in the Maritime District, local in other parts of the country where most records concern single individuals. According to STUBBS (1983) its larvae feed on decaying Typha rhizomes. Indeed there is a certain similarity in distribution pattern with Anasimyia transfuga, a related species equally associated with Typha. STUBBS also stresses its low mobility; yet hybridus has been taken in habitats rather far from the marshy grasslands near ponds and ditches (where it is indeed most frequent). It is also remarkable that there are absolutely no old records here - just like in NL (A. BARENDREGT, in litt.)- so that it is thinkable that hybridus has in recent time extended its range. It is hard to believe that assiduous field workers like J. VERBEKE, M. GOETGHEBUER and M. BECQUAERT, who were active over a long period and mainly in the very region where hybridus is commonest, would have missed this species altogether. Yet, not a single specimen has been found in their collections.
Early May - late September, as in NL.

143) Helophilus pendulus :

A eurytopic species, often seen in large numbers in wetlands and humid forest, but also on the flowers of Calluna in bone-dry heaths in late summer. H. pendulus is apparently most numerous in the northern one-third of the country; in the rest of the country it is equally widespread, but numbers appear to be considerably lower.
Late March - late October, as well as two records mid November and one mid December ! There is a minor peak mid June, but the greatest numbers were recorded mid July - early September.

144) Helophilus trivittatus :

A fairly common species everywhere, though by no means every year. It is known to be a migrant species in the Alps, and the increased numbers in late summer may be in part due to immigration.
Mid April - early October; peak from mid August to early September.

145) Heringia heringi :

This is a species of (dry ?) woodland, but is also seen in ruderal sites and dry grassland, rarely on flowers. There are records from all over the country, but they are few in number and concern single individuals only. As all small black hoverflies it may have been overlooked to some extent, but can nevertheless be assumed to be rather rare.
Early May - late June (peak : mid May), as well as two August records.

146) Heringia senilis :

It is not clear how this Mediterranean species, known from three sites in B and one in NL, came to settle here. Two of the Belgian records are from (industrial) Liège suburbs, and a considerable number of specimens were collected May - June 1980 on a sandy man-made site in the port of Antwerpen. In this artificial dune-like habitat senilis was mainly seen sitting on Salix leaves. Before it could be found out whether there was a summer generation as well, the site was completely levelled and denuded.
Early May - mid June.

147) Ischyrosyrphus glaucius :

This is a woodland species, known from all over the country, but frequent only in the centre and the south. It is usually taken on Apiaceae and most records concern females.
There are a few early records (late April - late June), but the actual flight period seems to be from July till mid September with a peak late July - mid August.

148) Ischyrosyrphus laternarius :

This handsome fly is often taken together with glaucius, but their ranges do not quite overlap : laternarius penetrates somewhat further north. It is probably scarcer, too, though it may be seen in number some years.
Mid June - mid September, most frequent in July.

149) Lejogaster metallina :

This is a species of humid environment (and therefore more numerous in the northern plain) but also occurs among the lower strata of the vegetation in various habitats (meadows, orchards, gardens, woods). It is often taken in Malaise traps, even in drier places.
Mid April - mid September. Peak : late May and late July, with a conspicuous low early July.

150) Lejogaster splendida :

This is a wetland species (fens, ponds) with a limited distribution in B. Apart from a single record in the south (a large pond near Les Epioux (FR61)) it appears restricted to the north only, where it may be locally fairly numerous.
Mid May - late August.

151) Lejops vittata :

This is a species of Phragmites facies near brackish water. There are very few records, mainly from the Maritime District. Even the latest (near De Panne, DS.76) dates back 30 years, so that this beautiful species must be feared to be all but extinct.
May - August.

152) Leucozona lucorum :

It is a handsome species of woodland (particularly humid forest on fertile soils) and is generally distributed except in the north-west.
May - August, normally univoltine (early May - early July) with an occasional and very small second generation in late summer.

153) Mallota cimbiciformis :

No material of this elusive species could be found back, but it was recorded in the lit erature last century. As it is known to occur in all neighbouring countries it has been retained on the Belgian list. There is little doubt about its rarety, but the lack of records may be explained by its behaviour : it is reputed to fly high on flowering trees and bushes.

154) Mallota fuciformis :

There are but six records and even the latest dates back to 1950. It is a very early univoltine species (April - early May) and a near-perfect bumblebee mimic and may therefore easily be missed.

155) Megasyrphus annulipes :

This fairly large woodland species is obviously limited to the easter half of the country, but even here it is unevenly spread. It is fairly frequent in the Hautes Fagnes, more local in the rest of the south-east and rare in the north-east.
Mid April - mid September : peaks : early June, early July and possibly mid August.

156) Melangyna barbifrons :

There are only three records of this small and dark early species, which should be looked for on Salix catkins. The only known recent capture was made by J.A.W. LUCAS : Recht (KA.88) : 7.V.1972.

157) Melangyna cincta :

A narrow and rather small woodland species, fairly frequent and generally distributed, but rather elusive. It is frequently taken in Malaise traps.
Mid April - mid September; most numerous May - early June and again mid July.

158) Melangyna compositarum :

This continental species has been recorded only from three localities all in the extreme south-east.
Mid July - early August.

159) Melangyna guttata :

Little is known so far about this inconspicuous (though brightly marked) narrow hoverfly. It is presumed to be a woodland species, but it has also been taken in ruderal places (urban waste grounds), suburban gardens and the coastal dunes. So far it has been recorded from the northern half of the country only, but somehow it seems improbable that it would not occur in the Ardennes.
Mid May - mid September.

160) Melangyna labiatarum :

Like M. ompositarum (the two woodland species occur together and are notoriously difficult to separate) it is difficult to distinguish in the field from small specimens of Syrphus s.s. or Parasyrphus. M. labiatarum is apparently limited to the high plateaux in the south-east and seems more numerous than compositarum.
Late May - early September; a possible peak in July.

161) Melangyna lasiophthalma :

This is en early woodland spring species, mainly seen on leaves rather than on flowers. Though there are only two records from the western half of the country it is probably generally distributed.
Mid March - late May; more than half the records mid April.

162) Melangyna quadrimaculata :

Though quadrimaculata is far from common, it is surely more widespread than map 162 suggests. Especially the unmarked females may easily be mistaken for Cheilosia or even for flies of a different family. In places it may be seen in fair numbers on Salix catkins.
Early March - mid April; when the weather is favourable the species may have disappeared already by the end of March.

163) Melangyna triangulifera :

Like all Melangyna the distribution of triangulifera is imperfectly known. It looks rather like a male Melanostoma scalare and is normally seen on leaves. It may be widespread, but records normally concern single individuals. So far there have been no records from the western half of the country and this may well reflect the real situation.
Mid April - mid August. The limited number of data does not permit a definite statement, but in these regions triangulifera may be essentially a univoltine spring species, which occasionally produces a second (limited) generation in summer.

164) Melangyna umbellatarum :

After cincta this is no doubt the most frequent Melangyna, at least in some years. It is mainly a woodland species, but it also visits flowers on road verges, waste land and even marshes. It probably occurs all over the country.
Mid April - mid September; peak : the second half of August.

165) Melanostoma mellinum :

A ubiquitous and very numerous species, mainly found among the vegetation except in cool and dull weather.
Early April - mid November. Numbers are relatively low in the first half of July and reach a very high peak in August.

166) Melanostoma scalare :

Equally widespread as mellinum, but definitely less abundant and with a preference for wooded sites. Its flight period coincides with mellinum, with a low from mid June until early July.

167) Merodon aeneus :

This is a xerophilous mountain species, known only from the neighbourhood of Rochefort (FR.55), where it has repeatedly been taken in June.

168) Merodon avidus :

This large xerophilous southern species is known from very few and widely scattered localities, which appear to have nothing in common.
Mid June - late July.

169) Merodon equestris :

As is quite natural in a species whose larvae mine bulbs it is far commoner in or near gardens and parks than in more natural surroundings. Still it is not limited to man-made habitats. Most varieties (except for the rare transversalis) occur as frequently as the type form.
VAN DER GOOT 1981 states that its flight period in NL is from early May till mid July, but Belgian records cover a much longer period : late April - mid August, plus a single mid September capture. Early and mid June supply 60 % of the total number. The late records are nearly all from the south of the region.

170) Merodon ruficornis :

Three Belgian records : Losheimergraben (LA.18) 28.VII.1949; Virelles (ER.94) 19.V.1965; As (FS.85) 18.V.1986. These localities suggest it is a wetland species and not xerophilous as our other Merodon.

171) Merodon rufus :

This is another Merodon with a very limited distribution here. It is known from two localities in the limestone belt : Sy (FR.78) with 4 records in the nineteen-thirties and Han-sur-Lesse (FR.55) with 7 records between 1926 and 1985.

172) Metasyrphus corollae :

A common eurytopic species, which during its summer peak can be seen on a large variety of flowers even on agricultural land. As to its phenology this is another instance where Belgian and Dutch data diverge. Here records stretch from late March till late October (NL : mid May - late September); moreover spring and early summer captures are not at all scarce : there is in fact a minor peak early June. On the other hand in both countries numbers rise steeply late July to reach an absolute peak mid August. But then they decrease more gradually than in NL and in September there are still fair numbers of them about.
It is possible only part of our corollae populations are indigenous and the late summer peak might be attributed to immigration. Corollae is indeed known to migrate in fair numbers. However, the same sudden rise in numbers occurs in the Alps around the same period, the last decade of July, as in B and NL; it is unthinkable that such distance could be covered within a couple of days.

173) Metasyrphus lapponicus :

Though it has been taken all over the country (except in the north-east) lapponicus occurs mainly in the south. In the field it is not easily distinguished from other Metasyrphus, so it may be more widespread than is known so far. It was taken in three Malaise traps.
Early April - late August. Early June is a possible peak period.

174) Metasyrphus latifasciatus :

This is a eurytopic species and probably very widespread as frequent Malaise trap records suggest. Highly fluctuating numbers may be responsible for the many blanks on the map. Especially in traps far more females are taken.
Mid April - early October; a first peak occurs mid June, a more pronounced one in the latter half of August. Another similarity with corollae is the fact that this August peak may be deferred to September in exceptionally hot weather.
Polyvoltine with facultative diapause ?

175) Metasyrphus latilunulatus :

This species was not adequately defined and separated from other Metasyrphus until the revision of the genus by DUSEK + LASKA (1976). Older material should therefore be re-examined. Until quite recently there was no proof of its occurence in Belgium, but frequent Malaise trap records show now it is widely distributed though probably not numerous. OWEN (1981), too, recorded a fair number of Malaise trap captures. This suggests that the species may live among the lower strata of the vegetation and thus normally remains undetected.
Records are still scarce and full of gaps, but latilunulatus seems to have a long flight period : late April - early September. So far no captures are known early June - mid July.

176) Metasyrphus luniger :

This is usually described in handbooks as a common and generally distributed species. This needs some qualification. Even in Malaise traps records rarely concern more than one of two specimens and some years it is not recorded at all.
(Most of) our luniger may be migrating specimens.
Mid April - late October, with relative peaks mid May and the latter half of August.

177) Metasyrphus nielseni :

The first known Belgian specimen was taken by N. MAGIS in the course of his systematic survey of the Hautes Fagnes : Rocherath (LA.09) 6.7.1983. Since then three Dutch dipterists (LUCAS, VAN VEEN, ZEEGERS) took more specimens in the same region, early July and mid August. It is not restricted to the high plateaux, however. K. DECLEER took nielseni in a small Sphagnum bog at Beernem (ES.26) near sea-level at the other end of B.

178) Metasyrphus nitens :

This highly variable species is known with certainty only from the south. Other records may concern latilunulatus (which may have a black-haired scutellum, too) or unusual specimens of luniger (which exceptionally has bands instead of lunules on the tergites).
Records range from early June till late September, but they are very few in number and present some gaps.

179) Microdon devius :

Apart from an old record (ES.55) devius - like our other Microdon - is known only from the eastern half of the country. M. devius may be locally abundant, but appears to be getting rarer : there are more records before 1950 than after.
Early May - early August, nearly all records late May - late June.

180) Microdon eggeri :

This is apparently the most prosperous Microdon, though it is restricted to the easternmost part of Belgium, evidently a continental species.
Mid May - late July, with a pronounced peak early June.

181) Microdon mutabilis :

With only 5 records since 1950 as against 11 before, this is probably the most endangered species of the genus. It has apparently not been seen since 1963.
Mid May - early July.

182) Myathropa florea :

A ubiquitus and eurytopic species, most frequent near woodland and hedgerows, but also in gardens and orchards. It is normally quite numerous, but records suggest that in some years one or more broods fail to develop.
Mid April - late October, as well as a few much earlier captures. Peak periods: June and the second half of August.

183) Myolepta luteola :

Three records from the centre of the country : Ghlin (ER.69) 1.7.1905; Groenendaal (FS.02) 15.6.1878; Gastuche (FS.12) 13.8.1984 (N. DE BUCK, leg. + det.).

184) Myolepta vara :

Like former species only known from three records, all from the centre : Dalhem (FS.92) 2.6.1917; Overmere (ES.65) 26.6.1944; Tervuren (FS.03) 8.6.1950.

185) Neoascia aenea :

A wetland species, scattered all over the country, locally fairly numerous and normally together with other Neoascia species.
Late April - late July, with a peak late May - early June. There are also 2 much earlier captures and 2 from mid August. Moreover, during a Malaise trap survey in the extreme south 6 specimens were trapped between 8 and 21 September 1980, so that it may be assumed that the species develops an extra generation there.
SEGUY (1964) quotes a flight period in France of April - October.

186) Neoascia dispar :

This, too, is a wetland species, normally accompanied by other Neoascia, locally extremely numerous. It is known from all over the country, but appears most abundant along northern and eastern borders.
Mid April - early September, most numerous late May - mid July.

187) Neoascia floralis :

Often mistakenly mentioned in literature, the species is known with certainty from locality only : Malmédy (KA.89) 6.6.1960 and 16.5.1980 (J.A.W. LUCAS, det.).

188) Neoascia geniculata :

There are very few records from this wetland species, most rather old and mainly from the north-west of the country. As K. DECLEER demonstrated systematic sweeping may yield a fair number of specimens among much greater numbers of dispar. (see 6.2)
Late April - early September (NL : mid May - mid August).

189) Neoascia interrupta :

This is an even rares species of marshes and humid woodland, but nearly all records are recent and concern numerous specimens. In any case it should be borne in mind that this and the other scarcer species are virtually indistinguishable from the commoner species of the genus in the field; the few records are the fruits of either a systematic sampling or pure coincidence.
Early June - early October, with many gaps.

190) Neoascia obliqua :

As far as is known this species lives in humid woodland. It is regularly taken in the Warche valley (KA.89) and there are also some scattered records from the centre and the south-east.
Early May - late July (NL : until mid September), based on too few data.

191) Neoascia podagrica :

This is the only euytopic Neoascia, generally distributed and often seen in large numbers. Yet, in Malaise traps this frequency is not often reflected : either podagrica is able to avoid the net (like Eristalis and Myathropa) or, what is more probable, they are less mobile than most other hoverflies.
Late March - mid October.

192) Neoascia unifasciata :

We can only quote the only known record from CLAUSSEN + BARKEMEYER (1986) : Bévercé 4.6.1952. The existing material should be re-examined at the hand of this new publication.

193) Neocnemodon brevidens :

All Neocnemodon species - with the partial exception of vitripennis - are usually thought to be rare. Indeed, collections hardly contain any material. Frequent use of Malaise traps has, however, disproved this : in nearly half the experiments carried out so far Neocnemodon was taken (mostly females, which cannot be identified). They can also be taken by conventional means : when deliberately looked for some specimens can usually be found on leaves along woodland verges in the afternoon sun (mostly males) or on Rubus flowers (females). In August, when Rubus shows only sporadic flowers, Neocnemodon seems to be the only insect that systematically feed on these. The frequency of Neocnemodon species, as shown by maps 173 - 177, is therefore greatly underestimated.
N. brevidens is so far only known from the northern half of the country. This may be so, but it seems rather improbable.
Early May - mid June, and again mid July - early September; so there are almost certainly two separate broods.

194) Neocnemodon latitarsis :

This is probably our rarest Neocnemodon (N. verrucula has not yet been discovered here). Only four males have so far turned up in three widely different habitats, so that we do not know much about its habitat preference. It was taken twice in the sea-dunes (ES.28/29) 9.4.1978 and 21.7.1978 on Prunus serotina (undergrowth in a very arid old pine plantation) at Brasschaat (FS.08) 27.5.1978 and flying among tall grasses in a humid poplar plantation at Erps Kwerps (FS.04) 21.8.1983.

195) Neocnemodon pubescens :

In contrast to the other three Neocnemodon this is a univoltine spring species taken in woodland all over the country.
Mid April - mid June; peak : early May.

196) Neocnemodon vitripennis :

Records may still be lacking from some parts of the country, yet this is surely the commonest and most widespread species of the genus. (It must not be forgotten that only males could be taken into account, and they are far less often taken than the unidentifiable females). It probably occurs in any kind of wooded habitat, also orchards and gardens.
Early May - mid September without gaps; relative peaks mid May and August.

197) Olbiosyrphus laetus :

There is a single records of this species, which is presumably extremely rare all over western Europe. A female was taken and identified by P. SCHOORL (Amsterdam) in the dark interior of a wood near Lorcé (FR.98) 13.7.1978.

198) Orthonevra brevicornis :

All records are from the middle section of the eastern half of the country, but the species no doubt occurs in the south, too, in various kinds of woodland, bog and even abandoned orchards. This tiny black fly is rarely seen and probably quite local. It remains hidden in the vegetation : Malaise traps and sweeping may have better results than the fly net.
Mid April - early June : a univoltine spring species with a peak mid May.

199) Orthonevra elegans :

This wetland species with beautifully banded eyes must be feared to be on its way out in this country. It was last mentioned from the Hautes Fagnes, but that is now 35 years back and the recent thorough sampling of the region has failed to unearth more specimens.
Mid May - mid July; also an incompletely dated specimen in August.

200) Orthonevra geniculata :

A fair number of recent captures show that this wetland species is still prospering. So far it is known only from the north and the extreme east.
Mid April - mid June (all captures after mid May were from sites above 600 m.) : a univoltine spring species.

201) Orthonevra intermedia :

This species is known in NL from larger mesotrophic marshes, a very scarce habitat here. J. VERBEKE took the only two specimens known so far : Overmere (ES.65) 3.8.1941 and Lichtaart (FS.37) 24.6. 1941; a summer species ?

201) Orthonevra nobilis :

This woodland species is the commonest of the genus, though it occurs only in the eastern half of the country, mainly south of the Meuse valley but also very locally on the low plateaux north of it.
Mid May - late August, without noticeable peaks.

203) Orthonevra splendens :

Apart from an isolated population in an urban site at Hoboken (ES.97) and a single specimen recorded from Manderfeld (LA.07), it is known only from the centre of the country. It appears to be particularly numerous along the contact zone between the northern plain and the first hills of the Brabant District. It is mostly seen in humid places : wooded marsh and fen as well as the edges of humid forest.
Early May - early October, with only three July records (1, 13, 22) and distinct peaks mid June and the latter half of August.

204) Paragus albifrons :

There are only five records (three of them recent) from valley sites in the Ardennes.
June and July.

205) Paragus bicolor :

The only two records date from last century : Genk (FS.74) 10.7.1897 and Vogenée (FR.06) 7.6.1894.

206) Paragus finitimus :

This is a very local species, mainly in the eastern half of the country.
The scattered records range from mid May to August.

207) Paragus flammeus :

This mountain species was taken twice by JACOBS in August 1895, either at Han-sur-Lesse (FR.55) or Heure-en-Famenne (FR.67) : the label is all but illegible.

208) Paragus haemorrhous :

This tiny black hoverfly, long confused with P. tibialis, is the only widespread and fairly numerous species of the genus. It occurs on sandy soils or limestone and chalk grassland.
Early May - late September, most numerous from July till early September.

209) Paragus majoranae :

A xerophilous species known from a few sites scattered over the eastern half of the country.
Mid May - late August.

210) Paragus tibialis :

This is a very rare and local species, more so than in neighbouring countries, where it occurs mainly in the sea-dunes. The only reliable records for Belgium: Postel (FS.58) 11.7.1922; Croix Rouge (FR.80) 23.7.1950; Knokke-Heist (ES.18) 3.8.1979; 16.8.1978.

211) Parasyrphus annulatus :

Nearly all records are from the south-east, but even there they usually concern single specimens. In the centre annulatus is very local.
There are single records from late April and early May, but the main flight period is late May - late August. As in Nederland it is known only from mid May to mid July, it is possible an additional brood develops in Belgium.

212) Parasyrphus lineola :

This species of dry woodland (mainly conifer forest) is by far the commonest Parasyrphus. Yet, it seems restricted to the eastern half of the country and even there it is fairly frequent only south of the Meuse Valley and in some heathland sites in the north.
Late April - late September; records become more numerous from mid July onwards and a peak is reached late August.

213) Parasyrphus macularis :

As a mountain species has but a limited range in Belgium; it is known only from the extreme east, especially the Hautes Fagnes.
Early May - early August.

214) Parasyrphus malinellus :

A woodland species with a single spring generation, apparently scarce in the north and fairly widespread in the south-east. It may have been overlooked to some extent, as it has turned up in quite a few Malaise traps when the spring weather was clement.
Early May - mid July (after mid June only at high altitude).

215) Parasyrphus nigritarsis :

A boreo-montane (?) species, known from very few captures in G.B., NL, Norway, though in the Italian Alps it is not uncommon. Surprisingly enough the four specimens known from Belgium were taken in the northern half of the country: Wilrijk (ES.96), 17.5.1980; Hoboken (ES.97) 18.5.1980; Haasrode (FS.23) 1967; Ernage (FS.10) 6.5.1986; all in various wooded sites (parkland, abandoned orchards, forest).

216) Parasyrphus punctulatus :

This species appears to be locally numerous in most parts of the country. It is taken mainly (or is it exclusively ?) in or near conifer woods. The flight period is different in Belgium and N'Holland. Here it is known from late March till early July (NL : late March - early June). Peaks in B : May and early June (NL : April and early May). Most, but not all, later records are from the higher plateaux.

217) Parasyrphus vittiger :

There are strikingly few records of this woodland species, which is usually taken together with lineola, though in smaller number. Vittiger is a very local species, especially in the north and centre.
Early May - early September; relative peak late July - early August.

218) Parhelophilus consimilis :

As it is linked to a type of habitat (lowland Sphagnum bog) which is (and has been for a long time) very rare here, there are very few records : Hoogstraten (FS.29) 1.6.1918; Overmere (ES.65) 1944. It must be presumed extinct in this country.

219) Parhelophilus frutetorum :

This is an uncommon species of fens and humid deciduous woodland, rarely if ever taken in number. Most records are from the eastern half of the country, but it is not yet known from the Ardennes.
Mid May - late July (mainly late May - mid June) and a single early September record.

220) Parhelophilus versicolor :

The general distribution pattern is similar to frutetorum, with which it is reputedly often taken together. It is locally faily numerous, particularly in marshes.
Mid May - mid August; peak : late May -early June.

221) Pelecocera tricincta :

This tiny fly is known to visit Hieracium in sandy regions and chalk grassland. There are a number of old records from the Kempen District, as well as a very recent one from the Lorraine District, just south of the border.
Early July - late September. An endangered species.

222) Pipiza austriaca :

This is definitely one of the commoner Pipiza species, absent only from the northwest.
Early May - mid September with a brief interruption 13.7 - 2.8. Two separate broods with a first and minor peak mid May and a more pronounced one late August.

223) Pipiza bimaculata :

Records are scattered all over the country. In a number of Malaise traps a fair number of specimens were taken, so that it may be more frequent than actual records suggest.
Early May - late August, briefly interrupted early August. The spring generation is far more numerous (principally mid and late May).

224) Pipiza fenestrata :

There have been rather few specimens that keyed out to fenestrata in COE, 1953 and these had been taken over most of the country, except the north.
Nearly all captures date from mid April - late May, only three from late summer, after two months' interruption.

225) Pipiza festiva :

This appears to be a xerophilous species, known so far from a few records in the sea-dunes, the Brabant District and the Meuse Valley.
May - mid June, and again late August.

226) Pipiza lugubris :

The distribution pattern shown in map 226 is rather peculiar : the most wooded parts of the country are almost blank. Also, there are rather many U.T.M.-squares where the species has not been taken again since 1950. Locally, however, it is still prospering and the commonest Pipiza.
Early May - late September, briefly interrupted mid July. The second brood is far more numerous.

227) Pipiza luteitarsis :

There are only four records, all from the province of Liège, suggesting a very limited range in Belgium.
As in NL it is a univoltine spring species : May.

228) Pipiza noctiluca :

Unless noctiluca turns out to be a complex of species as STUBBS (1983) presumes, it is by far the commonest and most widespread of the genus.
Early May - early September (flight interruption 6 - 21 July). The spring generation (peak : late May) is more numerous than the summer brood (peak : mid August).

229) Pipiza notata :

Though this small fly is often considered to be a variety of bimaculata it is retained here for further reference. A limited number of specimens were taken in Malaise traps.
May - June.

230) Pipiza quadrimaculata :

Though a woodland species like all (?) Pipiza this seems to prefer more humid sites. There are a few records from the northern half of the country, but quadrimaculata occurs mainly in the south-east; it is locally more abundant than any other Pipiza.
It flies mainly from early May till early July, but scattered records continue till mid August.

231) Pipiza signata :

Like notata this is quite a doubtful species, but it has been retained for the same reason. The few available records (only males were considered) suggest it occurs mainly in the contact zone between the northern plain and the first hills of the Brabant District (very humid deciduous woods).
Two records in May, eight between August and mid September.

232) Pipizella annulata :

The broad and flat transparent surstyli are unmistakable, so that the male genitalia can be recognised with the naked eye. Also the light parts of the legs are much clearer yellow than is normally the case in Pipizella, but this feature is shared by the rather similar looking Trichopsomya, Heringia, Triglyphus and Neocnemodon. Annulat is the most widespread of our rarer Pipizella, but even so it occurs only in the south, mainly on chalk and limestone.
Late May - late August.

233) Pipizella divicoi :

A xerophilous species, known only from chalk and limestone sites in the valleys of the Meuse and Lesse.
Mid May - late June, probably univoltine.

234) Pipizella maculipennis :

As a southern mountain species this is almost certainly not indigenous. There is one single record : a stony urban site, Antwerpen ES.97) 12.6.1976, probably a stray in that extremely hot and dry summer.

235) Pipizella varipes :

The only really common and widespread (eurytopic) Pipizella of our regions is probably frequent all over the country, but it is often overlooked because of its smallness. It lands in most Malaise traps.
Early May - late August, plus a single mid September record. Numbers vary little through flight period : apparently the generations succeed each other without diapause.

236) Pipizella virens :

Normally the largest of our Pipizella, virens is reputed to be quite a rare species in neighbouring countries. Seen in this perspective the number of Belgian records is surprisingly high, always remembering that only males have been retained. It occurs in deciduous woodland; as this habitat type is virtually lacking in the west, virens has an easterly distribution pattern. About half the records go back to pre-1950 days, but in recently explored forest sites virens was still seen to prosper.
Early May - late August; peak : early June.

237) Pipizella zeneggenensis :

A very rare and local xerophilous species with a distribution like divicoi.
Late May - early June; probably univoltine.

238) Pipizella spec.:

A still unnamed species, known from a single male taken in a small suburban nature reserve : Wilrijk (ES.96) 17.6198O. Recently several Alpine specimens from various countries have turned up, so it must be (like maculipennis) a mountain species that had strayed into this country.

239) Platycheirus albimanus :

This is a generally distributed common and numerous species, with some preference for wooded sites, however.
Late March - early November, with peaks around mid May, July, mid August and early September.

240) Platycheirus ambiguus :

Obviously this univoltine woodland species is often overlooked because of its likeness with albimanus, but even so it must be rather local. As albimanus is already quite numerous in the same sites and at the same time ambiguus can only be spotted by systematical examination of all grey-marked platycheirus on spring flowers and blossom. Prunus spinosus is a likely food plant. The distribution of ambiguus is imperfectly known, but it may occur scattered all over the country.
April - May; the peak eclosure depending on the weather.

241) Platycheirus angustatus :

Like many common Platycheirus angustatus is a grassland species, but it is more frequent in humid surroundings. As Malaise trap results show it is probably present almost anywhere, though it is not so often seen. Sweeping through tall grasses and waterside vegetation usually reveals its presence. Whereas females are unmistakable the males are easily confused with Melanostoma scalare, so the forelegs should be examined through the lens. Though angustatus may be ubiquitous, it is generally less numerous than e.g. clypeatus or peltatus.
Mid April - mid September. There are two pronounced peaks; the first one late June (when so many hoverflies reach a low !), the second late August - early September.

242) Platycheirus clypeatus :

This is another common and widespread grassland species, particularly abundant on Molinia facies.
Early April - late September (NL : early May - late October); numbers are fairly stable, except for the first half of August, when they are much higher.

243) Platycheirus discimanus :

An early spring species, with grey tergite markings like albimanus, but commonly much smaller. It should be looked for on Salix catkins. It may have been overlooked to some degree, but nevertheless it is definitely rare and local. There are very few records and little is known about its range.
Early April - early May.

244) Platycheirus fulviventris :

In the northern part of the country fulviventris is fairly frequent in wetlands and it is sometimes seen in number. In the rest of the country it is much rarer, though single specimens sometimes turn up while sweeping tall grasses.
Late April - mid September; relative peaks : late May - early June, and again mid and late August.

245) Platycheirus immarginatus :

Owing to inaccurate or insufficient definition in most handbooks (except STUBBS 1983) immarginatus is often confused with clypeatus. Records outside the Maritime District should be treated with the greatest circumspection. Even in the coastal region immarginatus is quite rare and local as brackish habitats are very limited in number.
The known records date from May and August.

246) Platycheirus manicatus :

This is a fairly common and very widespread species, though it is only seldom met with in any number, except on salt marshes and in the Maritime District. It is considered a migrant species and part of our populations may be immigrants from the south. Unlike the other numerous immigrants, its numbers vary greatly though from year to year.
Mid April - mid October (NL : mid May - late August). There seem to be two population (or immigration)waves, the first one (mid May - late June) being much greater than the second which is at its highest mid August - early September.

247) Platycheirus ovalis :

This species, described by BECKER as late as 1921 after a few specimens from the Urals, has been discovered in most countries of western and central Europe these last decades. As far as we know no older material has been found in any of these countries.
Ovalis closely resembles the very common and eurytopic peltatus, but ovalis is a univoltine species occurring in wooded habitats only. Still, these days it is repeatedly taken (74 records since 1947, when the first Belgian specimen was taken FR.46). Unless it has recently become much more frequent it cannot have been overlooked for so long. A more plausible explanation is that ovalis has in recent times extended its range. This process may still be going on: M. POLLET took ovalis as far west as Wijnendale Forest (ES.05). So far there are no records from the northernmost part of the country.
Mid April - early July (mainly mid and late May); there are also two August records, but these might be due to labelling errors.

248) Platycheirus peltatus :

A polyvoltine eurytopic species occurring all over the country, seen more often on flowers than most other Platycheirus. Numbers vary greatly from year to year, but it may be dominant hoverfly species in places : in a single Malaise trap nearly 1.000 specimens were taken, though the trap was put up only late May.
Late March - late October; peaks mid May - late June and mid August - mid September. Numbers slump sharply early July - early August.

249) Platycheirus perpallidus :

This is a very rare and local wetland species. It resembles fulviventris so closely that careful comparison is indispensable. Most records, among which two recent ones, are from the north of the country.
Mid May - mid August.

250) Platycheirus scambus :

Another wetland species, more common and certainly more numerous in the Maritime and Flemish Districts than elsewhere in the country, where there are only scattered records.
Early May - mid September (peaks : late May and a more pronounced one mid August).

251) Platycheirus scutatus :

A ubiquitous species, which is seen more often in cool and dull weather.
Early April - early September; highest numbers mid May - mid June and again mid August - late September.

252) Platycheirus sticticus :

One very old record only : Sart Tilman (FS.80) 21.4.1895.

253) Platycheirus tarsalis :

This (dry ?) woodland and carr species is definitely uncommon, though it may locally fly in number. Records are scattered over most of the country.
A univoltine spring species : early April - early June (peak May).

254) Pocota personata :

A near-perfect bumblebee mimic known only from one specimen : Merelbeke (ES.54) 15.4.1946.

255) Psarus abdominalis :

It is highly improbable that this unmistakable species still survives here. There are only 4 records, and even the latest dates to 1937. It has apparently disappeared from all north-west Europe.
Late May - early August.

256) Pyrophaena granditarsa :

This red and black hoverfly is most frequent in marshes and along watercourses, but there are many records, too, from humid forests. It was repeatedly taken in Malaise traps placed in gardens and orchards, so it occurs in drier surroundings, too. It is generally distributed over the country.
Early May - late September. Except for a sharp peak late August, numbers are fairly constant throughout most of the flight period.

257) Pyrophaena rosarum :

In northern Belgium (as in NL) it is a rather uncommon wetland species (marshes). In the rest of the country it is fairly common (though easily overlooked) also in humid woodland. It is rarely seen in number, but populations seem to vary little from year to year, which is not the case with granditarsa.
Early May - late September : like granditarsa numbers vary little in the course of the flight period : generations probably follow each other without larval diapause.

258) Rhingia campestris :

No other hoverfly has so often and so widely been recorded, even though it is virtually absent from the scene late June - mid August. Its succes may be due to the fact that its larvae develop in cow dung. Nevertheless it is not restricted to man-made habitats, but swarms out all over the countryside to forage. It can be more abundant inside forests than on grassland.
Mid March - early November. It is particularly numerous May - mid June, and again, but less so, mid August - early September. The species does not altogether disappear in midsummer, though it is very rarely seen. In 1986 fair numbers of females continued to be taken throughout July in a Malaise trap. The dark colouring and tattered wings showed they were not freshly eclosed, so that it may well be that at least some hoverfly species have a considerably longer lifespan than the one or two weeks that are generally assumed (STUBBS, 1983).

259) Rhingia rostrata :

Among the oldest material kept at I.R.S.N.B. there are long series of rostrata taken in 1870 (FR.33.). This shows that rostrata, which is now all but completely extinct all over north-west Europe used to be frequent a century ago, at least locally. The oldest material that could be found back dates from 1913. As in NL rostrata may survive in one or two places, but there is no proof.

260) Scaeva pyrastri :

This large and conspicuous fly is common and generally distributed, though in some years it is hardly recorded at all. It may be assumed that many of our pyrastri are immigrants. On this subject VAN DER GOOT (1986) should be consulted (pp.18, 19). Since his manuscript was sent in a fair number of very early Belgian records have turned up, which show the situation is the same in Belgium and Nederland : 2.2.1971 (FS.10); 30.3.1971 (ES.93); 2.4.1974 (FR.49); 8.4.1974 (KA.89); 10.4.1974 (FR.18); 15.4.1976 (ES.93); 16.4.1971 (FR.42); 18.4.1942 (FS.91); 28.4.1893 (FS.74); 29.4.1894 (FR.55). As far as is known they were all females. Males appear from early May onwards and numbers gradually build up until a peak is reached mid August. This is followed by a sharp decline. Except for this last feature the data about pyrastri are not dissimilar from Eristalis tenax.
C. VERBEKE made a remarkably late capture : 15.11.1981 (ES.07).

261) Scaeva selenitica :

Like pyrastri it is a generally distributed eurytopic species and most specimens are probably immigrants, too. It has been recorded much less often than pyrastri. Whereas pyrastri is often present in number, selenitica is known mostly from single individuals. However, in Malaise traps selenitica is not only taken more often, but also in greater number. So it may have escaped observers' attention because of different behaviour patterns : more hidden among the vegetation or at different times of the day than pyrastri.
Early March - mid September (peak : June).

262) Sericomyia lappona :

A wetland and humid forest species, scarca in the Brabant District and the north-east, fairly frequent in the south-east and particularly so in the Hautes Fagnes. Locally it may occur in number; at Châtillon (FR.90) so many specimens were taken in coloured dishes that it might have been the dominant hoverfly species.
Nearly all records are from early May till mid July; later ones are quite scarce, but continue until mid September (NL : early May - early June).

263) Sericomyia silentis :

This is a wetland species, known from all regions except the Maritime District, but apparently absent from large parts of the country, even when suitable habitats appear to be present. It is a fairly frequent species in the south-east, much less so elsewhere.
Whereas lappona is essentially a spring species, silentis is a late summer hoverfly, though records stretch from mid May to mid October. A first (minor) peak is reached early July, but in August numbers are much higher.

264) Sphaerophoria abbreviata :

In humid heaths this inconspicuous small and dark Sphaerophoria may be abundantly present; records from other habitats are scarce and concern single specimens. As in the other species of the S. menthastri-group females are not identifiable, so the maps were based on males only, which in part explains the scarcity of entries.
Early May - late August. There is a first peak early June (when the flies feed on pollen of Cyperaceae and Poaceae) another early August (when they appear to swarm out to forage on early flowering Calluna).

265) Sphaerophoria batava :

This is mainly a heathland species, so it is not surprising to find it is in places common in the Kempen District, but local and scarce elsewhere.
Early May - early September; a minor peak mid May, a sharper one late August.

266) Sphaerophoria loewi :

This is a tiny fly known only from large Phragmites facies. These are not all scarce in the north of the country, yet only two records are known, one from the literature (JACOBS 1901), the other one communicated by A. RYCKAERT : Berg (FS.04) 5.8.1950. S. loewi is reputed to be one of the most elusive of our Syrphidae, so it may yet turn up again.

267) Sphaerophoria menthastri :

In Nederland this wetland species is at present the endangered of the group (VAN DER GOOT, in litt.), which was not the case a few decades ago. This must be due to the pollution of the lowland streams, near the banks of which menthastri normally occurs. Map 267 shows this deterioration has also taken place in lowland Belgium, whereas in the south, where pollution is much less of a problem, menthastri is still prospering.

Mid April - mid September. Peaks : mid and late June, late August.

268) Sphaerophoria philantus :

In range and habitat preference philantus is similar to abbreviata, but it appears to be less numerous.
Early May - late August; peak probably mid August.

269) Sphaerophoria rueppelli :

This is a small light-coloured species, which may (in warm summers ?) be quite numerous in ruderal sites with pioneer vegetation. Elsewhere as a rule only single specimens were taken. Though this species seems to prefer warm microclimates only one specimen is known from the south, where xerophilous species normally occur in certain sites on limestone. There is a record from the Hautes Fagnes in the literature, but no material has been found and it has not been retained in the map.
Early May - late September, with possible peak periods late June and late summer.

270) Sphaerophoria scripta :

In normal weather circumstances this is one of the commonest hoverflies throughout the season, numerous and generally distributed. Long spells of adverse weather may virtually eliminate one or more broods.
Mid March - late October; outside the main flight period (early May - late September) records are few in number. Most numerous in the high and late summer.

271) Sphaerophoria taeniata :

Records leave no doubt that it is the most widespread of the menthastri group. Numbers are low, though, and the species may be less prosperous than it used to be : there are rather a lot of U.T.M.-squares where it has not been taken since 1950. There is no obvious habitat link.
Late April - mid September.

272) Sphaerophoria virgata :

This species, morphologically indistinguishable in the field from batava and taeniata, is rather widespread. It has surprisingly often been taken in Malaise traps, particularly those in more natural surroundings, not in gardens or orchards.
Early May - early September, a bit more frequent late spring and late summer.

273) Sphegina clunipes :

As all sphegina are small and slender and rarely venture outside their normal habitat (damp and shady places), they are often overlooked and their range is imperfectly known. Clunipes is no doubt the commonest and most numerous of the genus. It is virtually lacking in the north, rather local in the centre, but surely more frequent in the south than is shown by map 273. When suitable habitats are sampled the species normally turns up in number.
Late April - early September. Peaks : late May - early June; late July - late August.

274) Sphegina kimakowiczi :

Though kimakowiczi was not recognised in this country until quite recently it is in fact as widespread as clunipes. When suitable habitats are sampled both species are normally taken, though in varying number. In the centre clunipes is only a little more frequent, in the south clunipes is far more abundant than its relative.
Early May - late August.

275) Sphegina nigra :

This black-faced species (formerly confused with S. verecunda COLLIN) has been taken in a very limited number of sites in central and southern Belgium, where it occurs together with the former two species. It seems possible nigra is usually very scarce, but may in exceptional years (e.g. 1981) appear in large numbers.
Early June - late August, nearly all records early and mid June.

276) Sphegina sibirica :

So far this species, discovered here only in 1983, is known only from the Hautes Fagnes (J.A.W. LUCAS , T. ZEEGERS, leg. + det.) and it may well be limited to altitudes above 550 or 600 m.
Late June - early July.

277) Sphiximorpha subsessilis :

This very rare species of broad-leaved forest is known from only 5 localities, all in the Brabant and Mosan Districts.
Mid May - late June.

278) Spilomya saltuum :

Only one record, over 100 years old : Noville-sur-Mehaigne (FS.30) 18.8.1878.

279) Syritta pipiens :

This ubiquitous species is often so abundant that is has (though it is small and inconspicuous) been recorded from about as many U.T.M.-squares as e.g. Syrphus ribesii.
Late March - early November (there is even a single December record !).
Main flight period : early May - mid October; records are particularly numerous June and August.

280) Syrphus nitidifrons :

This probably xerophilous species (see VAN DER GOOT, pp. 33, 34) is known from two records here : Godinne (FR.37) 16.6.1982; Jalhay (GS.00) early July 1986 (T.ZEEGERS, leg. + det.).

281) Syrphus ribesii :

A common, eurytopic and generally distributed species, but numbers tend to fluctuate strongly from year to year.
Mid March - mid November; main flight period mid April - mid October, with peak periods early May and the last decades of August.

282) Syrphus torvus :

A widespread and frequent species associated with woodland.
Mid March - mid October, between late April and late June records are most numerous.

283) Syrphus vitripennis :

As Syrphus ribesii, but somewhat more frequent in the northern plains than in the remainder of the country.
Late March - late November. It is not sure whether the January and February records are quite reliable. Peaks coincide with ribesii.

284) Temnostoma apiforme :

Our rarest Temnostoma has a limited range and is known only from the far south-east.
Early May - early July.

285) Temnostoma bombylans :

This is mainly a woodland species and is probably present in humid deciduous forest in most of the country. It has frequently been taken in Malaise traps (also in orchards) and may locally be quite abundant. Nevertheless there are few records from the densely wooded Ardennes.
Mid May - mid July with a strong peak mid June.

286) Temnostoma vespiforme :

The distribution pattern is almost identical with bombylans, but it is possibly associated more closely with forest habitats.
Late May - late July; peak : the first decades of June.

287) Trichopsomyia carbonaria :

Only four females of this rather poorly defined species are known from Belgium : Recht (KA.88) 16.6.1974 (J.A.W. LUCAS); Roertal (KA.99) 8.7.1984 (id.); Losheimergraben (LA.18) 5.1933; Werbomont (FR.88) 2.7.1986 (Malaise trap).

288) Trichopsomyia flavitarse :

There are rather too few records to define its habitat links. Specimens (mainly females) have been taken on bush leaves in sandy or stony ruderal sites, on the fringe of heathland pools, in woodland clearings, but also in a Malaise trap in a garden on the coast. So far there are no records from the centre of the country, so its distribution appears to be disjunctive. Flavitarse may be replaced by lucida on the low plateaux.
Late May - late July and a single late August record (freak ?).

289) Trichopsomyia lucida :

This recently reinstated species (GOELDLIN, 1974) is almost certainly restricted to ancient deciduous forest. This small black hoverfly (the rare males are rather nondescript, but the females look like tiny Pipiza) is probably far more widespread than is suggested by map 289.
This may be a bivoltine species : late May - mid June and mid July - late August.

290) Triglyphus primus :

This is another small black slender species, which is underrepresented in collections, though it may locally be quite numerous. It is probably rather xerophilous and should be looked for along road verges, railway embankments, field balks, ruderal sites on sandy or stony soils. Present records are scattered over much of the country, but it is not yet known from the south-east.
A few captures date from late May and late June, but the main flight period appears to be late July - early September, with a peak mid and late August.

291) Tropidia fasciata :

There are two specimens in I.R.S.N.B. : Carlsbourg (FR.42) 10.6.1895; St. Hubert (FR.64) 18.8.1929.

292) Tropidia scita :

This is apparently a lowland species. In the northern plains and particularly in the Maritime District records are numerous; in the centre they are widely scattered and so far it has not been taken in the south at all. In various wetland types T. scita is often quite abundant, in other humid habitats populations are much smaller as a rule.
Mid May - mid September; after mid July records are scarce. The species is probably essentially univoltine, but it develops a limited second brood.

293) Volucella bombylans :

A common species in woodland all over the country.
Late April - early September, also taken on 21.9 and 17.10. Peak : June, particularly the middle decade. Belgian data deviate considerably from the Dutch as in VAN DER GOOT 1981. In Holland the flight period is mid May - mid August, with almost no July records and only a modest number of August captures. In Belgium nearly a quarter of the toal number of records date from July and the figures for August are lower than in July. In fact there is a gradual decrease after the mid June peak.

294) Volucella inanis :

This uncommon woodland species is known only from the south-east, where it occurs in the river valleys, rather than on the high plateaux.
Mid June - mid September; peak : mid August.

295) Volucella inflata :

The rarest of our Volucella (which may have been overlooked to some degree as it is not unlike V. pellucens) has about the same range as inanis. Recent records are rather few in number and suggest its range has shrunk lately.
V. inflata is an early summer species, in contrast to the other Volucella probably univoltine.
Late May - late July; peak : late June.

296) Volucella pellucens :

V. pellucens normally occurs together with V. bombylans; both the number of captures and the number of U.T.M.-squares they have been recorded from are almost identical, though pellucens may be somewhat more frequent in the south and a bit less so in the north. The dissimilarities lie in the behaviour and in the evolution of the populations in the course of the season.
Early May - late September. Numerous from late May till late August; peak : mid June.

297) Volucella zonaria :

Records are scattered all over the country, except the higher Ardennes plateaux. In contrast to the other Volucella it is not limited to wooded sites : most captures probably concern migrating specimens and these may indeed be taken anywhere (cf. Scaeva, some Metasyrphus, ...). However, the fair number of males among the records suggests that part of our populations may be indigenous (see also VAN DER GOOT 1986, pp. 19 - 21).
Mid May - mid September (peak : late July - mid August).

298) Xanthandrus comtus :

See also : STUBBS 1983 (p. 126) and VAN DER GOOT (p.10) on the decline and partial recent recovery of this large and unmistakable species.
Up to about 1950 comtus seems to have been fairly frequent in most of the country. Like in Great Britain no records at all are known 1950-1980, but since then a number of single specimens have turned up in various places, also in Malaise traps. The available information does not exclude the possibility it is a migrating species.
Mid May - early October, perhaps most frequent in late summer.

299) Xanthogramma citrofasciatum :

So far there are no records from the north-west and the Kempen District, but elsewhere it is fairly frequent, especially in chalk and limestone regions.
Early April - late June; peak : mid and late May. As there are also a small number of records 15.7 - 18.8 citrofasciatum may be a univoltine spring species with an occasional limited summer brood.

300) Xanthogramma pedissequum :

There are records from all over the country, but rather few from the Kempen and High Ardennes, where the climate might be unsuitable.
Mid May - late September. The pattern is rather unusual : numbers are practically constant June - July and there is an isolated peak late August.

301) Xylota abiens :

This is a rather local species, rarely recorded from the centre, a bit more often from the north and south. Only single individuals seem to have been taken, also in Malaise traps.
Early May - late August; mainly mid June - mid July.

302) Xylota coeruleiventris :

This recently reinstated species, long confused with X. florum is known from the south only. It may be rather local, but in the Hautes Fagnes it is fairly numerous. Notwithstanding their size the species of the florum group often escape attention; Malaise trap records give a better idea of their frequency.
Early June - late August; peak : late June - early July.

303) Xylota curvipes :

Recorded only one, at high altitude : Baraque Michel (KB.90) 5.6.1925.

304) Xylota femorata :

This uncommon mountain species has a very limited range in the south-east.
Mid May - early August.

305) Xylota florum :

In Malaise traps X. florum is taken almost as frequently as the common X. segnis when they are placed in wooded surroundings, so it may be supposed to be more widespread than is shown in map 305. It is no doubt generally distributed all over the country, except in the Maritime District.
Late May - mid September; most numerous late June - early July.

306) Xylota ignava :

This is a rare species, obviously becoming rarer still, with quite a limited range in the extreme south and east.
June and July.

307) Xylota lenta :

This handsome remarked species is generally distributed and may some years be seen in fair number (also feeding on flowers, particularly on Rubus) especially in humid forest on fertile soil.
Early May - early August, but chiefly May and June. Later records amount to less than 10% of the total number.

308 Xylota meigeniana :

The rarest of the florum group (particularly the larger specimens are difficult to separate from florum and great care must be taken when identifying individuals of this group as all three may occur together) is known from the eastern half of the country. It is probably restricted to humid deciduous forest, e.g. in stream valleys and near brook sources.
Mid June - late August.

309) Xylota nemorum :

There are rather few records of this small and dark elusive species. Indeed it was not realized until Malaise traps were used systematically how widespread and frequent this species was in Belgium, not only in woods, but also in orchards and gardens.
Mid April - mid September, most frequent late May -early August.

310) Xylota pigra :

After X. curvipes this must be the rarest of our Xylota. Only four records, all from the south : Baraque Fraiture (FR.97) 16.5.1955; Maredsous (FR.27) 16.5.1918, Bellefontaine (FR.43) 10.6.1969; Hockai (GR.19) 11.6.1925. Probably a single brood in spring.

311) Xylota segnis :

This is by far the commonest and most widespread Xylota, known from all over the country. It is still most frequent in widely varying types of woodland, but it also seems to have adapted to other habitats, even man-made.
Late March - early November, which is a much longer flight period than any other Xylota (s.s. + s.l.). Numbers are highest early May - early September, more so in late spring than in summer.

312) Xylota sylvarum :

Like segnis (and probably also florum) this is a generally distributed species of various types of woodland, occasionally taken also in gardens and orchards. It is most frequent though in humid forest on more fertile soils and there it may occasionally be seen in large number, running about on leaves and making sweeping movements over their surface.
Early May - mid September, most numerous June - August with numbers that remain fairly stable throughout the summer.

313) Xylota tarda :

This is reputed to be a rarer species, but recent records show that this is not so. Its range is limited to the eastern half of the country, but both the Malaise trap survey as well as systematic sampling by the first author suggest it is - at least locally - not at all rare. In deciduous forest on more fertile and humid soils the species can normally be found along the edge of the woods but probably even more so in their interior. Like segnis this species is more variable than most handbooks tell us; the difference in abdominal colouration is not always a reliable characteristic either : the hind femora should always be looked at carefully through the lens.
Early June - late September, probably most numerous late July and all August.

314) Xylota xanthocnema :

There is about the same similarity between X. xanthocnema and X. sylvarum as between segnis and tarda, and this has also led to the belief that xanthocnema is very rare. There are indeed very few records, its range is even smaller than tarda and so far it was not taken in any Malaise trap. Yet, systematic examination of all sylvarum-like specimens may reveal the presence of one or two xanthocnema among them. Again like tarda neither size nor abdomen markings are really reliable and all likely specimens must be carefully viewed.
Late May - late August, like tarda more numerous in the latter half of the flight period.