Dipterists Digest

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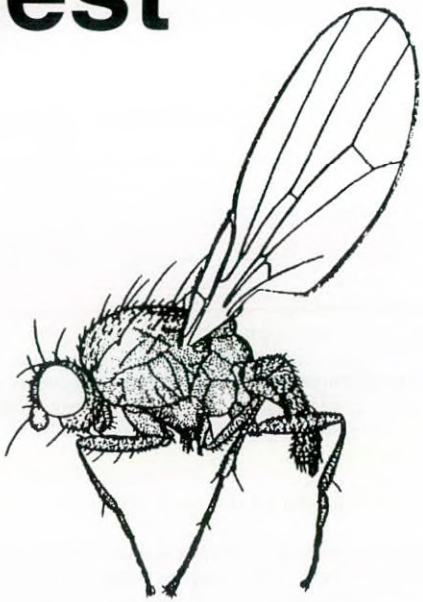
Cover illustration: George Henry Verrall.

Dipterists Digest



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Dipterists Digest

Dipterists Digest is the journal of the **Dipterists Forum**. It is intended for amateur, semi-professional and professional field dipterists with interests in British and European flies. All notes and papers submitted to **Dipterists Digest** are refereed.

The scope of **Dipterists Digest** is:

- the behaviour, ecology and natural history of flies;
- new and improved techniques (e.g. collecting, rearing etc.);
- the conservation of flies;
- provisional and interim reports from the Diptera Recording Schemes, including maps;
- records and assessments of rare or scarce species and those new to regions, countries etc.;
- local faunal accounts and field meeting results, especially if accompanied by good ecological or natural history interpretation;
- descriptions of species new to science;
- notes on identification and deletions or amendments to standard key works and checklists.

Articles must not have been accepted for publication elsewhere and should be written in clear and concise English. Items exceeding 3000 words may be serialised or printed in full, depending on competition for space. **Contributions should preferably be supplied either as E-mail attachments or on 3.5" computer disc or CD in Word or compatible formats and accompanied by hard copy.**

NEW INSTRUCTIONS: Articles should be supplied in A5 format with text in 9-point font, title 12 point and author's name 10.5 point, with 0.55" side margins. Figures should be supplied separately as jpeg files to fit in the above page format, or as hard copy.

Style and format should follow articles published in the most recent issue. A short Summary (in the form of an Abstract) should be included at the beginning of each article. References to journals should give the title of the journal in full. Scientific names should be italicised. Authors of scientific names should be given in full and nomenclature should follow the most recent checklist, unless reflecting subsequent changes. Figures should be drawn in clear black ink, about 1.5 times their printed size and lettered clearly. **Colour photographs will also be considered.** Descriptions of new species should include a statement of the museum or institution in which type material is being deposited.

Authors will be provided with twenty separates of papers of two or more pages in length.

Articles and notes for publication should be sent to the Editor at the address given above.
Enquiries about subscriptions and information about the **Dipterists Forum** should be addressed to the Membership Secretary, John Showers, 103 Desborough Road, Rothwell, Kettering, Northamptonhire NN14 6JQ

Dipterists Digest 2011 **18,** 103-106

Editorial – dedication of this issue to George Henry Verrall

The appreciation of George Verrall, provided by Adrian Pont, fully describes the important part that he played in the development of dipterology and his place in the history of the study of flies in the British Isles. Adrian's account is based on a talk that he gave at the Dipterists Forum AGM held at the Manchester University Museum on 26 November 2011, and results from many years of research into the life and work of Verrall, and his nephew and successor in the study of Diptera James E. Collin. Further information and a complete list of Verrall's publications can be found in Adrian's 1995 book [reference on p. 117] on the Verrall and Collin types. Malcolm Smart also provided a display at the Manchester meeting, relating to Verrall's life and publications, and this had previously appeared at this year's Verrall Supper, held at Imperial College on 2 March 2011.

Verrall had wide interests in Diptera and published on many families, but is best known for his two volumes in his projected series *British Flies* [references on pp 117-118], of which the first (1901) covered Syrphidae, Platypezidae and Pipunculidae and the other (1909) dealt with the families of Lower Brachycera. Apart from these families his main contributions were on craneflies (then all included within Tipulidae) and Dolichopodidae. His accounts of these groups were serialised in the *Entomologist's monthly Magazine* as 16 separate contributions on Dolichopodidae and 10 on craneflies. Here Peter Vincent has provided an account of his studies of *Dolichopus laticola*, a species first recognised by Verrall from the Norfolk Broads and still with a restricted known distribution. John Kramer (2011) has already provided elsewhere an appreciation of Verrall's contribution to the study of craneflies.

Other contributions to the present issue relate entirely to Syrphidae and emphasise advances in knowledge of this family since the then comprehensive account of the British species by Verrall in 1901, while attention is also drawn to ongoing nomenclatural changes. While Verrall's volumes of *British Flies* were well illustrated with line drawings of whole insects and diagnostic features, one aspect that was not dealt with was structure of genitalia, which has since proved so important in defining and recognising species, and in distinguishing between species that are otherwise closely similar. Study of these structures was not then entirely unknown and had been employed in some families of Lower Diptera since the 1880s (e.g. Dziedzicki 1889). They were of obvious importance in groups such as empids and dolichopodids where the structure was often visible externally, but the need for their study had not yet gained general acceptance in most groups of Diptera, especially where dissection and preparation would be necessary to achieve this. The paper on the genus *Pipizella* included here shows that separation of species in that genus is dependent on study of the male genitalia, although external characters can be used to recognise species within restricted faunal regions, as is the case with the three species found in the British Isles – two British species were recognised by Verrall as he did not separate *P. viduata* from *P. virens* (his concept of *Pipizella* also included species now placed in *Heringia* and *Trichopsomyia*).

Verrall dealt with 202 species of Syrphidae, of which 195 are presently considered to be valid. The increase since Verrall's work, to the present total of 279 species of Syrphidae known to occur in the British Isles, is perhaps more surprising than changes in knowledge of some other families dealt with by him, since they were already one of the most studied families of Diptera. Some of these additions are due to study of the genitalia, e.g. the increase from 3 to 11 species in the genus *Sphaerophoria*. Others are due to detection of previously

unrecognised external characters, as in *Brachyopa* and *Platycheirus*. An uncertain number of additions are new arrivals from continental Europe and *Volucella zonaria* (Poda) is one of the more spectacular such species. The much greater number of recent recorders has also been a factor, as shown by the number of records that have become available to the Hoverfly Recording Scheme (Ball *et al.* 2011). While many species have evidently become scarcer since Verrall's day, mainly due to loss of habitat, other species have shown increases in their ranges. The article on *Ferdinandea ruficornis* (Fabricius), as a new addition to the Scottish fauna, is one of several papers that have appeared in recent years reporting such extensions in knowledge of the distribution of species previously thought to be more restricted.

The 1901 volume of *British Flies* was such an advance over anything that had previously appeared on British Diptera that it might be surprising that it received a rather critical review by Colonel John William Yerbury (1901). His "first hurried glance through the pages" suggested a want of care in proof reading and editing, but he was particularly critical of terminology departing from that proposed by Hermann Loew, especially in respect of wing venation. He did, however, go on to praise the descriptions and accepted that order had "been evolved out of chaos". His experience suggested that several common species reached a higher latitude in Scotland than stated in the notes on distribution and he noted that only one Irish record was cited. Collin was congratulated for his skill in illustration (" a young artist...scored so distinct a success at his first attempt"). The presentation was said to be "too good" and the cost of the volume "put it out of reach to many to whom shillings are of consequence". He concluded by congratulating the author on a work that "if not perfect" was "far superior to anything that had been published before". He looked forward to further volumes and hoped that they would not be so long in preparation, otherwise the "author's prospects of life will have to be far beyond the years allotted to ordinary mortals".

It might be assumed that this review would have led to frosty relations between Verrall and Yerbury. However, there is no evidence for this as they continued regular correspondence and Yerbury visited Verrall at Newmarket on a number of occasions, as well as often being joined by Verrall and Collin in the field in various parts of the country. Rotheray (1997) stated that little of Yerbury's correspondence survives, so it should be noted that all of his letters written to Verrall and Collin are preserved in the Verrall-Collin archive at the Oxford University Museum, to which Adrian refers. There are 78 letters written from Yerbury to Verrall and 99 from Yerbury to Collin, but their replies have not survived.

Possibly as a result of his review of his first volume, Verrall asked Yerbury to proof read the entire text of the second volume published in 1909. Letters from Yerbury to Verrall over the previous year cover batches of proofs he was returning and include suggestions of improvements to the wording and terminology used. In the introduction to this volume Verrall stated: "My special thanks are due to Col. J. W. Yerbury, who has not only given me innumerable specimens which have been taken by him in recent years, but who has criticised in detail every line of the "proofs" as the work has been going through the press; I may not have accepted all his suggestions, but have done so in hundreds of cases". Percy H. Grimshaw of Edinburgh also checked the proofs and gave him details of Scottish records.

Verrall also made a considerable contribution to developing the list of Diptera known to occur in the British Isles. His two checklists [references on pp 117-118 below] particularly emphasised the importance of establishing which species had been reliably confirmed as resident in Britain. They are placed in context in the discussion of the history of British Diptera checklists in the introduction to the latest checklist (Chandler 1998, p. iv). As Adrian has described, Verrall was certainly continuing to update the list and planned to produce further editions of his checklist. It was towards this end that one of his last publications was

of another hundred new British species of Diptera (1911-1912, serialised in seven parts in the *Entomologist's monthly Magazine*). On 7 November 1903, Yerbury wrote to Verrall as follows: "My dear Mr Verrall, I am delighted to hear that I have set you a tangled skein to unravel – the fact of the matter is that at the present time we have a very imperfect knowledge of what our dipterous fauna consists. Thanks to the two editions of your list we are getting some solid ground under our feet, but some years must elapse before we reach "finality" – until that time arrives you must expect 20 or 30 species to be added per annum. Any good collector in a good district ought at the present time to add from 8 to 12 species every year – probably more if he concentrated his attention on particular families and tackled those least known and among the least known I should certainly put the Dolichopidae. I do not expect that much remains to be discovered among the Syrphidae (The only chance of adding anything new here seems to be an early spring visit (April, May & June) to Scotland), but I have no doubt that much remains to be done in both the Platypezidae & the Pipunculidae ... You will have to contemplate a 3rd edition of your list – additions, omissions, alterations in type, and transfers, are totting up fast and must have reached a biggish total by now – Always glad to set you conundrums to solve, where you are in search of such mental gymnastics – Remember me to Mrs Verrall and Believe me Yours sincerely J W Yerbury"

The comment regarding Syrphidae has clearly proved premature. The treatment of Platypezidae by Verrall was exemplary for the material available to him and included 15 species, of which two in the genera *Opetia* and *Platycnema* have since been removed from the family, the latter also dealt with by Collin (1961) as *Atelestus* in Empididae. The genus *Agathomyia* and two species (*A. collini* and *Platypeza hirticeps*) were described as new and are still valid names. It encouraged the interest of John Henry Wood of Tarrington, Herefordshire who added several species in the following decade, in the genera *Callomyia* and *Agathomyia*, and his detailed correspondence with Verrall on the identity of these discoveries is also preserved at Oxford. The British list of Platypezidae has now reached 33 species.

The Pipunculidae are rather different in that dissection of their genitalia is now considered essential and Verrall went as far as he could go without taking that step. He recognised 32 species, of which 5 were described as new, one of these (*Pipunculus incognitus*) not based on British specimens and two others have been synonymised; he also described a new variety which has since been raised to species rank as *Jassidophaga setosa* (Verrall) so, with *Cephalops carinatus* and *Dorylomorpha confusa*, three of his new species are presently valid names of British species. The present British list comprises 95 species.

In the Lower Brachycera the coverage in 1909 was much closer to present knowledge of the British fauna and later additions have accrued slowly. The presently accepted total of 159 species includes 135 of the 144 species recognised by Verrall. An account was given by him of all families then recognised in this group, including those without British representatives. The family composition differed slightly from the present day in inclusion of Xylophagidae and Athericidae within Rhagionidae (as Leptidae) and of Xylomyidae in Stratiomyidae. The following summary refers to the modern families.

Xylophagidae. Two species were included. A third species has since been recognised.

Athericidae. The three presently known British species were covered.

Rhagionidae. Of the 14 species recognised, two species of *Rhagio* have since been synonymised with other species. Two species of *Chrysopilus* and one of *Rhagio* have been added, so that 15 British species are now known.

Tabanidae. Verrall included 25 species. A further 5 species have since been distinguished, bringing the list to 30.

Xylomyidae. The three species presently on the British list were covered.

Stratiomyidae. Verrall recognised 50 species but these included 9 species in the genus *Sargus* in which only 4 species are now considered to be present in the British Isles, and one of his *Oxycera* species has since been placed in synonymy. Only four species have been added more recently, bringing the present total to 48.

Acroceridae. The three presently known British species were covered.

Bombyliidae. The nine species included by Verrall remain the only bombyliids confirmed to occur in Britain.

Therevidae. Verrall recognised 10 species, of which one (*Thereva circumscripta*) has since been regarded as a misidentification of specimens synonymous with *T. nobilitata* (Fabricius). A further 5 species have been added, bringing the present total to 14.

Scenopinidae. Two British species were recognised, which is still the case.

Asilidae. Verrall dealt with 23 species. The present total of 29 includes 5 additions and one species, *Dasypogon diadema* (Fabricius), considered to have become extinct in the 19th century and not included by Verrall.

Clearly the years of preparation and the efforts of Verrall and his contacts had led to this second volume being as comprehensive a work as could then be achieved. The only other volume of this series to appear was that on Empididae by Collin (1961), which took many years to reach fruition. In 1909 Verrall stated that two further volumes were in preparation, one on Chironomidae by himself and one on acalyptrates by Collin. Adrian refers to Verrall's manuscript notes on chironomids, and it was evidently not then appreciated that such a treatment of this family was not practicable. Soon after F.W. Edwards began to work on Chironomidae among other families of Lower Diptera and he produced a monograph of the British species (1929), in which the necessity of studying the structure of the male genitalia was evident. Collin continued to publish on many families of acalyptrates throughout his life and he probably soon realised that it was too large a group to be dealt with in a single volume in the style of *British Flies*, concentrating his attention in that respect on the empids.

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The G. H. Verrall story – a centennial appreciation

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Summary
An account is given of the life, achievements and legacy of the dipterist George Henry Verrall (1848-1911), the centenary of whose death is commemorated this year.

Fig 1. George Henry Verrall (1848-1911).

Introduction

George Henry Verrall died one hundred years ago, on 16 September 1911. Who was he, and why should we celebrate this centenary? In this brief account I hope to illustrate the importance of Verrall for dipterology, which can be broadly placed into four categories: his researches and publications on Diptera; the impetus he gave to dipterology in this country; the collection of Diptera that he formed, and the Verrall-Collin collection is without doubt the most comprehensive and important collection of British Diptera ever formed; and finally, he employed his nephew J.E. Collin as his amanuensis and trained him as his successor in dipterology.

Verrall's life and career

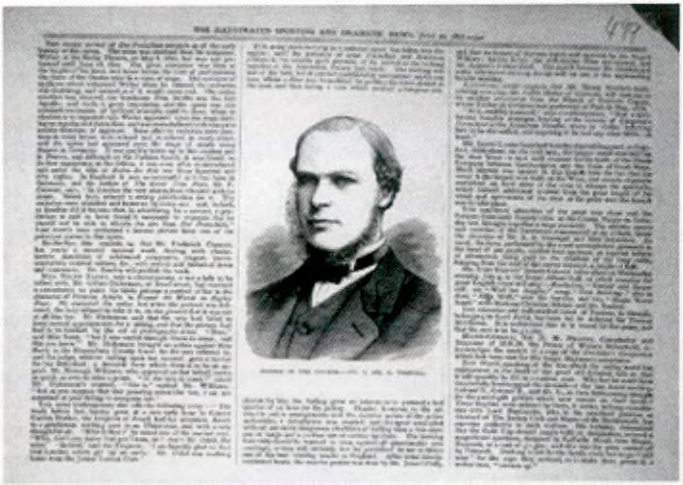
Verrall was born on 7 February 1848, the youngest of seven children in a family whose forbears had lived in the Sussex town of Lewes for centuries. The Verralls can be traced back to the early 18th century, to a Richard Verrall who died in 1737 and who was the first master of the White Hart Inn in Lewes. This 16th century coaching inn still exists as the White Hart Hotel. Rich with history, the hotel is known as the cradle of American Independence, because it is where Thomas Paine, best known for his revolutionary book *The Rights of Man* (1791), forged his radical policies in the debating club of the old inn, known as the Headstrong Club, between 1768 and 1774. His pamphlet *Common Sense* sold half a million copies in 1776 and inspired the American Declaration of Independence, signed later that year. One of Richard's sons was William Verrall (1715-1761), who succeeded his father as master of the White Hart and who wrote a celebrated cookery book that is packed with recipes that cater for gargantuan 18th century appetites and is written in a delightfully racy style.

The Verralls were evidently an upwardly mobile family for another of Richard's sons, George Verrall (1716-1801) founded an auctioneering and horse racing business which was carried on and expanded by his son George (1750-1825), grandson George (1777-1866) and great-grandson John (1805-1874). Two of John's sons, John Frederick (1836-1877) and our own George Henry were eminent figures in the racing world.

Verrall went to Lewes Grammar School and on leaving in 1864 joined the Civil Service at Somerset House. However, such a life and career were not to his taste and in 1866 he became private secretary to his eldest brother John Frederick, who was manager of the Lewes races and Clerk of the Course at Croydon. During the period 1866-1874, Verrall lived at The Mulberries, Denmark Hill in south-east London. In 1875 he moved back to Lewes, to Friar's Cottage, and upon his brother's death in 1877 he was appointed as successor in the business (Fig. 2). This he conducted with considerable success. In 1879 he married Sophie Agnes Clark but it was not a happy marriage and there were no children, though whether that was cause or effect is not clear. In the same year he moved to Newmarket, the centre of the East Anglian racing business, building himself the house called "Sussex Lodge" (Fig. 8). In 1881 he became a partner in the firm of Pratt and Company, Race Course Managers and Bankers, and maintained connections with several race courses as clerk to the course, manager, auctioneer, etc. These included the courses at Lewes, Gatwick and Lingfield.

Verrall built upon the success of his brother and forbears, and when Gatwick racecourse was founded he was one of the five principal shareholders. When he married Agnes Clark, he was also furthering his business interests for Agnes was the eldest of three daughters of John Francis Clark of Fairstead House, Newmarket, an eminent racing judge. Clark's second daughter married a Robinson, another family with racing connections that included one of Verrall's co-directors of Gatwick racecourse. The third daughter, Alice

Bertha Clark, married Philip James Danby Collin, a Suffolk farmer, and became the mother of J.E. Collin.



Figs 2-3. George Henry Verrall, at age 29 in 1877 (above) and at age 61 in 1909 (below).

In addition to his success in the field of horse racing and bloodstock sales, Verrall played a prominent role in public life. He served as a Magistrate and Justice of the Peace, as Councillor and Alderman of Cambridgeshire County Council, and member of the Newmarket Urban District Council. He fought three parliamentary elections for the Conservative party, standing for the Newmarket division of Cambridgeshire with just under 10,000 names on the electoral role. In 1906 he failed to be elected, and secured 45.4% of the votes. In January 1910 he was returned as Conservative MP for East Cambridgeshire, with a majority of 120 and 50.6% of the votes. At the end of the year he was defeated again, securing 47.8% of the votes and losing by 400.

For some years his mental and physical energy had been declining, evidence of the heart disease that eventually killed him, and he died on 16 September 1911. He bequeathed virtually his entire estate to his nephew and secretary J.E. Collin (1876-1968). His estate was valued at £58,000, of which the modern equivalent is about £5 million. His widow Agnes continued to live in Newmarket until her death in 1936, in a large house close to Sussex Lodge. She left £16,000.

Verrall's love of natural history began when he was at school, and by 1866 and aged 18 he had already decided to specialise in the Diptera. We have the following account of this, from *Baily's Magazine* of February 1909 (Fig. 3):

"Alongside this life amongst racing matters ran another existence as diametrically opposed as could be, this taking the form of an intense devotion to science, a devotion which exhibited itself very early in life. He and his brother were the two best bird-nesters in the school, and he developed an early taste for collecting butterflies and moths. In 1862 a wave of entomology swept over the school, which in due time ran its course, leaving only two survivors ... The insects of Sussex of every order were the subject of study until 1866, when eighteen years of age, after which he attended solely to Diptera, with such success that from chaos he has to date reduced the British species to about 3,000 well-recognised species. He has collected almost all over Great Britain, possesses the best collection of Diptera in England, especially of British species, and also the best library on the subject. The collection is still being assiduously added to, finds of species new to Great Britain being of frequent occurrence, and the results are in course of embodiment in a great work on British Flies, of which the second volume is just finished, each volume consisting of 800 pages. The extraordinary care and precision, combined with clearness of explanation, that are essential to such a task, must be seen to be believed ..."

Why, I have often been asked, and especially by non-entomologists, should a sociable young man take an interest in such an obscure and grubby set of insects as the flies? Why not butterflies or beetles or some other more spectacular group? Verrall undoubtedly had his own reasons, and was certainly encouraged in his study of this neglected group by other entomologists of the day such as Robert McLachlan (1837-1904) and Henry Stainton (1822-1892). But I suspect that, whatever the original impulse and probably like most other dipterists, once he began looking into the Diptera he became utterly and irresistibly fascinated. Be that as it may, he made a precocious start, publishing his first paper, describing a new species of Bibionidae, in 1869 when he was just 21 (Verrall 1869). And, with unflagging enthusiasm and few interruptions, the Diptera absorbed him for well over forty years. According to a letter from the English surgeon and dipterist Richard Meade (1814-1899) to the Czech dipterist Ferdinand Kowarz dated 30 July 1879, Verrall temporarily gave up dipterology in 1879. This was the year of his marriage and move to Newmarket. There is indeed a gap in his list of publications between 1877 and 1885, presumably the result of newly-acquired pressures in his personal and professional life.

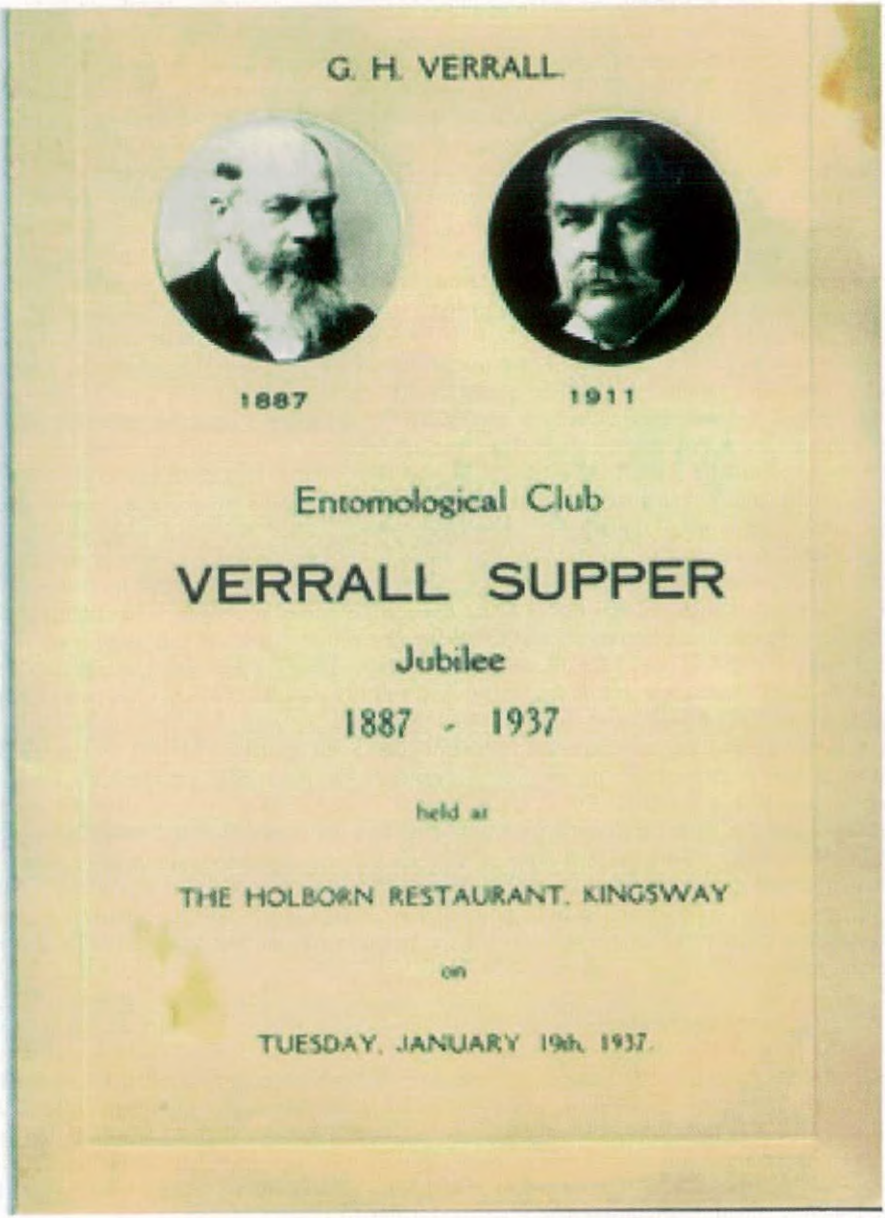


Fig. 4. Invitation to the 50th Verrall Supper in 1937

As a collector, Verrall was indefatigable and he collected Diptera intensively in Sussex and around Newmarket. He made special collecting trips to East Anglia, Devon and various parts of north and north-west Scotland, at a time when those parts of the country were still difficult of access. In the late 19th century, and before the real impact of population growth, industrialisation and environmental despoliation on the British countryside, most Diptera were much more abundant and widespread than they are today, and he was able rapidly to form a huge collection in a way that would be difficult now. With this, a comprehensive library and ample means, he was able to build up an authoritative knowledge of the Diptera.

Verrall never travelled abroad to collect Diptera, but he was by no means insular in his outlook. He travelled to European Museums to study some of the historic collections in Vienna, Berlin, Lund, Stockholm and Copenhagen. According to signatures in the visitors' book in the Museum of Zoology, Lund University, Verrall was there on 18 August 1896, and, together with J.E. Collin, again on 15 and 20-21 August 1908. He was in Paris on several occasions, firstly in May 1893 when he purchased the collection of J.M.F. Bigot (1818-1893) with its enormous number of non-European types described by P.J.M. Macquart (1778-1855) and by Bigot himself, and apparently also in 1896 and 1899. And he evidently visited Franzensbad (now Františkovy Lázně) in the present day Czech Republic, to view and purchase Diptera from Ferdinand Kowarz (1838-1914). These two collections considerably enhanced the value of his purely British Diptera and have provided an invaluable resource for subsequent generations of dipterists.

Verrall never lost his sense of indebtedness to those who had encouraged and taught him entomology and taxonomy as a young man. As he grew older, he determined to provide a forum where younger entomologists could enjoy the same benefits. In 1887 he joined the small and very exclusive Entomological Club, and proceeded to turn the meeting for which he was the host into a focal point for all students of entomology. These meetings, originally held in the Holborn Restaurant in London, developed into the so-called Verrall Suppers (Fig. 4) and have continued down to the present.

In 1866, aged 18, he joined the Entomological Society of London and took a leading role in its affairs throughout his life, being President for 1899-1901. From 1887 until his death he was also a member of the South London Entomological Society (now the British Entomological and Natural History Society). Together with Lord Walter Rothschild he was instrumental in purchasing the first acres of Wicken Fen in Cambridgeshire in 1899, which is Britain's oldest nature reserve. As an aside, we should note that he took samples of the Wicken vegetation to stock an artificial pond that he created in the garden of "Sussex Lodge" and that this may be the source of some of the unusual and unexpected records of Diptera from his garden.

Verrall's achievements in dipterology

Verrall was not what we would term a prolific writer on Diptera. He described 6 genus-group names and 77 species-group names. At the time, his pre-eminent reputation rested on his series of papers on Syrphidae in the 1870s, Tipulidae in the 1880s, and Dolichopodidae in the 1870s and again in the 1900s, his two check lists of British Diptera (Verrall 1888, 1901e), and the two monumental volumes of *British Flies* (Verrall, 1901a, 1909); and, of course, his vast and detailed knowledge of the Diptera which he was happy to share through prolific correspondence with fellow-dipterists at home and abroad.

It is difficult now to think back to the mid-19th century and to imagine how anyone might have begun to make progress with the study of Diptera. In Europe, the era of Meigen and Macquart had come to an end (Meigen died in 1845 and Macquart in 1855), and the

leading workers were Hermann Loew (1807-1878) in Germany and Camillo Rondani (1807-1879) in Italy. But in Britain the entomological describing machine known as Francis Walker (1809-1874) was still actively publishing on the Diptera as well as on many other orders of insects. Walker described over 6,300 Diptera taxa, from all regions of the world. As far as the British fauna is concerned, he published a three-volume *Insecta Britannica, Diptera* (Walker 1851, 1853, 1856) in which he described many new species, redescribed old species, and both synthesised and updated earlier treatments of the British Diptera by Stephens, Curtis and others. But Walker tried to cover too much ground, and consequently his descriptions are vague and generalised, and his judgements were frequently flawed. It was to bring order into this chaos that Verrall built up his large, comprehensive and well-sorted collection, and also assembled an enormous library of books and reprints.

Throughout his life he published additions and corrections to the British List, including several entitled "A hundred new British species of Diptera", and these culminated in *A List of British Diptera* in 1888, updated and expanded in a second edition in 1901. In each of these he expressed the wish: "let this list quickly give place to another". And after the 1901 edition he continued to update the list in the light of work being published by European colleagues such as the German muscoid specialist Paul Stein (1852-1921) (Fig. 5).

He had plans to write a series of monographs on the British Diptera, and for this series to be continued by his nephew J.E. Collin, but he did not live to progress beyond the first two enormous tomes. The first, in 1901, was designated as volume 8 and dealt with the Platypezidae, Pipunculidae and Syrphidae. It also included taxonomic catalogues of all the European species of these families (Verrall 1901b, c, d). The second volume, in 1909, was designated as volume 5 and dealt with the families of the so-called lower Brachycera, from the Stratiomyidae onwards. These are magisterial works, with detailed descriptions of all the British genera and species, their distribution, discussions of relationships, synonymies, misidentifications, and so on, and are embellished with beautiful line drawings of structural details and even of whole flies by J.E. Collin.

Verrall was a sociable and outgoing personality, with strong views, which he frequently expressed in a direct and forthright manner. For example, in 1890 whilst answering an enquiry from the young curator of Diptera at the British Museum (Natural History), E.E. Austen (1867-1938), he wrote:

"Firstly let me say that the worst prominent writer on Diptera in the last fifty years is Bigot. He is absolutely untrustworthy and has not one scrap of true science in his head. Baron Osten-Sacken (who is the best living dipterist) told Bigot himself that he ought not to write but only collect."

He had equally strong views on nomenclature and on the value of types. In 1896 he wrote that "he was of the opinion that no species should be described from a single type, but from many specimens, and he wished every so-called 'type' could be destroyed as soon as a species had been described from it."

Verrall was a prolific correspondent, maintaining close ties with other British dipterists and also with numerous European dipterists. The Hope Entomological Archive in the Oxford University Museum of Natural History contains several drawers of the Verrall correspondence, but only of the letters received by Verrall. It appears that he did not keep copies of his own letters, and in the era before typewriters and carbon paper this is hardly surprising. But some of his letters that I have seen are remarkable for their length and detail, for example an 8-page letter to W.A. Vice, a Leicestershire doctor and amateur dipterist, in which he comments on a list of Syrphidae that Vice had sent him.

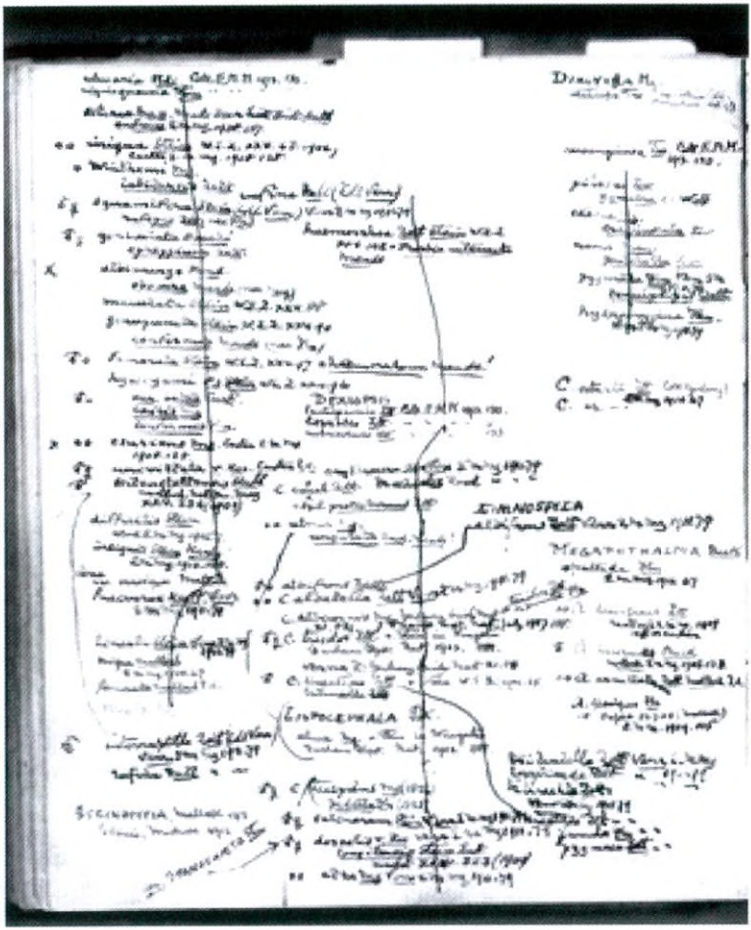


Fig. 5. A page of annotations and corrections from Verrall's own copy of his 1901 check list.

There is also the very considerable archive of papers, manuscripts, lists and notes in the Hope Entomological Archive in the Oxford University Museum of Natural History and these are housed in seven cardboard archive boxes. Verrall was a great compiler of lists. Whether it was racehorses or flies, it seems that he loved making lists, and these boxes contain draft catalogues and lists of most families of Diptera, and from different regions of the world. Two of the boxes contain A-4 sized folders with draft catalogues and lists of various families, some comprehensive and some restricted to particular regions of the world. These are compiled following the time-honoured method of literal cutting and pasting. Three boxes contain miscellaneous notes on roughly A5 sized papers, which are sorted according to families.

Some of these contain draft keys. Others appear to be preludes to more extensive works, with one sheet per genus and per species, with the taxon name followed by pertinent references. One box contains an interesting medley: a list of the Diptera in his collection, with totals of species and specimens; his interleaved and annotated copies of his Lists of British Diptera; notes on Syrphidae; and a box file of unpublished keys, descriptions and notes on British Chironomidae, apparently for a volume of *British Flies* that was never completed. The final box contains his handwritten text for the Syrphidae volume of *British Flies*; a 200-page book of horse races for which he was the handicapper, with names and details of every horse in every race; and finally, and most importantly, a list of World genera of Diptera together with references and etymologies (Fig. 6), a list that saw publication as part of S.H. Scudder's *Nomenclator zoologicus* (Scudder 1882, 1884).

Much of Verrall's work remained (and still remains) embodied in the sorting and arrangement of his collection. As is well known, this collection passed to his nephew J.E. Collin, who continued to expand it until 1967, when it was presented to the Oxford University Museum of Natural History. Basically, it contains three elements that have remained intact, although there is a slow but ongoing process to incorporate the Verrall-Collin collection into an integrated Diptera collection along with other collections that, for historical reasons, have remained separate. One element is the British collection, which consists of a "main" collection and two duplicate collections. Verrall's plan, which was followed by Collin, was to have 6 pairs of each species in the main collection, with any excess consigned to a duplicate collection. All specimens in this collection are mounted on short pins, and are pinned through a card disc with the locality and date written on the underside of the disc. The second element is the Palaearctic collection, which is mainly the material that Verrall purchased from Kowarz and Bigot, although Collin added to it with specimens that were given to him by European colleagues. Finally, the third element is the Exotic collection, which is in essence the Bigot collection of extra-European Diptera.

The British collection contains a very large number of syntypes of the species-group taxa that Verrall and Collin described. Syntypes of many of the 925 species described by these two authors have been recognised, labelled as syntypes, and for the most part have been placed in a separate "type collection".

The Palaearctic collection is very extensive, and, in addition to the syntypes of species described by Kowarz and the European species described by Bigot, it also contains syntypes from dipterists such as Becker, Bezzi, Czerny, Dziedzicki, Girschner, Laboulbène, Loew, Lundbeck, Mik, Oldenberg, Robineau-Desvoidy, Rondani, Stackelberg, Stein and Zetterstedt.

The Exotic collection contains types of Diptera described by Bigot and Macquart, and also syntypes from a number of other authors. It does not contain all the Bigot types, since certain families from the collection were presented at various times by Verrall and Collin to the Natural History Museum in London. This is a particularly important collection. Bigot himself described some 2700 Diptera taxa. Macquart worked during the 1820s and 1830s on French Diptera, and in the 1840s and 1850s on "exotic", i.e. extra-European Diptera. He described over 5300 Diptera taxa, and from 1847 until his death in 1855 almost all the "exotic" Diptera that he described were from Bigot's collection. The collection was originally stored in a series of cartons measuring about 20 x 25 cm, and when these had all arrived in Newmarket Verrall set about making a list of the entire contents (Fig. 7). Box by box, every species is listed and the number of specimens recorded. This is particularly useful when discrepancies are found between the number of specimens given by Bigot in his descriptions and the number of specimens now in the collection.

Figs 6-7. A page from Verrall's manuscript list of world Diptera genus-group names (above), and a page from Verrall's list of the contents of the Diptera collection of J.-M.-F. Bigot (below).

Databases have been prepared for these three collections and are available on the Oxford University Museum of Natural History website under: The Verrall-Collin Diptera Collection (only the types databased), Palaearctic Diptera Collection, and Bigot-Macquart Diptera Collection (see http://www.oum.ox.ac.uk/collect/entom2.htm).

Verrall's legacy

It will be clear from this brief exposition of Verrall's life and work that for British dipterology his achievements were considerable and his legacy has been of outstanding significance. His contributions can be summarised as:

- his publications, especially his monographs and the two check lists
- his collection, including the invaluable collections of Kowarz and Bigot (and also including his list of the contents of the Bigot collection)
- the annual gathering of entomologists known as the Verrall Supper
- the purchase of Wicken Fen
- and, finally, his nephew James Edward Collin

Acknowledgements

Much of the information in this review has been adapted from my book on the Verrall-Collin Diptera (Pont 1995), which also contains a full listing of Verrall's dipterological publications. I am grateful to John Kramer for copies of Verrall's letters to W.A. Vice, to Ian McLean for photographs of Sussex Lodge taken in 1983 and to Alison Plumridge, director of the Smiths Row Art Gallery, Bury St Edmunds, and great-granddaughter of George Collin, J.E. Collin's brother, for much additional information.

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Fig. 8. Sussex Lodge, Newmarket (taken in 1983).

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Ferdinandea ruficornis (Fabricius) (Diptera, Syrphidae) new to Scotland

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Summary

A second *Ferdinandea* species, *F. ruficornis* (Fabricius), is reported from Scotland for the first time. This is regarded as a rare or even endangered hoverfly in different parts of Europe.

In the Palaearctic region, six species of the genus *Ferdinandea* Rondani, 1844 are known (Peck 1988), but only four species have verified taxonomic status (Speight 2011). Speight and Sarthou (2011) provided a key to these four species, which incorporated information from Ricarte *et al.* (2010).

In the British Isles, only *Ferdinandea cuprea* (Scopoli, 1763) and *Ferdinandea ruficornis* (Fabricius, 1775) are known. Both appear to have distributions centred on southern England, although *F. cuprea* is fairly common in Wales and has a scattered distribution throughout Scotland. *Ferdinandea ruficornis*, however, is only known from southern England and a single Welsh locality; the most northerly record is an outlier in North Yorkshire (Ball *et al.* 2011).

On 8 August 2011, a field trip to Rowardennan, the University of Glasgow Field Station on the eastern shore of Loch Lomond, followed the 6th International Symposium on Syrphidae at the Hunterian Museum, Glasgow. A male *Ferdinandea* was collected by J. Quinto from a *Ligustrum* flower near the car park of the field station. The specimen, which has been deposited in the collections of National Museums Scotland, was rather smaller than usual for *F. cuprea*. The specimen was dissected and compared with Iberian specimens of *F. ruficornis* and keyed out using Ricarte *et al.* (2010). The Rowardennan specimen had a dark orange antennal arista, distiphallus with very elongate hook-like ventral lobe and abdomen blackish in overall appearance; tergites II and III had black hairs posteriorly, as had a British male of *F. ruficornis* from Worcestershire, England (Ricarte *et al.* 2010).

The specimen of *F. ruficornis* was found about 300km further north than the previous most northerly record in North Yorkshire (Ball *et al.* 2011). The habitat surrounding Rowardennan is composed mainly of oaks (*Quercus*), spruce (*Picea*) and pine (*Pinus*). Sap runs on *Quercus* are a known development site for *F. ruficornis* (Ricarte *et al.* 2010, Speight 2011). The date the specimen was collected at Rowardennan is within the known adult flight period (Speight 2011).

In mainland Europe, *F. ruficornis* seems to be the rarest species in the genus. In the Iberian Peninsula, the species is rarely recorded (Ricarte *et al.* 2010) and, in the Netherlands, it has become very rare since 1950 (Reemer *et al.* 2009); also, in Denmark, it is categorised as

regionally extinct (Den danske rødliste 2004). Hence, it is encouraging to discover a new locality for this species, but whether the record detailed here represents an isolated individual or a breeding population in the Loch Lomond area is unclear. Possibly, it is under recorded in northern England and Scotland and, given the encouragement of the record presented here, further targeted searching for this enigmatic species is clearly required.

Acknowledgements
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The hazards of hoverfly names (Diptera, Syrphidae)

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Summary
Nomenclatural changes in Syrphidae are discussed and the retention of established usage wherever possible is supported. The background to some recent name changes is explained and the need to adhere rigorously to the rules and decisions of the International Commission on Zoological Nomenclature is stressed.

Introduction

Due to the popularity of hoverflies and consequent number of authors producing revisionary works, the nomenclature of Syrphidae has undergone considerable changes and upheaval since Verrall's treatment of the family in *British Flies*. Of the 195 species recognised by Verrall (1901) that are currently considered valid, perhaps remarkably 111 are still known by the same genus and species name, ignoring small changes of spelling. Of the remainder, 57 have changed their genus, but retained their species name, although this may have changed its ending if the gender of the present genus differs; 20 have changed their species name but remain in the original genus, while only 7 have changed both genus and species names.

Many of the nomenclatural changes proposed during the past century have later been abandoned, the most significant being those resulting from temporary acceptance of generic names proposed without included species by Meigen in 1800. Those names were advocated by E. Rivenhall Goffe, who also proposed other generic changes opposed by other workers. The 1800 names were suppressed by the International Commission on Zoological Nomenclature (ICZN), which is the final authority on such disputes. Because some changes proposed more recently in Syrphidae were considered inappropriate, applications were made to ICZN (Iliff and Chandler 2000, Chandler *et al.* 2004), resulting in Opinions (ICZN 2001, 2006) supporting these applications. Speight (2011) accepted most of these conclusions but disputed one of those in the genus *Chrysotoxum*. It was therefore considered necessary to discuss this issue and explain the background to these applications.

The reasons for name changes and the role of ICZN

Much change is due to taxonomic revisions, such as the splitting of the formerly large genus *Syrphus*, which is not yet fully resolved and there are differences in interpretation between all recent identification works. Other changes are due to the recognition that two or more species have been confused under the same name as happened with *Brachyopa bicolor* (Fallén, 1817); in literature before 1939, when this was recognised to be the case by J.E. Collin, the name *B. bicolor* could apply to any of the four species of this genus found in Britain. Revision of early type material has shown that some names have been misapplied and changes in specific names have resulted due to following the law of priority.

In the case of names applied by Moses Harris identification is based on his illustrations, as his collection apparently did not survive him. Goffe (1946) was mainly responsible for reviving Harris' names, which had been ignored by most earlier authors. He commented that Verrall had apparently accepted the view expressed by A.H. Haliday that Harris' nomenclature was not binomial, but Verrall had nevertheless brought forward and used Harris' names for four distinctive species: *Cheilosia illustrata* (Harris, 1780), *Chrysotoxum*

cautum (Harris, 1776), *Tropidia scita* (Harris, 1780) and *Xanthandrus comtus* (Harris, 1780). Goffe (*op. cit.*) reproduced the statement by Verrall under *T. scita* that Harris should not have been ignored, as he was "more than an equal with his contemporaries in nomenclature whilst he was almost fifty years in advance of any other dipterologist in venation", justifying restoration of the name *scita* by the comment "though I would wish to work in accordance with Osten-Sacken's views of continuity versus priority I cannot accept them when I think that there has been wilful and perverse neglect of thoroughly good scientific work". Goffe added that if Verrall had acted accordingly in all cases his paper would not have been needed.

Following the rule of priority, Goffe proposed that a further 14 Harris names be brought into use, only five of which are presently recognised as valid. These five also include some distinctive species [name used by Verrall in brackets]: *Epistrophe eligans* (Harris, 1780) [*Syrphus bifasciatus* (Fabricius, 1794)], *Sericomyia silentis* (Harris, 1776) [*S. borealis* (Fallén, 1816)], *Pocota personata* (Harris, 1780) [*P. apiformis* (Schrank, 1781)], *Xanthogramma pedissequum* (Harris, 1776) [*X. ornatum* (Meigen, 1822)]. The fifth such name was *Myolepta potens* (Harris, 1780), which Goffe used for the only species of this genus then recognised in Britain, *M. luteola* (Gmelin, 1790) of Verrall, a preoccupied name that in any case required replacement. The name *potens* was, however, later transferred to the species currently known by that name when it was discovered and *luteola* continued to be used until Thompson and Pont (1994) brought forward the name *dubia* (Fabricius, 1805) for *luteola* of Verrall.

In other cases, e.g. *lyra* Harris, 1776 (considered by Goffe to be a senior synonym of *Eristalis abusivus* Collin, 1931), the identity of Harris' figures cannot be conclusively demonstrated and Goffe's conclusion has not been generally accepted by subsequent authors. Goffe followed Sherborn and Neave in regarding 1776 as the publication date for all of Harris' species, while noting clear evidence that some had been published in 1780. Thus he proposed that *fulva* (Harris, 1780) had priority over *Arctophila mussitans* (Fabricius, 1776) of Verrall (1901), which he believed to have been described in 1777. Harris' name was used for a time until it was decided that *superbiens* (Müller, 1776), the name presently used for this species, had priority over both *fulva* and *mussitans*; Verrall had decided not to use *superbiens* as he considered the description unrecognisable. That there should be such doubt over which name has priority for such a distinctive species is clearly unsatisfactory.

In the latest edition of the International Code of Zoological Nomenclature (ICZN 1999a) the principle of priority has been relaxed, in that names that have not been used since 1899 can be set aside even if it is shown that they have priority over currently used names, when those names have "been used as valid by at least 10 authors in 25 publications during the past 50 years, and encompassing a span of not less than 10 years", likely to apply to most Syrphidae. This should avoid the reintroduction of some other Harris names of dubious identity that were not revived by Goffe, but may have priority over currently used names in *Cheilosia*, *Platycheirus* and *Rhingia*. It does not resolve cases such as *funebres* Harris, 1780 and *corydon* Harris, 1780, which were temporarily used following Goffe (*op. cit.*) for *Cheilosia variabilis* (Panzer, 1798) and *C. grossa* (Fallén, 1817) respectively (see Note 4 under Syrphidae in Chandler 1998b, where it was "considered desirable that any further instances of re-introduction of names unsupported by identifiable type material, is avoided").

The loss of familiar names is always regrettable but it is most unfortunate when a revision shows that a name has been misapplied and results in its transfer to another species, whether of the same or another genus. This situation arose in Syrphidae and Conopidae when Thompson *et al.* (1982) and Thompson (1997) revised the surviving specimens of some families of Diptera in the collection of Carl Linnaeus, now in the possession of the Linnean Society. In these papers conclusions were drawn from specimens that were believed to be

"types", i.e. specimens on which Linnaeus' original descriptions had been based, and lectotypes were designated in these cases. It was recognised by David Iliff (1995) that some of these specimens did not fit Linnaeus' descriptions and it has become increasingly apparent that specimens now standing over names in that collection cannot be reliably assumed to have been those from which his descriptions were made. This was to some extent realised by Thompson *et al.* (*op. cit.*) as they did not accept as types the specimens under *Eristalis arbustorum* (Linnaeus, 1758) [*E. tenax* (Linnaeus, 1758)] or *Rhingia rostrata* (Linnaeus, 1758) [*R. campestris* Meigen, 1822] and they maintained previous usage of those names.

In most cases Thompson *et al.* (*op. cit.*) found that specimens in Linnaeus' collection fitted the species for which those names had previously been used. Of the six cases where they proposed replacement of existing names, three have been generally accepted, two because of priority: *Chrysogaster cemiteriorum* (Linnaeus, 1758) [= *C. chalybeata* Meigen, 1822] and *Pipizella viduata* (Linnaeus, 1758) [= *P. varipes* (Meigen, 1822)]. In the third case *Doros profuges* (Harris, 1780) was introduced as the oldest available name to replace *D. conopseus* (Fabricius, 1775), even though that had priority. The reason was that although *conopseus* of Fabricius undoubtedly related to the *Doros* species, it was deemed to be an emendation and misidentification of *Musca conopsoides* Linnaeus, 1758, which was itself confirmed to relate, as previously supposed, to *Ceriana conopsoides* (Linnaeus, 1758). There is some justification for retaining the name *conopseus* but that has not been raised with ICZN.

The problems that were considered to require the involvement of ICZN for resolution concerned the genera *Chrysotoxum*, *Xanthogramma* and *Eristalis*. Based on specimens in Linnaeus' collection, Thompson *et al.* (*op. cit.*) transferred the name *Musca festiva* Linnaeus, 1758 (previously used for *Chrysotoxum festivum*) to the species previously known as *Xanthogramma citrofasciatum* (De Geer, 1776) and more contentiously transferred the name *Musca arcuata* Linnaeus, 1758 to *Chrysotoxum festivum* of previous authors. They introduced the name *C. fasciatum* (Müller, 1764) for *C. arcuatum* of previous authors, believing it to be the next most senior available name for that species. Consequently many works published since 1982 have followed these changes and used the name *C. arcuatum* for a different species to that for which the name had been used for the previous 224 years.

In *Eristalis*, although as indicated above the specimen under *E. arbustorum* was *E. tenax*, Thompson *et al.* (*op. cit.*) considered that Linnaeus' description fitted the species to which the name is usually applied. However, the specimen under *nemorum* Linnaeus, 1758 was *E. arbustorum*, leading them to place that as a synonym of *arbustorum* and they applied the name *E. interrupta* (Poda, 1761) to the species previously known as *E. nemorum*. This was complicated further when Thompson and Pont (1994) decided that the name *Musca horticola* De Geer, 1776 was also synonymous with *E. arbustorum* and proposed that *E. horticola* of previous authors should be called *E. lineata* (Harris, 1776).

Iliff (1995) pointed out that *Musca festiva* Linnaeus, 1758 could not apply to a *Xanthogramma* as its antennae were described as long and black, while they are short and yellow in the latter, so it was clear that the surviving Linnaeus specimen was not a "type" of *festiva*. Following discussion with David Iliff it was decided that this could only be resolved by an application to ICZN, which should deal conclusively with the identity of the relevant names in both genera. We considered that this was necessary to resolve these cases because Syrphidae are the subject of many publications and it is desirable that nomenclature be both consistent and accurate. Preparation of such an application is an arduous process and is not undertaken lightly. Chandler (1998b) referred to many cases in other families where current usage does not adhere to the rules of nomenclature and where such an application would be

desirable to fix this and validate present usage, but it is not surprising that most taxonomists prefer to accept the status quo without taking that formal step.

Consequently Iliff and Chandler (2000) made the case for restoring the familiar nomenclature of earlier authors in the three affected species of *Chrysotoxum* and *Xanthogramma* and this was accepted in an Opinion of the Commission (ICZN 2001), in which neotypes were designated for *Musca arcuata* and *M. festiva*, enabling the restoration of the names *Chrysotoxum arcuatum* and *C. festivum* to the species so called before 1982, at the same time restoring the name *Xanthogramma citrofasciatum*. The detailed arguments presented, in favour of this and the other applications discussed below, are not repeated here.

Following the success of that application, it was considered that the nomenclature of *Eristalis* should be similarly resolved and Chandler *et al.* (2004) proposed that the traditional usage of *E. arbustorum*, *E. nemorum* and *E. horticola* also be restored by designation of neotypes. At the same time the opportunity was taken to confirm the gender of *Eristalis* as feminine, since its gender had been inconsistent in recent literature. The Commission also accepted these proposals (ICZN 2006).

A similar case to *Chrysotoxum arcuatum* resulted in Conopidae when Thompson (1997) studied material of that family in Linnaeus' collection and transferred the name *Myopa testacea* (Linnaeus, 1767) to *M. extricata* Collin, 1960, without proposal of a new name for *M. testacea* of previous authors, which lacked any synonyms. The Commission again supported earlier usage (ICZN 2011), following an application by Clements *et al.* (2008).

The only other application to the Commission with which I have been involved concerned fixing of the name for the "carrot-fly" *Chamaepsila rosae* (Fabricius, 1794), which preceded those mentioned above (Chandler 1998a) and was supported by an Opinion (ICZN 1999b). This was necessary because the name of this well-known pest species had been affected by Thompson and Pont (*op. cit.*), who proposed the new name *C. hennigi* because the name *Musca rosae* Fabricius, 1794 was preoccupied by the syrphid name *M. rosae* De Geer, 1776 (itself a synonym of *Musca pyrastri* Linnaeus, 1758, now *Scaeva*). This is mentioned here because Thompson and Pont (2008), being unaware of the ICZN ruling, suggested that *C. hennigi* was the correct name for this species; although they and the editors of the journal have accepted that this was in error, a retraction has not appeared.

Speight (*op. cit.*) accepted the restoration of *Eristalis* names, also that of *Xanthogramma citrofasciatum* and *Chrysotoxum festivum*, but preferred to use the name *C. fasciatum* for *C. arcuatum*, because of its confused history. It was not mentioned that the confusion resulted from transfer of the name from one species to another by Thompson *et al.* (1982); it was to address this confusion that ICZN became involved. It was appreciated that application of the name *arcuatum* might continue to result in confusion as had been the case since 1982; Iliff and Chandler (*op. cit.*) cited six works published from 1983 to 1996 that had maintained the traditional usage of these names, while those that adopted the changes, at least in part, were sometimes inconsistent in using the name *festivum* in both genera.

It was also pointed out by Iliff and Chandler (*op. cit.*) that *Musca fasciata* Müller, 1764 could not be unequivocally considered even to belong to *Chrysotoxum* and is likely to belong to *Sphaerophoria*; other junior synonyms of *C. arcuatum* exist and might be better candidates, but we preferred to retain *arcuatum* as the name used by most authors for this species, rather than introduce yet another name for the species. Speight (*op. cit.*) referred to the need for revision of the European species of *Chrysotoxum* and that should include any surviving types, but these do not exist for some earlier names including *fasciata*. The confused application of the name *arcuatum* only applies to a small portion of the history of this name and in the references cited by Iliff and Chandler (*op. cit.*) it was nearly always clear which usage the

author concerned was following. As Speight (*op. cit.*) suggested, to ignore ICZN "would be to invite nomenclatural anarchy". This view is taken here but it is considered that acceptance of the decisions of the Commission should be universally applied, as chaos can only result if authors are selective as to which decisions they accept.

Other names used by Speight (2011)

Speight (2011), only available as a pdf from its author, is not a publication in the sense of the Code (ICZN 1999a, clause 8.6), but has been made widely available to European syrphid workers so its nomenclature is likely to be followed and consistency of usage is desirable.

Lapposyrphus and *Megasyrphus* are treated as of generic rank and *Melangyna cincta* (Fallén, 1817) is referred to *Meligramma*. Differences of opinion between authors still exist in these cases. *Chamaesyrphus* is treated as synonymous with *Pelecocera*, following other recent works and this seems likely to gain general acceptance.

The following differences in spelling in Speight (*op. cit.*) from the current British checklist as updated in successive issues of *Dipterists Digest* and other recent literature have also been identified, where the name here considered correct is listed first:

Arctophila bombiformis (Fallén, 1810). The neuter form *bombiforme* is used, but there is no doubt that *Arctophila* is feminine, and there does not appear to be any precedent for treating it as neuter. This species is not British but is found in northern France.

Lejops vittatus (Meigen, 1822). This is treated as feminine (*vittata*). The Code (ICZN 1999a, clause 30.1.4.3) indicates that names ending in –ops are masculine. Chandler (1998b) followed the previous edition of the code, which had the same provision, for all such names.

Meligramma. This is treated as feminine; it was proposed as a subgenus of *Epistrophe* and has been placed as a subgenus of *Melangyna*, both feminine names, so included species have usually been accorded feminine forms for that reason. Names ending in –gramma are neuter (as *Xanthogramma*) and this should be followed when *Meligramma* has generic rank, as in Chandler (1998b); if *cincta* is included it becomes *cinctum*.

Parasyrphus lineola (Zetterstedt, 1843). The masculine form *lineolus* is used, conforming to other species of this genus. However, *lineola* is a noun in apposition (diminutive of linea) so does not change with gender of the genus (Chandler 1998b, p. xiv).

Sphaerophoria philanthus (Meigen, 1822). This has been emended to *philantha* to agree with the feminine gender of the genus, but is latinised Greek that has usually been regarded as a noun in apposition, so should remain as *philanthus*.

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Revision of the West-Palaearctic species of *Pipizella* Rondani, 1856 (Diptera, Syrphidae)

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Summary

The West-Palaearctic species of *Pipizella* are revised. Five new species, *Pipizella ochreobasalis*, *P. vandergooti*, *P. orientalis*, *P. kuznetzovi* and *P. obscura* are described from the West-Palaearctic region. The new species are compared with related species. *Pipizella certa* Violovitsh, stat. rev. is reinstated as valid taxon. Lectotypes are designated for *P. varians* (Rondani) and *P. virens* var. *sacculata* Becker. All known synonyms are given and the following new synonymies are established: *P. campestris* (Fallén) = *P. viduata* (Linnaeus), *P. varians* (Rondani) = *P. maculipennis* (Meigen), *P. macrobasalis* Lucas = *P. calabra* (Goeldlin de Tiefenau), and *P. microapicalis* Lucas = *P. pennina* (Goeldlin de Tiefenau). A key to the males, descriptions and drawings are provided for all species.

Introduction

The Palaearctic genus *Pipizella* Rondani, 1856 consists of about 35 described species (Goeldlin de Tiefenau 1974; Lucas 1976; Šimić 1987; Peck 1988; Kuznetzov 1987a, 1990a, 1990b; Claussen 1991; Kassebeer 1995; Vujić 1997; Claussen and Hayat 1997; Verlinden 1999).

During several years the second author made a good number of collecting trips, many of them to Turkey. Six of the *Pipizella* species found there were not known to him. Four of these species have recently been described by other authors; the other two species are described here. Four additional species, apparently new to science, are also described. These six species are compared with closely related species, and their distinguishing characters are given. For all West-Palaearctic species the main characteristics are provided, as well as a key to the species. Notes on distribution are provided too. Some of the species described by Lucas (1976) are formally synonymised here.

The genus *Pipizella* belongs to the tribe Pipizini, which includes the genera *Triglyphus*, *Trichopsomyia*, *Pipiza*, *Pipizella* and *Heringia* (the last including the subgenera *Heringia* and *Neocnemodon*). The tribe is characterized by a concave face, without central prominence which is covered by long setae; postpronotal lobe with setae; angle between outer cross vein and vein R_{4+5} sharp, not more than 90°; vein r-m ending before the middle of the discal cell; vein R_{4+5} nearly straight; eyes covered with dark and yellow-white setae; body length about 5-10mm; thorax and scutellum black, without any coloured markings; abdomen black, some species with yellow markings. However, the presence of a post-anal hood (not present in *Pipiza*: Thompson 1972), the evenly rounded oral margin, the short and broad (medially shorter than wide) horseshoe shaped clypeus (Hippa and Ståhls 2005) are characteristic for the tribe. The larvae of Pipizini prefer as their prey wax-secreting aphids (i.e. families Thelaxidae, Pemphigidae, Adelgidae) occurring on trees, in galls and under the ground as plant root aphids. The larval mandible is quadrate in shape, a characteristic apparently not shared with other tribes (Rotheray and Gilbert 1989).

The tribe Pipizini has been placed in both the Syrphinae (larval evidence by Rotheray and Gilbert 1989, 1999) and the Eristalinae (adult evidence by Thompson 1969). Kuznetzov

(1988, 1992) regarded Pipizini as a subfamily, based on characters of the egg and first instar larva. Ståhls *et al.* (2003) were the first to combine morphological and molecular characteristics and placed the monophyletic clade of Pipizini basally within the subfamily Syrphinae.

The genus *Pipizella* is characterised by an entirely black abdomen; elongated pedicel; simple legs without modifications (except *P. curvitibia* with the front and mid tibiae club-like: Figs 92, 93); angle between outer cross vein and R_{4+5} about 90°; anterior anepisternum bare; eyes of males holoptic (in some species dichoptic); male abdomen with four and female with five clearly visible segments; cerci compact (except elongate in *P. cantabrica*); paramere round, oval or triangular shaped; aedeagus squarish, upper and lower gonocercus heavily sclerotised. The few known larvae are associated with plant root aphids on umbels e.g. *Pastinaca sativa* (Dixon 1960). The genus *Pipizella* is apparently the only genus in which the sensilla 7 and 8 on the larval abdominal segments 1-7 are fused, or one or the other lost (Rotheray and Gilbert 1989).

In most species only the males can be identified with confidence, by examination of the genitalia. Some males can also be identified on the basis of non-genitalic characters. The length of the eye contiguity of the males ranges between: eyes not touching (Fig. 61), or only touching at one point; very short, ratio of eye contiguity to frons is 1:3.5-6.5; short, ratio eye contiguity to frons 1:2.5-3.5 (Fig. 81); long, ratio eye contiguity to frons 1:2.0-2.5; and very long, ratio eye contiguity to frons 1:1.4-2.0 (Figs 108, 114). The relative length of the postpedicel (length divided by its breadth) ranges between: very short, 1.25-1.5 x (Figs 109, 110, 120); short, 1.5-1.75 x (Figs 62, 124, 127, 132, 153); medium, 1.75-2.5 x (Figs 12, 22, 28, 47, etc.); long, 2.5-3 x (Figs 7, 17, 32, 36, etc), and very long, about 3.5 x (Figs 42, 43). The length of the setae on posterolateral surface of hind tibia (setae length divided by breadth of hind tibia) ranges between: short, less than twice (Figs 8, 13, 23, 37, 102, 161); medium, about twice (Figs 29, 167); and long, more than twice (Fig. 18). The coloration of the metatarsi can be dark, yellow or variable within species. The relative length of tergite IV (length of tergite IV divided by the length of sternite IV can be divided into three groups; short 1.2-1.5; long 1.5-2.0; and 2.0-2.3. On the basis of some of these characters females of some species can also be identified.

Some species possess modifications of sternite III or IV: one long transverse ridge, two round elevations, one single elevation, a longitudinal elevation. The colour of the abdominal setae can be white to yellow, black, or mixed.

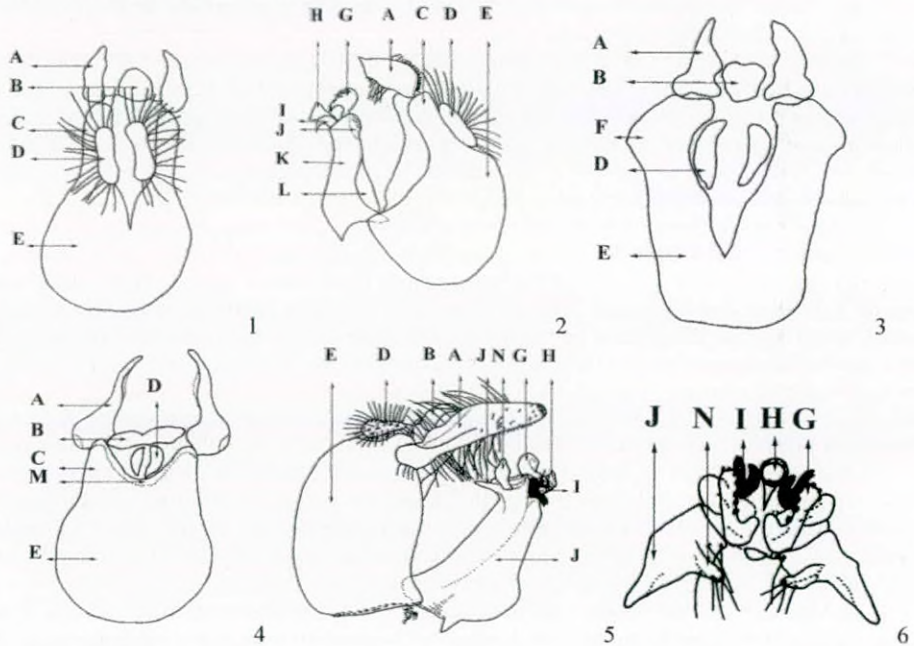
The boundaries of the West-Palaearctic region are not widely accepted. Many regard the Ural mountains as the eastern border. These relatively low mountains do not form an effective border. In Russia the border runs along the Yenisey river, then through Tian Shan, Pamir and Hindu Kush (de Lattin 1967) and going along the northern and western borders of Pakistan down to the southern boundary of the region that lies approximately at the tropic of Cancer. This means that western Siberia, Kazakhstan, and Russian middle Asia are included in the region. Mongolia, China and Pakistan are entirely excluded for this work even if parts of the Tien Shan are within these countries.

Material and methods

The material studied is deposited in the following institutions: Zoölogisch Museum, Amsterdam (ZMA, now in RMNH); Vlaamse Entomologische Vereniging, Antwerpen (VEVA); Museum für Naturkunde, Berlin (MNB); Universitetets Zoologiske Museum, Copenhagen (UZMC); Atatürk University, Erzurum (AUE); Museo Zoologico "La Specola", Florence (MZF); Naturalis, Leiden (RMNH); Zoologiska Museet, Lund (ZML); Institute of

Biology and Ecology, Novi Sad (IBEN); Naturhistoriska Riksmuseet, Stockholm (NRS); Zoological Institute of the Russian Academy of Sciences, St Petersburg (ZIAS); D. Birtele, Natural History Museum of Turin (NHMT); Muséum National d'Histoire Naturelle, Paris (MNHN) ; Institut Agronomique de Gembloux (IAG); Narodni Muzeum v Praze, Prague (NMP); Zoologische Staatssammlung; Munich (ZSM), Zoologisches Forschungsinstitut Alexander Koenig, Bonn (ZFAK) and the private collections of: C. Claussen, Flensburg (CCF); H. Bartsch, Järfälla (HBJ); M. Reemer, Amsterdam (MRA); J.T. Smith, Utrecht (JSU); G. van de Weijer, Reet (GWR); J.A.W. Lucas, Rotterdam (deposited in ZMA); Tore Nielsen, Sandnes (TNS); J. van Steenis, Amersfoort (JSA); W. van Steenis, Breukelen (WSB); A. van Eck, Tilburg (AET); D. Sommaggio, Velo d'Astico (DSV); E. Gilasian, Iran (EGI).

The male genitalia were dissected and boiled in a 10% KOH solution. The drawings were made with the aid of a camera lucida attached to a stereo-microscope. The genitalia were drawn in liquid, the other parts were not treated and drawn in dry state. The terminology of the genitalia is explained in Figs 1-6.



Figs 1-6. 1-2, *Pipizella cantabrica* (Spain): 1, genitalia dorsal view; 2, genitalia lateral view; 3, *Pipizella divicoi* (France), genitalia dorsal view; 4, *Pipizella siciliana* (Italy), genitalia dorsal view; 5-6, *Pipizella ochreobasalis* (paratype, Turkey): 5, genitalia dorsal view: 6, hypandrium, frontal view. A surstylus, B post-anal hood, C epandrial arms, D cercus, E epandrium, F shoulder of epandrium, G upper gonocercus, H aedeagus, I lower gonocercus, J upper process of hypandrium, K hypandrium, L inner median flange of hypandrium, M epandrial rim, N appendage of upper process of hypandrium.

Description of new species

Pipizella kuznetzovi sp. n.

Type material. Holotype ♂: **Turkey:** Turkiye, Hakkari, Suvarihalil pas, W. side, 2300-2400m, 11.viii.1983, leg. J.A.W. Lucas, coll. ZMA.

Paratypes 13♂: **Turkey:** Turkiye, Hakkari, Suvarihalil pas, W. side, 2300-2400m, 11.viii.1983, 1♂, leg. J.A.W. Lucas, coll. JSA; Turkey, Pr. Hakkari, Suvari Halil-Pass, SE Beytisebap, 2300m, 2.viii.1982, 1♂, leg. W. Schacht, coll. ZMA; ibid, 1♂, coll. JSA; prov. Gümüshane, Kop Dagh Geçidi, 2350m, 20.vii.1989, 1♂, leg. J.A.W. Lucas, coll. ZMA; Turkiye, Gümüshane, Köse Dahg Geçidi, 1900m, 21.vii.1989, 3♂, leg. J.A.W. Lucas, coll. ZMA; ibid, 3♂, coll. JSA; prov. Gümüshane, Kop Dagh Geçidi W. side, 2100m, 22.vii.1989, 1♂, leg. J.A.W. Lucas, coll. JSA; prov. Gümüshane, Köse Dagh Geçidi E. side, 1700m, 25.vii.1989, 1♂, leg. J.A.W. Lucas, coll. ZMA; Sorkunlu, Ilica-Erzurum, 1800m, 30.vii.1998, 1♂, leg. R. Hayat, coll. AUE.

Etymology. The species is dedicated to S.Yu. Kuznetzov, who was the first to separate this species from *P. caucasica*.

Diagnosis. Similar to *P. caucasica*. Differs besides genitalia, in the extensively yellow arista, and the extensively yellow legs.

Description. Male. Head: face shiny metallic black with white setae; ratio of width of face and width of head 1:2.7-2.8; frons with setae yellow, some black setae near the lunulae; vertex with yellow and black setae; eyes covered with black setae on upper half and white setae on lower part, 0.09mm long; angle of approximation of the eyes about 90°; ratio of length of eye contiguity and length of frons about 1:2.4-2.9; postpedicel 2.3-2.5 times longer than wide (Fig. 7), arista light-brown to yellow on at least basal 3/4.

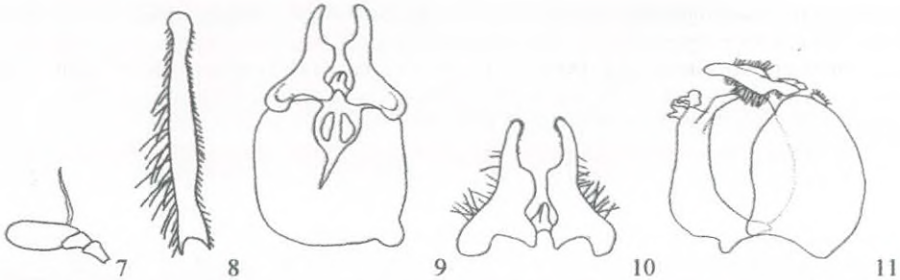
Thorax: mesonotum black, slightly punctated, with yellow setae, about twice as long as setae on face; pleura with yellow setae, distribution of setae as usual in this genus. Wing: covered with microtrichia on 95-100%, with yellow basal veins. Legs: colour black and yellow; femora yellow on apical 1/10-1/5; front and hind tibia yellow on basal 1/4-1/3 and apical 1/10-1/5; mid tibia yellow on basal 1/3-1/2 and apical 1/5; basitarsus of front and mid tarsi yellow, sometimes second tarsomere of mid tarsi yellow; basitarsus of mid tarsi entirely covered with light bristles, cylindrical, 1.8-2.0 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.4-1.7 times as long as the width of the tibia (Fig. 8); setae on femora yellow.

Abdomen: tergum aeneous-black, with erect yellow setae; on medial parts along posterior and anterior margins of tergites II, III and IV patches of short erect black setae; sternites with yellow setae; pregenital segment with yellow setae; tergite II 1.5-1.6 times wider than long, 1.15-1.21 times longer than tergite III, and 0.87-0.90 times longer than tergite IV; tergite IV 1.6-1.7 times longer than sternite IV.

Genitalia (Figs 9-11): epandrium wide without arms; surstylus in dorsal view with wide inner median process with rounded top corner (in *P. elegantissima* even more rounded, in *P. caucasica* with sharp top corner and with parallel margins), in lateral view widest on medial part (in *P. elegantissima* and *P. caucasica* nearly straight throughout); post-anal hood a short tooth with wide base; cerci short oval; hypandrium elongate, widest in basal 1/3 with long hypandrial process (in *P. elegantissima* hypandrial process with a small round appendage at base); upper gonocercus club-like with narrow shaft (in *P. elegantissima* with wide shaft), dentate at base, and wide apex (in *P. elegantissima*, lower gonocercus a small plate with two, more or less symmetrical, processes on either side).

Length: 5.1-7.0mm, wing length: 3.6-4.1mm.

Female. Unknown.



Figs 7-11. ***Pipizella kuznetzovi*** ♂**: 7, left antenna, lateral view (holotype); 8, left hind tibia, dorsal view (paratype, Turkey); 9-11, genitalia (holotype): 9, dorsal view; 10, surstylus, dorsal view; 11, lateral view.**

Pipizella obscura sp. n.

Type material. Holotype ♂: **Sweden**; Lu (Lulelappmark), Granlandet, Malaise (trap in) Forest 8, 6.vi-3.vii.1995, leg. R. Pettersson, coll. NRM.

Paratypes 2♂: **Sweden**; Ångermanland, Örnsköldsvik, Köpmanholmen, Alviken seashore, RN 7009-1640, 7.vii.1999, 1♂, leg. J. & M. van Steenis, coll. JSA; **Finland**; Suomi, PPN, Rovaniemi, 90-195m, 5.vii.1987, 1♂, leg. J.A.W. Lucas, coll. ZMA.

Etymology. The species name reflects the mysterious circumstances under which the first known specimen of this new species has disappeared.

Diagnosis. Similar to *P. viduata*, the only differences being found in the male genitalia.

Description. Male. Head: face shiny metallic black with golden yellow setae; ratio of width of face and width of head 1:2.4; frons with golden yellow setae, some black setae near the lunulae; vertex with golden yellow and black setae; eyes covered with dark setae on upper half and yellow setae on lower part, 0.07mm long; angle of approximation of the eyes about 90°; ratio of length of eye contiguity and length of frons about 1:2.8; postpedicel 2.0 times longer than wide (Fig. 12), arista light-brown.

Thorax: mesonotum black, slightly punctated, with golden yellow setae, about 1.5 times longer than setae on face; pleura with golden yellow setae, distribution of the setae as usual for the species in this genus. Wing: entirely covered with microtrichia. Legs: mainly black, the following parts yellow: basitarsus of mid tarsi, basal 1/4 of front and mid tibia, and basal 1/10 of hind tibia; basitarsus of mid tarsi entirely covered with light bristles, slightly compressed posteriorly, twice as long as second tarsomere; setae on posterolateral surface of hind tibia 1.3 times as long as the width of the tibia (Fig. 13); femora with yellow and black setae; front femur with black setae on apical 1/3, mid and hind femora with black setae on apical 1/10.

Abdomen: tergum aeneous-black, with erect golden yellow setae; on medial parts along posterior and anterior margins of tergites II, III and IV patches of short erect black setae; sternites with yellow setae; pregenital segment with long black and yellow setae; tergite II 1.9 times wider than long, 1.08 times longer than tergite III, and as long as tergite IV; tergite IV 1.7 times longer than sternite IV.

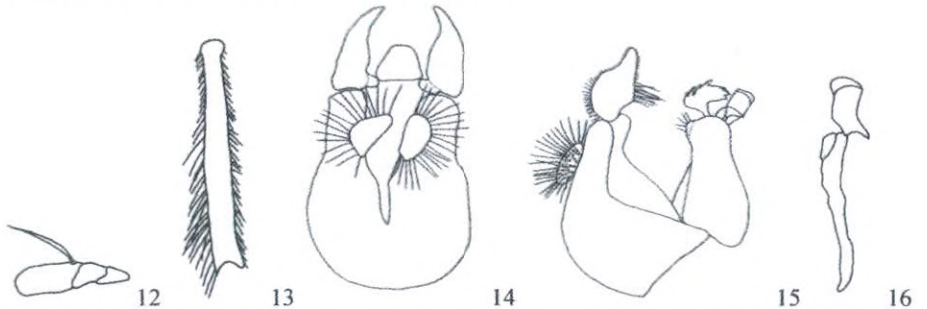
Genitalia (Figs 14-16): epandrium approximately the same size as hypandrium (epandrium relatively smaller than in *P. viduata*), with clearly visible arms; apex of surstylus, in lateral view, more slender than in *P. viduata*; post-anal hood triangular shaped, as in *P.*

viduata; cerci triangular; hypandrium widest at the base (in *P. viduata* wider); inner median flange wide at base, tapering sharply and disappearing before upper hypandrial process; upper gonocercus cockscomb-shaped, irregular (in *P. viduata* more regular), with 7 teeth; lower gonocercus a robust hook.

Length: 5.3-5.5mm, wing length: 3.9-4.0mm.

Female. Unknown.

Discussion. The East-Palaearctic species *P. barkalovi* (Figs 47-50) and *P. nartshukae* (narrow basal part of hypandrium, without inner median flange, upper gonocercus like *P. viduata*) are similar to *P. obscura*. One additional male is known from **Sweden**: Uppland, Uppsala, Sunnersta Åsen SO-slope RN 6631-1604, 6.viii.1996 leg. J. & W. van Steenis. Unfortunately this specimen should be regarded as lost.



Figs 12-16. ***Pipizella obscura*** ♂**: 12, left antenna, lateral view (holotype); 13, left hind tibia, dorsal view (holotype); 14-16, genitalia: 14, dorsal view (paratype, Sweden); 15, lateral view (paratype, Sweden); 16, aedeagus (paratype, Finland).**

Pipizella ochreobasalis sp. n.

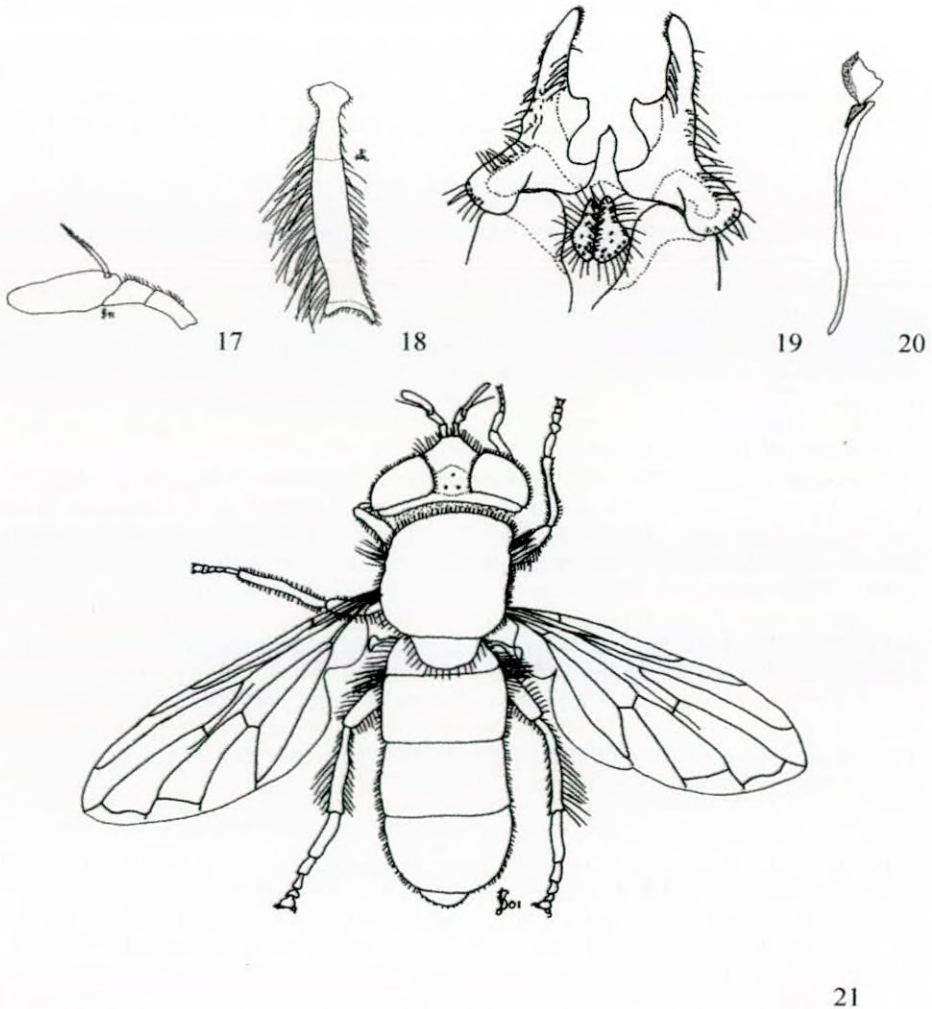
Type material. Holotype ♂: **Turkey**: prov. Hakkári, Sat Daglari, Varegös, 1600-1650m, 17.vi.1984, leg J.A.W. Lucas, coll. ZMA.

Paratypes 7♂, 6♀: **Turkey**: prov. Ağri, 4km NE Cumaçay, 2000m, 8.vii.1986, 1♂, leg J.A.W. Lucas, coll. ZMA; prov. Adiyaman, 10km NE Celikhan, Alti Haral Gölu, 1450m, 1.vii.1986, 1♂, leg. J.A.W. Lucas, coll. ZMA; ibid, 1♂, 1♀, coll. JSA; prov. Ankara, S of Ankara, 24.vi.1984, 1♀, leg. J.A.W. Lucas, coll. ZMA; ibid, 1♂, coll. JSA; prov. Hakkári, Sat Daglari, Varegös, 1600m, 15.vi.1984, 1♂, leg. J.A.W. Lucas, coll. JSA; ibid 1600-1650m, 17.vi.1984, 2♀, leg. J.A.W. Lucas, coll. ZMA; prov. Hakkári, Chilo Daglari, N of Oramar, 1400m, 16.vi.1984, 1♂, leg. J.A.W. Lucas, coll. JSA; prov. Hakkári, S Varegös/Mt. Sat, 1800m, 17.vi.1984, 1♀, leg. Warncke, coll. JSA; prov. Hakkári, Tanin-Tanin Pass, 2200m, 25.vi.1985, 1♀, leg. C.J. Zwakhals, coll. ZMA; **Iran**: Rd Chiraz [Shiraz] Kazeroun [Kazeron], Fort Sine-Sefid, 23.iv.1937, [29°35'N 52°E], 1 ♂, ex coll. F.H. Brandt, coll. VEVA.

Etymology. The species name is derived from the remarkably yellow wing bases in both the male and the female.

Diagnosis. Similar to *P. caucasica* Skufjin, 1976. Apart from the differences in genitalia *P. ochreobasalis* is more robust, the pedicel is more elongate (Fig. 17), wing base clearly yellow, hind tibia with longer setae (Fig. 18), and basitarsus of hind tarsi longer and tapering towards apex.

Description. Male. Head: face shiny metallic black with dense and long white setae; ratio of width of face and width of head 1:2.4-2.5; frons with long white setae, black setae on the lunulae about half as long as setae on frons; vertex with long light yellow setae; eyes covered with white setae (0.12mm), about 1/3 of the length of the facial setae; angle of approximation of eyes about 90°; ratio of length of eye contiguity and length of the frons 1:2.0-2.3; postpedicel 2.6-2.9 times longer than wide (Fig. 17), arista yellow-brown, distal 1/3 dark.



Figs 17-21. ***Pipizella ochreobasalis*****; 17, left antenna, lateral view (holotype ♂); 18, left hind tibia, dorsal view (holotype ♂); 19-20, genitalia (paratype ♂, Turkey): 19, apical part of epandrium, dorsal view; 20, aedeagus, lateral view; 21, habitus (paratype ♀).**

Thorax: mesonotum black, densely and coarsely punctated, with long light yellow setae, about 1.75 times longer than facial setae; pleura with long light yellow setae, distribution of the setae as usual for this genus. Wing: hyaline, veins in basal 1/4 clearly yellow; covered with microtrichia except for the basal part of second costal cell. Legs: mainly black; femora with apical 1/7 yellow; all tibiae yellow on apical 1/10, and front tibia on basal 3/7, mid tibia on basal half, hind tibia on basal quarter; basitarsus of front and mid tarsi and sometimes second tarsomere of mid tarsi yellow; hind tarsi ventral side dark yellow, basitarsus slightly wider than tibia and tapering towards apex; basitarsus of mid tarsi entirely covered with short yellow bristles, cylindrical, 1.7-1.9 times longer than second tarsomere; setae on legs yellow and long; setae on posterolateral surface of hind tibia 1.9-2.4 times as long as the width of the tibia (Fig. 18).

Abdomen: tergum aeneous-black, densely and coarsely punctated, with erect light golden-yellow setae; on medial parts along posterior margins of tergites II and III and anterior margin of tergite IV patches of short erect black setae, sometimes extended over the whole tergite; sternites with long light-yellow setae; pregenital segment with golden-yellow setae; tergite II 1.7 times wider than long, 1.07-1.11 times longer than tergite III, and 0.77-0.84 times longer than tergite IV; tergite IV 1.6-1.8 times longer than sternite IV.

Genitalia (Figs 5, 6, 19, and 20): epandrium voluminous, without arms; post-anal hood clearly visible in lateral view; surstylus in dorsal view with wide inner median process with a sharp top corner; hypandrium long and wide, with very wide apex; upper hypandrial process robust with a large appendage (upper hypandrial appendage); upper gonocercus club-like with wide apex and dentate base of the shaft; lower gonocercus a small plate with two long and wide, bifid processes on either side.

Length: 6.3-7.9mm, wing length: 4.4-5.6mm.

Female (Fig. 21). Similar to male except for the usual sexual dimorphism. Setae less long and darker, especially on the thorax. Head: ratio of width of face over the lunula, respectively over ocelli and width of head 1:2.2 and 1:4.4; frons with small triangular pollinose areas along the eye margin; postpedicel 2.9 times longer than wide, arista entirely yellow. Wing: infuscated, veins on basal 3/7 yellow; cell BM sometimes with a small bare area near the base. Legs: more yellow than in the male; all tibiae yellow on apical 1/10, front and mid tibiae on basal half, and hind tibia on basal third; front and mid tarsi with yellow basitarsus and second tarsomere; basitarsus of mid tarsi cylindrical, 1.9 times longer than second tarsomere; setae on the legs about as long as in the male; setae on posterolateral surface of hind tibia 1.9 times as long as the width of the tibia; tergite II 1.9 times wider than long, 1.03 times longer than tergite III, and 0.87 times longer than tergite IV.

Length: 7.9-9.4mm, wing length: 5.3-6.3mm.

Pipizella orientalis sp. n.

Type material. Holotype ♂: **Turkey**: Erzurum, Erzurum (Kayak), Palandöken Dagl., 2200-2300m, 11.vii.1986, leg. J.A.W. Lucas, coll. ZMA.

Paratypes 32♂: **Turkey**: prov. Afyon, Sultandaglari, 10km S of Cay, 1200m, 29.vii.1981, 1♂, leg. H. Coene, J. Lucas & B. v. Oorschot, coll. ZMA; ibid, 2♂, coll. JSA; ibid 2.viii.1981 1♂, coll. ZMA; ibid, 1♂, coll. JSA; prov. Erzurum, Pas Ikizdere-Ispir S. side, 1750-1800m, 31.vii.1983, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Kars, Handre, 20km W of Sarikamiş, 2100-2200m, 1.viii.1983, 1♂, leg. J.A.W. Lucas, coll. JSA; prov. Kars, 25km W Sarikamiş, 2100m, 6.vii.1985, 1♂, leg. C.J. Zwakhals, coll. ZMA; prov. Erzurum, Erzurum (Kayak), Palandöken Dagl., 2200-2300m, 11.vii.1986, 3♂, leg. J.A.W. Lucas, coll. ZMA; ibid, 6♂, coll. JSA; prov Rize, Ovit pass S. side, 2400m, 16.vii.1986, 1♂, leg. J.A.W. Lucas, coll.

ZMA; prov. Gümüshane, Kop. Dagh Geçidi W. side, 2100m, 22.vii.1989, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Erzurum, Ovit Geçidi S. side, 1900m, 18.vii.1989, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Erzurum, Ovit Geçidi S. side, 2km W Cayirozü, 1900m, 17.vii.1992, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Bayburt, Kop Dagl. Geçidi, 2300m, 16.vii.1992, 1♂, leg. J.A.W. Lucas, coll. ZMA; Erzurum, Karagöbek Dgl, 2200m, 5.vii.1989, 1♂, leg H. Özbek, coll. AUE; Erzurum, Palandöken, 17.vii.1988, 1♂, leg. R. Hayat, coll. AUE; Erzurum, Palandöken, 9.vii.1986, 1♂, leg. S. Firat, coll. AUE; Erzurum, Ilica, Atlikonak, 8.vii.1997, 1♂, leg. Ö. Çalmaşur, coll. AUE; Erzurum, Tortum, 2.vii.2000, 1♂, leg. Ö.Çalmaşur, coll. CCF; Erzurum, Rabat-Pasinler, 2400m, 10.vii.1997, 1♂, leg. E. Kiliç, coll. AUE; Erzurum, Öltu, Çamlibel, 2.vii.1997, 1♂, leg. E. Yilduim, coll. AUE; Erzurum, Ilica, Sorkunlu, 1800m, 30.vii.1998, 1♂, leg. R. Hayat, coll. AUE; Erzurum, Ilica, Rizekent, 2200m, 30.vii.1998, DNA voucher specimen No. S 348 G. Ståhls, FMNH, 1♂, leg. R. Hayat, coll. AUE; **Georgia**: Transcaucasus, Bakuriani, 17.vii.1986, 1♂, leg. S. Kuznetzov, coll. ZMA.

Etymology. The species name is derived from the eastern distribution of this species within the West-Palaearctic region, referring to the Orient.

Diagnosis. Similar to *P. annulata*. Besides the differences in genitalia *P. orientalis* has slightly longer and darker setae on face, eyes and mesonotum. Legs less yellow in *P. orientalis*. Basal wing veins yellow in *P. orientalis*.

Description. Male. Head: face shiny metallic black with yellow setae; ratio of width of face and width of head 1:2.6-2.8; frons with yellow setae, some black setae near lunulae; vertex with light- and dark-yellow setae; eyes covered with black and white setae, 0.10mm and about a third length of the setae on face; angle of approximation of the eyes about 90°; ratio of length of eye contiguity and length of the frons 1:2.4-2.9; postpedicel 2.4-2.8 times longer than wide (Fig. 22), arista light at basal half.

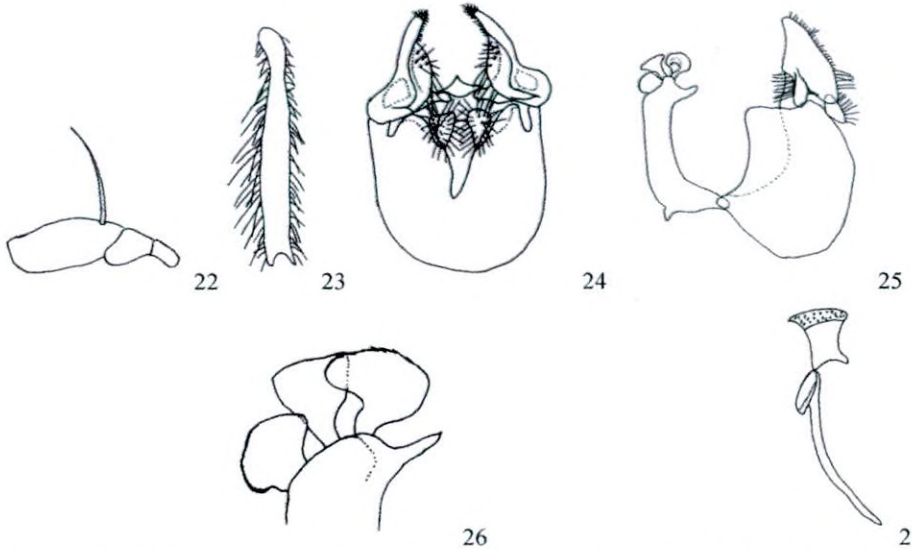
Thorax: mesonotum black, slightly punctated, with yellow setae, about twice as long as setae on face; pleura with long yellow setae, distribution of setae as usual for genus. Wing: entirely covered with microtrichia; basal veins yellow. Legs: with yellow and black colour; femora yellow on apical 1/10; front tibia yellow on basal 1/4-2/5 and apical 1/5; mid tibia with yellow on basal 2/5-1/2 and apical 1/5; mid tibia yellow on basal 1/5 and apical 1/10; basitarsus of front and mid tarsi, and sometimes second tarsomere of mid tarsi yellow; basitarsus of mid tarsi entirely covered with yellow bristles, compressed posteriorly, 2.0-2.2 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.5-1.7 times longer than tibial width (Fig. 23); setae on femora yellow.

Abdomen: tergum aeneous-black, with black and yellow setae; sternites with light-yellow setae; pregenital segment with white setae; tergite II 1.5-1.6 times wider than long, 1.15-1.22 times longer than tergite III, and 0.93-1.00 times longer than tergite IV; tergite IV 1.7-1.8 times longer than sternite IV.

Genitalia (Figs 24-27) similar to *P. annulata*; epandrium very wide, upper medial corner angled; surstylus wide in dorsal view, less elongate than in *P. annulata*; cerci triangular; hypandrium narrow with long hypandrial process and long (in *P. annulata* short) more or less horizontal base; upper gonocercus a round plate with serrated dorsal margin; aedeagus robust, with ventrolateral process; lower gonocercus square and serrated on dorsal and lateral sides, in *P. annulata* more rectangular and with less obviously serrated dorsal margin.

Length 5.4-6.9mm, wing length 3.5–4.4mm.

Female. Unknown.



Figs 22-27. ***Pipizella orientalis*** ♂**: 22, left antenna, lateral view (holotype); 23, left hind tibia, dorsal view (paratype, Turkey); 24-27: genitalia: 24, dorsal view (holotype); 25, lateral view (paratype, Russia); 26, apical part of hypandrium, lateral view (paratype, Turkey); 27, aedeagus, lateral view (paratype, Turkey).**

Pipizella vandergooti sp. n.

Type material. Holotype ♂: **Turkey**; prov. Erzurum, Ovit Geçidi S. side, 2km W Cayirozü, 1900m, 18.vii.1992, leg. J.A.W. Lucas, coll. ZMA.

Etymology. This species is dedicated to the late Volkert S. van der Goot in honour of his major contribution to the study of Syrphidae.

Diagnosis. Similar to *P. viduata.* Besides the differences in genitalia *P. vandergooti* has all setae light yellow and long (much longer than in *P. viduata*), with only some short black setae on frons and abdomen. Legs black, only knees yellow. In *P. viduata* the legs are more yellow, but variable.

Description. Male. Head: face shiny metallic black with long light yellow setae; ratio of width of face and width of head 1:2.6; frons with long black setae on anterior half, rest with yellow setae; vertex with light yellow setae; eyes covered with dark setae (0.11mm), about 1/3 of the length of the setae on face; angle of approximation of the eyes about 90°; ratio of length of eye contiguity and length of the frons 1:2.9; postpedicel 2.0 times longer than wide (Fig. 28, arista dark-brown.

Thorax: mesonotum black, slightly punctated, with long light yellow setae, about twice as long as setae on face; pleura with long light yellow setae, distribution of setae as usual in genus. Wing: entirely covered with microtrichia. Legs: black, only knees yellow; basitarsus of mid tarsi entirely covered with light short bristles, cylindrical, 1.8 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.8 times as long as the width of the tibia (Fig. 29); setae on femora yellow with black setae on apical quarter of front femur, and some black setae on apical 1/10 of mid and hind femur.

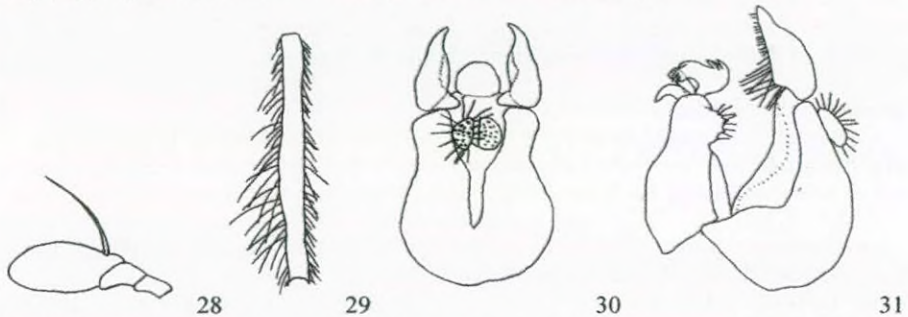
Abdomen: tergum aeneous-black, with erect light yellow setae; on medial parts along posterior margins of tergites II and III and anterior margin of tergite IV patches of short erect black setae; sternites with light yellow setae; pregenital segment with white setae; tergite II 1.5 times wider than long, 1.12 times longer than tergite III, and 1.05 times longer than tergite IV; tergite IV 1.7 times longer than sternite IV.

Genitalia (Figs 30, 31): epandrium approximately the same size as hypandrium (in *P. viduata* epandrium relatively larger), with clearly visible arms; surstylus relatively longer than in *P. viduata*; post-anal hood a course punctated circle (in *P. viduata* more triangular); hypandrium straight, slightly widened at the basis (in *P. viduata* with wider base); inner median flange wide at basis and tapering towards apex (in *P. viduata* widest in median part, not disappearing before apical process); upper gonocercus irregular (in *P. viduata* more regular shaped), with seven teeth; lower gonocercus with robust hook form.

Length: 5.8mm, wing length: 4.2mm.

Female. Unknown.

Discussion. The East-Siberian species *P. barkalovi* Violovitsh, 1981 (Figs 47-50) and *P. nartshukae* Kuznetzov, 1990b (post-anal hood more triangular, without inner median flange, upper gonocercus like *P. viduata*) are similar to *P. vandergooti*.



Figs 28-31. ***Pipizella vandergooti*** **♂ (holotype, Turkey): 28, left antenna, lateral view; 29, left hind tibia, dorsal view; 30-31, genitalia: 30, dorsal view; 31, lateral view.**

Species accounts

Pipizella altaica Violovitsh, 1981: 64.

Pipizella adentata Violovitsh, 1981: 74 (syn. Kuznetzov 1990b).

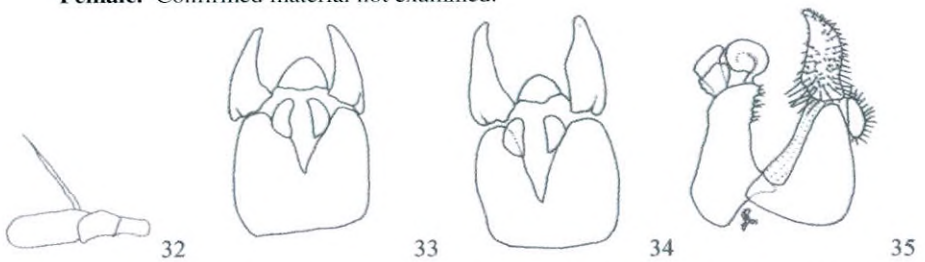
Type material. The following paratypes of *P. altaica* were studied by the first author: **Russia**: Altai (Алтай) Телецкое озеро (пос.) Артыбаш, 25.vi.1974, 1 ♂, leg. N. Violovitsh, coll. TNS; ibid, 3.vii.1974, 1 ♂, coll. JSA; ibid, 1♂, coll. ZIAS.

Other material. No other material was studied.

Description. Male. Head: ratio of width of face and width of head 1:2.6-2.7; ratio length of eye contiguity with length of frons 1:2.5-2.8; setae on eyes black and white, 0.07mm; postpedicel 2.3-2.7 times longer than wide (Fig. 32), arista dark, with light base. Wing: entirely covered with microtrichia. Legs: black and yellow; yellow on apical 1/15 of femora, front tibia basal quarter and apical 1/10, mid tibia basal third and apical 1/10, hind tibia on basal 1/5, basitarsus of front and mid tarsi; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.6-1.8 times longer than second tarsomere; setae on femora yellow; setae on posterolateral surface of hind tibia 1.3-1.5 times longer than tibial width. Abdomen: setae black and yellow, pregenital segment with yellow setae; tergite II 1.4-1.5

times wider than long, 1.06-1.10 times longer than tergite III, and 0.97-1.13 times longer than tergite IV; tergite IV 1.5-1.6 times longer than sternite IV. Genitalia (Figs 33-35): epandrium squarish, as long as surstylus; surstylus in ventral view, tapering gradually towards narrow apex, in dorsal view triangular gradually tapering towards narrow apex; upper gonocercus circular with small dents near dorsolateral margin; lower gonocercus squarish with small dents along lateral margin; hypandrium with dents and setae along upper inner margin; post-anal hood triangular. Length 6.5-6.7mm, wing length 4.5-4.8mm.

Female. Confirmed material not examined.



Figs 32-35. ***Pipizella altaica*** ♂ **(paratypes, Russia): 32, left antenna, lateral view; 33-35, genitalia: 33, dorsal view; 34, dorsal view; 35, lateral view.**

Pipizella annulata (Macquart, 1829: 181).

Heringia flavescens Goeldlin de Tiefenau, 1974: 238 (syn. Maibach *et al.* 1992).

Type material. The neotype of *P. annulata* was studied by the second author: Garmisch Partenkirchen (Germany, Bavaria), 800m, 16.vii.1969, leg. J.A.W. Lucas and Neotype des. J.A.W. Lucas, coll. ZMA. One male paratype of *Heringia flavescens* was studied by the first author: Paratypus, Suisse, Valais, 24.vi.1968 Van d'en Haut, leg. P. Goeldlin, *Pipizella flavescens* (Goeldl.) dét P. Goeldlin 197? in coll. TNS.

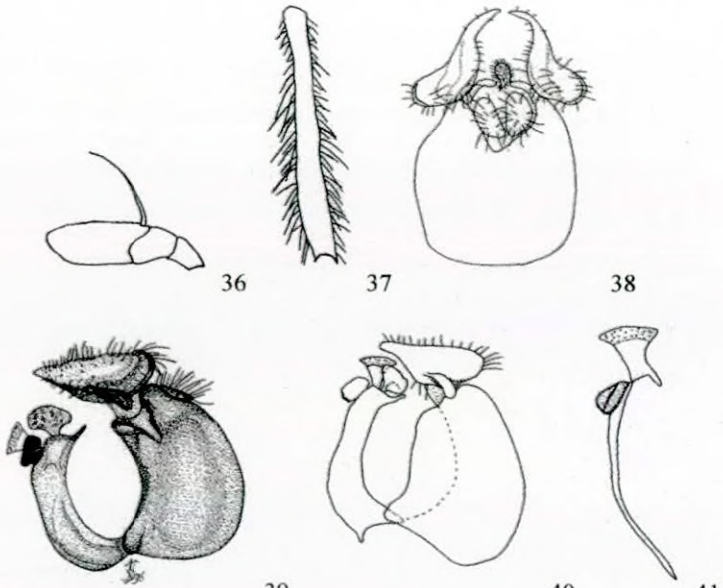
Other material. Specimens studied from Austria, Belgium, France, Germany, Hungary, Italy, Croatia, Liechtenstein, The Netherlands, Portugal, Spain, and Switzerland; Italy, prov Aosta, 1500m, Chentere, 8.vii.1999, 1♂, leg. & coll. G. v/d Weyer, DNA Voucher specimen No S 343, G. Ståhls, FMNH.

Description. Male. Head: ratio of width of face and width of head 1:2.5-2.6; ratio of length of eye contiguity and length of the frons 1:2.3-2.7; eyes with dark and white setae, 0.09mm long; postpedicel 2.4-2.9 times longer than wide (Fig. 36), arista light on basal quarter. Wing: entirely covered with microtrichia, sometimes very sparse at base of second basal cell. Legs: black and yellow; front leg yellow on apical 1/10 of femur, basal 1/3 and apical 1/6 of tibia, basitarsus and sometimes fifth tarsomere; mid leg yellow on apical 1/10 of femur, basal half and apical 1/6 of tibia, and basitarsus and sometimes second tarsomere; hind tibia yellow on basal 1/10-1/5 and apical 1/10 or less; basitarsus of mid tarsi entirely covered with yellow bristles, compressed posteriorly, 2.0-2.1 times longer than second tarsomere; setae on femora yellow; setae on posterolateral surface of hind tibia 1.3-1.5 times longer than tibial width (Fig. 37). Abdomen: with black and white setae, sternite VII (pregenital segment) with white setae; tergite II 1.5-1.8 times wider than long, 1.17-1.21 times longer than tergite III, and 0.95-1.17 times longer than tergite IV; tergite IV 1.7-1.8 times longer than sternite IV. Genitalia (Figs 38-41) similar to *P. orientalis*; *P. annulata* with narrower epandrium, without sharp angle at upper medial corner; cerci irregularly triangular shaped; hypandrium with short horizontal base and less robust apical process; aedeagus more elongate with sharper and more

vertical ventrolateral process; lower gonocercus more rectangular and with less obviously serrated dorsal margin. Length 5.6-8.3mm, wing length 4.2-5.0mm.

Female. Confirmed material not examined.

Discussion. We have been unable to find material of this species from Turkey, where *P. orientalis* is not uncommon. It therefore seems reasonable that the material from Turkey reported by Hayat and Alaoğlu (1990) and Claussen and Hayat (1997) in fact belongs to *P. orientalis*. For records from Finland see under *P. certa*.



Figs 36-41. ***Pipizella annulata*** **♂: 36, left antenna, lateral view (Italy); 37, left hind tibia, dorsal view (Italy); 38-41, genitalia: 38, dorsal view (France); 39, lateral view (France); 40, lateral view (Italy); 41, aedeagus, lateral view (Italy).**

Pipizella antennata Violovitsh, 1981: 65.

Type material. One male paratype was studied by the first author: **Russia**: Юж. Приморье (South Primorje), оз. Хасан, 3.viii.1978, leg. А. Баркалов, coll. TNS.

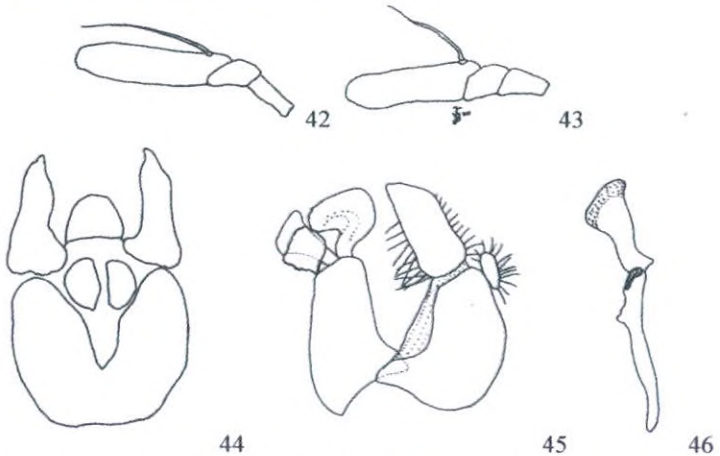
Other material. Russia: South Primorje, Seifoon, 14.viii.1985, 1♀, leg. S. Kuznetzov, coll. ZMA; **Turkey**: prov. Afyon, Sultandaglari, 15km S of Cay, 1400m, 1.viii.1981, 1♀, leg. H. Coene, J. Lucas & B. v. Oorschot, coll. ZMA.

Description. Male. Head: ratio of width of face and width of head 1:2.8; ratio of length of eye contiguity and length of the frons 1:3.0; eyes with short (0.04mm) yellow and dark setae; postpedicel 3.7 times longer than wide (Fig. 42), arista yellow on basal 2/3. Wing: entirely covered with microtrichia. Legs: extensively yellow, other parts black; femora yellow on apical 1/10; front and mid tibia yellow on basal 1/3 and apical 1/10; front and mid tarsi with yellow basitarsus and second tarsomere; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 2.0 times longer than second tarsomere; setae on femora yellow; setae on posterolateral surface of hind tibia 1.8 times longer than tibial width.

Abdomen: with black and yellow setae, pregenital segment with yellow setae; tergite II 1.6 times wider than long, 1.14 times longer than tergite III, and 1.10 times longer than tergite IV; tergite IV 1.7 times longer than sternite IV. Genitalia (Figs 44-46) similar to *P. altaica*; epandrium more circular; surstylus, in ventral view, tapering from apical 3/4 towards narrow apex, in dorsal view with wide base, curved inner outline and narrow apex; lower gonocercus with dents along lateral and dorsal margin; hypandrium without dents. Length 6.1mm, wing length 4.6mm.

Female. Head: postpedicel 3.5 times longer than wide (Fig. 43); arista yellow on basal 2/3 or entirely yellow. Legs: front and mid femur yellow on apical 1/5; front and mid tibia yellow on basal 2/5 and apical ¼; hind tibia yellow on basal ¼; basitarsus and fifth tarsomere of front tarsi yellow; mid tarsi entirely yellow, third and fourth tarsomeres darkened; hind tarsi with yellow basitarsus and second tarsomere. Length 5.4 and 7.6mm.

Discussion. The female from Russia is large and wide, the female from Turkey small and narrow. The status of the Turkish specimen is therefore unclear, but it belongs certainly to a different species than all other species dealt with here.



Figs 42-46. ***Pipizella antennata*: 42, left antenna, lateral view (paratype ♂, Russia); 43, left antenna, lateral view ♀ (Turkey); 44-46, genitalia (paratype, Russia): 44, dorsal view; 45, lateral view; 46, aedeagus.**

Pipizella barkalovi Violovitsh, 1981: 68.

Type material. The following paratypes were studied by the first author: **Russia**: Юж. Приморье (South Primorje), оз. Хасан, 1.viii.1978, 1♂, leg. А. Баркалов, coll. TNS; ibid 3.viii.1978, 1♂, coll. TNS; ibid, 1♂, coll. JSA.

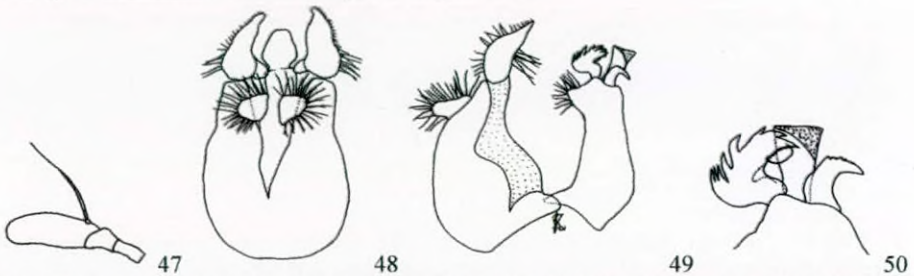
Other material. No other material was studied.

Description. Male. Head: ratio of width of face and width of head 1:2.5-2.7; setae on frons white, some black setae near lunulae; ratio of length of eye contiguity and length of frons 1:1.7-1.9; setae on eyes 0.07mm long dark on dorsal half and white on ventral half; postpedicel 2.0-2.4 times longer than wide (Fig. 47), arista light on basal half. Wing: entirely covered in microtrichia. Legs: black, the following parts yellow: knees, basal 1/4-1/3 and apical 1/20 of front tibia, basal 1/3-1/2 and apical 1/15 of mid tibia, basal 1/10 of hind tibia, basitarsus of front and mid tarsi, sometimes basitarsus of front tarsi darkened; basitarsus of

mid tarsi entirely covered with yellow bristles, compressed posteriorly, 2.0-2.1 times longer than second tarsomere; setae on femora yellow, some black setae present on apical part of front and mid femur; setae on posterolateral surface of hind tibia 1.6-1.8 times longer than tibial width. Abdomen: tergite II with long white setae, a band of black setae along posterior margin; tergites III and IV with mixed white and black setae; pregenital segment with white setae; tergite II 1.6-1.7 times wider than long, 1.07-1.12 times longer than tergite III and IV; tergite IV 1.8-2.0 times longer than sternite IV. Genitalia (Figs 48-50) similar to *P. viduata*; epandrium smaller, with very short arms; cercus and surstylus less elongate; post-anal hood large triangular; hypandrium without inner median flange; base of hypandrium less wide; hypandrial process sharper; upper gonocercus with three small teeth followed by four larger lobes, and medially with a small lobe, but this lobe could be aberrant as it was only readily visible in one male; lower gonocercus a wide hook with a few small dents dorsally. Length 6.5-6.7mm, wing length 4.7-4.9mm.

Female. Confirmed material not examined.

Discussion. Due to the resemblance with other species close to *P. viduata* a short description of this east Palaearctic species is given here.



Figs 47-50. ***Pipizella barkalovi*** **(paratype, Russia): 47, left antenna, lateral view; 48-50, genitalia: 48, dorsal view; 49, lateral view; 50, apical part of hypandrium, lateral view.**

Pipizella bayburtica Claussen & Hayat, 1997: 448.

Type material. One paratype was studied by the first author: **Turkey**: Demirözü Bayburt 30.vii.1991, 1♂, leg. H. Bostan, coll. CCF.

Other material. Turkey: prov. Hakkári, Suvari Halil-Pass, SE Beytisebap, 2300m, 2.viii.1982, 2♂, leg. W. Schacht, coll. ZMA; prov. Hakkári, Gavaruk-See/Mt Sat, 2900m, 5.viii.1983, 2♂, leg. Warncke, coll. ZMA; prov. Hakkári, Sat-Geb. nördl. Mt. Gavaruk, 2900m, 7.viii.1983, 2♂, leg. Warncke, coll. ZMA; prov. Hakkári, Suvarihalil pas W. side, 2300-2400m, 11.viii.1983, 2♂ leg. J.A.W. Lucas, coll. ZMA; prov. Hakkári, Tanin-Tanin pas, 2200m, 12.vi.1984, 2♂, leg. J.A.W. Lucas, coll. ZMA; Hakkári, Suvarihalil pas, 2500-2600m, 14.vi.1984, 2♂ leg. J.A.W. Lucas, coll. ZMA; ibid, 1♂, coll. JSA; ibid, 27.vi.1985, 2♂, leg. C.J. Zwakhals, coll. ZMA, ibid, 1 ♂, coll. JSA; Bayburt, Kop dagl Geçidi, 2300m, 16.vii.1992, 3♂, leg. J.A.W. Lucas, coll. ZMA; Erzurum, 16km NW Ispir, 1500m, 18.vii.1992, 1♂, leg. J.A.W. Lucas, coll. ZMA; Erzurum, 2km W Cayirazu, Ovit Geçidi S. side, 1900m, 18.vii.1992, 1♂, leg. J.A.W. Lucas, coll. ZMA.

Description. Male. Head: ratio of width of face and width of head 1:2.5-2.6; ratio of length of eye contiguity and length of the frons 1:2.4-3.1 (4.3); setae on eyes 0.07mm, dark on dorsal half and white on ventral half; postpedicel 2.2-2.6 times longer than wide (Fig. 51); arista yellow on basal 2/3. Wing: first basal cell covered for 95% with microtrichia. Legs: black, following parts yellow: apical 1/10 of femora, basal 2/5 and apical 1/6 of front tibia,

basal 1/2 and apical 1/5 of mid tibia, basal 1/4 of hind tibia, basitarsus and fifth tarsomere of front and mid tarsi, sometimes second tarsomere of mid tarsi, and fifth tarsomere of hind tarsi; basitarsus of mid tarsi without yellow bristles in posterior compression, 1.8-2.0 times longer than second tarsomere; setae on femora yellow; setae on posterolateral surface of hind tibia 1.7-1.9 times longer than tibial width. Abdomen: with black and yellow setae, pregenital segment with yellow setae; tergite II 1.4-1.6 times wider than long, 1.11-1.20 times longer than tergite III and 0.97-1.07 times longer than tergite IV; tergite IV 1.1-1.4 times longer than sternite IV. Genitalia (Figs 52-54) similar to *P. zeneggenensis*; post-anal hood flat, hardly visible in dorsal view; upper gonocercus sickle-shaped, finely dentate on outer margin. Lower gonocercus squarish with serrate apical margin; in *P. zeneggenensis* the post-anal hood is kidney-shaped, upper gonocercus a cockscomb without teeth, and lower gonocercus an oval dentate plate. Length 5.2-7.2mm, wing length 3.9-4.8mm.

Female. Very similar to male. Front and mid tarsi completely yellow. Wing base with yellow veins.

Figs 51-54. ***Pipizella bayburtica*** ♂ **(Turkey): 51, left antenna, lateral view; 52-54, genitalia: 52, dorsal view; 53, lateral view; 54, aedeagus, lateral view.**

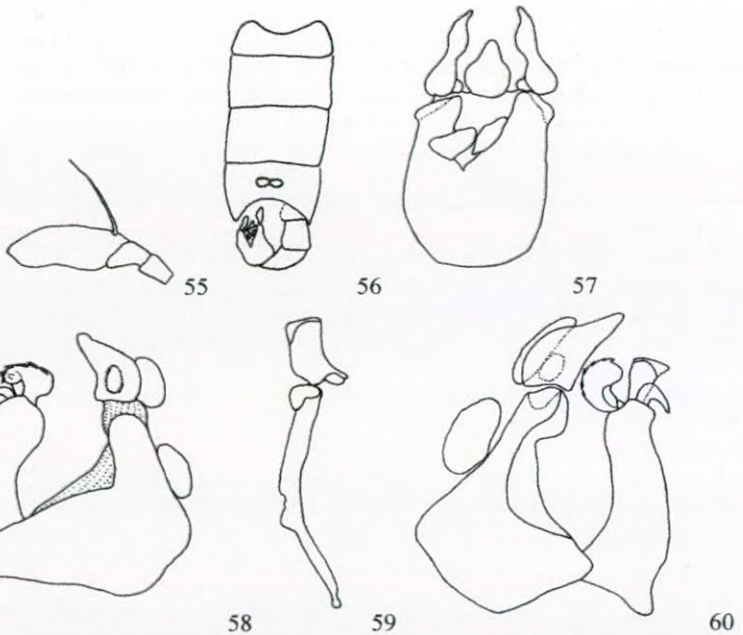
Pipizella bispina Šimić, 1987: 119.

Type material. No type material was studied.

Other material. Austria: Kärnten, Bodental, 1000m, 5.vii.1981, 2♂ 1♀, leg. C.J. Zwakhals, coll. ZMA; Kärnten, Loibelpas, juli 1981, 1♂ 1♀, leg. W. Maassen, coll. ZMA; ibid, Obergottesfeld, 1♂, leg. W. Maassen, coll. ZMA; **Italy**: Bologna, Castiglione dei Pepoli (nr Rif. Abetaia), 900m, 2.vii.1985, 1♂, leg. J.A.W. Lucas, coll. ZMA; **Spain**: España, Puigcerda, Catalunya, Pyrenees, Cerdanya, 1200m, 13.vii.1996, 1♀, leg. & coll. J.T. Smit; España, La Molina, Catalunya, Pyrenees, Cerdanya, 1500m, 20.vii.1996, 1♂, leg. & coll. J.T. Smit; **Montenegro**: H-613, 066 Durmitor, Tara-Splaviste, 22.vi.1985, 1♂, (genitalia glued on separate glass slide with the number "H-613" and "bispina"), coll. IBEN; Prokletije, Krosnje, 28.vii.1994, 1♂, leg Vujić, coll. IBEN.

Description. Male. Head: ratio of width of face and width of head 1:2.5; ratio of length of eye contiguity and length of the frons 1:1.7-1.9; setae on eyes brown to dark brown, 0.09mm long; postpedicel 2.2-2.5 times longer than wide (Fig. 55), arista yellow on basal half. Wing: entirely covered with microtrichia. Legs: colour as in *P. pennina*, yellow on basal 1/4 of front and mid tibia and sometimes basitarsus of front and mid tarsi; basitarsus of mid tarsi entirely covered with light bristles, cylindrical, 1.9-2.0 times longer than second tarsomere; setae on front femur black on apical half, on mid femur black on apical 1/3, other femoral setae yellow; setae on posterolateral surface of hind tibia 1.6-1.8 times longer than tibial width. Abdomen: setae on tergite II predominantly white with a narrow band of black

setae along posterior margin, setae on tergites III and IV predominantly black; sternite VIII with black setae, sometimes with some white setae intermingled; tergite II 1.5-1.7 times wider than long, 1.19-1.22 times longer than tergite III, 1.12-1.15 times longer than tergite IV; tergite IV 1.7-1.8 times longer than sternite IV; sternite IV medially with a single sharp elevation with small bristles (Fig. 56). Genitalia (Figs 57-60): epandrium, in lateral view, with very wide base and narrow apex and in dorsal view with shoulders; post-anal hood pear-shaped; hypandrium straight; upper gonocercus cocks-comb like with seven teeth. Lower gonocercus hook shaped. Length 6.2-8.1mm, wing length 4.5-5.9mm.



Figs 55-60. ***Pipizella bispina*** ♂**: 55, left antenna, lateral view (Austria); 56, sternites (Italy); 57-59, genitalia (Austria): 57, dorsal view; 58, lateral view; 59, aedeagus; 60, genitalia (holotype), lateral view.**

Female. Head: ratio of width of face over the lunula respectively over ocelli and width of head 1: 2.6-2.8 and 1:4.1-4.2; frons with small triangular pollinose areas along the eye margin; postpedicel 2.3-2.5 times longer than wide, arista yellow on basal 1/4. Wing: infuscated; cell BM covered over (50) 80-90% with microtrichia. Legs: all tibiae yellow on apical 1/10, front and mid tibia on basal 1/3, and hind tibia on basal 1/6; front tarsi with basitarsus sometimes yellow and mid tarsi with basitarsus and sometimes even second tarsomere yellow; basitarsus of mid tarsi cylindrical, 1.7-2.0 times longer than second tarsomere; front femur with black setae on apical 1/5; setae on posterolateral surface of hind tibia 1.5-1.6 times as long as the width of the tibia; tergite II 1.6-2.0 times wider than long, 1.10-1.16 times longer than tergite III, and 1.06-1.12 times longer than tergite IV.

Discussion. This was mentioned by van der Goot (1981) as species nova to be described at a later date. Most specimens studied here were labelled as *P. verrucula* Lucas, an

unpublished name. Šimić (1987), however, described the species and gave it the name *P. bispina*.

Pipizella brevis Lucas, 1976: 7.

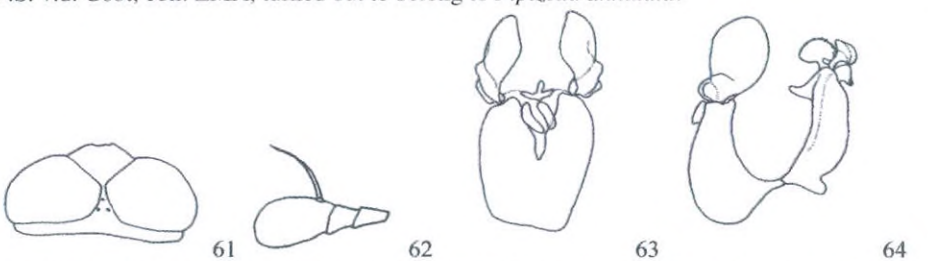
Type material. The holotype male and allotype female: **Spain:** Gerona, Nuria, 1800-2000m, 28.vii.1970, leg. J.A.W. Lucas, coll. ZMA, and 24 paratypes (all coll. ZMA) were studied by the second author.

Other material. **Andorra**: Camping font des Ferrosins, Oosthelling, 1800-1900m, 30.vii.1995, 1♂, leg. B. Wakkie, coll. ZMA.

Description. Male. Head: ratio of width of face and width of head 1:2.6-2.8; eyes not coalescent (Fig. 61) or only touching at one point; setae on eyes black and white, 0.09mm; postpedicel 1.5 times longer than wide (Fig. 62), arista dark. Wing: entirely covered with microtrichia. Legs: black, basal 1/4-1/3 of front and mid tibia and basitarsus of front and mid tarsi yellow; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.7-1.9 times longer than second tarsomere; setae on femora yellow; setae on posterolateral surface of hind tibia 1.2-1.3 times longer than tibial width. Abdomen: setae black and light brown, sternite VIII with yellow setae; tergite II 1.9-2.1 times wider than long, 1.12-1.13 times longer than tergite III, and 0.88-0.94 x longer than tergite IV; tergite IV 1.6 times longer than sternite IV. Genitalia (Figs 63, 64): epandrium in lateral view wide at the base and small at the top, squarish in dorsal view; surstylus with very wide and rounded top, and a side projection at the base; epandrial arms very short; post-anal hood a small sharp tooth; hypandrium long and slender with a pointed process which is wide at the base; lower gonocercus squarish with serrated apical margin; upper gonocercus cockscomb-like with small dents on apical margin. Length 6.2-6.4mm, wing length 4.4-4.5mm.

Female. Confirmed material not examined.

Discussion. One paratype ♂: **Spain:** Gerona, Nuria, 1800-2000m, 22.vii.1970, leg. V.S. v.d. Goot, coll. ZMA, turned out to belong to *Pipizella annulata*.



Figs 61-64. ***Pipizella brevis*** **♂: 61, head, dorsal view (paratype); 62, left antenna, lateral view (paratype); 63-64, genitalia (Andorra): 63, dorsal view; 64, lateral view.**

Pipizella calabra (Goeldlin de Tiefenau, 1974: 238).

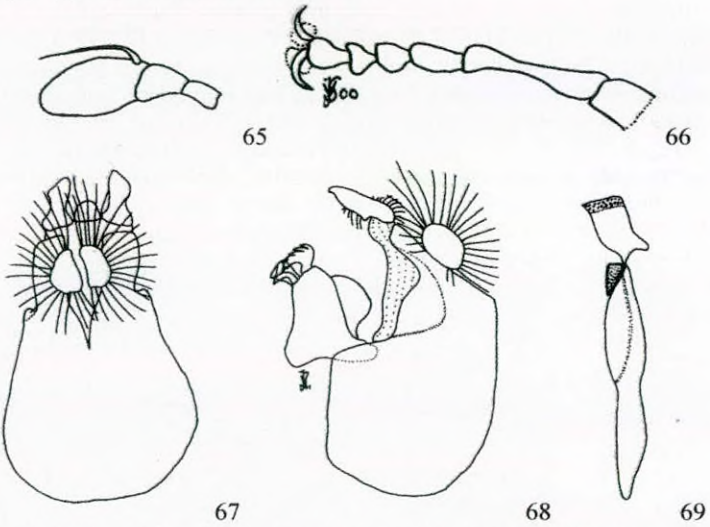
Pipizella macrobasalis Lucas, 1976: 10. **syn. n.**

Type material. No type material of *P. calabra* was studied. The holotype male: **Italy:** Abruzzi, prov. Aquila, Ovindoli-Mt. Sirenti, 1450-1750m, 18-23.vii.1960, leg V.S. van der Goot, coll. ZMA and 2 paratypes coll. ZMA of *P. macrobasalis* were studied by the second author. Based on the description of *P. calabra* it is conspecific with *P. macrobasalis*.

Other material. **Italy**: Bardonecchia (TO), Rochemolles, Gr. Picreaux, 2040m, 1♂, 13.vii.1998, leg. Delmastro, coll. DSV.

Description. Male. Similar to *P. viduata*. Head: ratio of width of face and width of head 1:2.5-2.6; ratio of length of eye contiguity and length of the frons 1:1.8-2.2; postpedicel 1.8-2.4 times longer than wide (Fig. 65), arista yellow at basal 1/2-2/3. Wing: entirely covered with microtrichia. Legs: predominantly black; yellow on basal 1/6-1/4 of front and mid tibia; basitarsus of mid tarsi compressed (Fig. 66) with yellow bristles, 2.0-2.2 times longer than second tarsomere; front femur with black setae on apical 1/3-2/3; mid femur with black setae, which are shorter and stouter than the yellow setae, on apical 1/4-1/3; setae on posterolateral surface of hind tibia 1.2-1.4 times longer than tibial width. Abdomen: setae black and yellow, pregenital segment with black setae, sometimes with white setae intermingled; tergite II 1.8-2.2 times wider than long, 1.12-1.25 times longer than tergite III, and 1.00-1.11 times longer than tergite IV; tergite IV 1.8-1.9 times longer than sternite IV. Genitalia (Figs 67-69) with voluminous capsule: epandrium huge, twice as long as hypandrium; epandrial arms longer than surstylus; cerci with unusual long setae, some setae longer than surstylus; inner median flange of hypandrium circular; upper gonocercus with seven teeth. Length 5.2-6.1mm, wing length 4.1-4.7mm.

Female. Confirmed material not examined.



Figs 65-69. ***Pipizella calabra*** ♂ **(paratype** ***P. macrobasalis*****): 65, left antenna, lateral view; 66, basitarsus of mid tarsus, dorsal view; 67-69, genitalia: 67, dorsal view; 68, lateral view; 69, aedeagus, lateral view.**

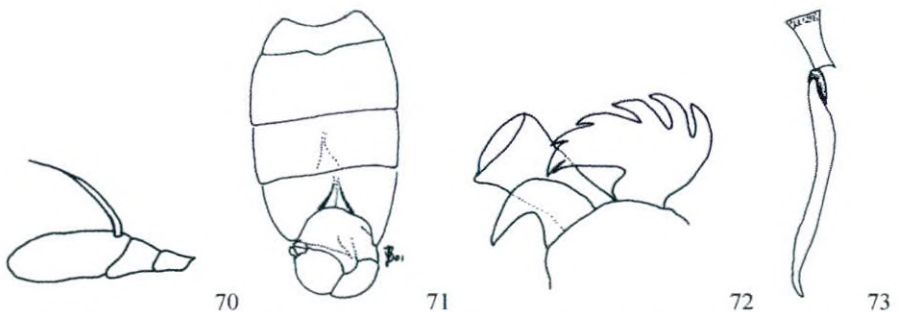
Pipizella cantabrica Claussen, 1991: 166.

Type material. The male holotype: **Spain**: Santander, Fuente Dé, 1080m, small meadow at little stream protected from browsing, 28.iv.1986, leg. R. Hall, coll. ZML and two paratypes with same data were studied by the first author.

Other material. Spain: Eibar, 6.ix.1952, 1♂, leg. Bär, Blöte, de Jong & Oase, coll. NAL; Oviedo or Leon, Puerto de Pajares, 1350-1700m, 11.vii.1972, 7♂, leg. V.S. v.d. Goot & J.A.W. Lucas, coll. ZMA.; ibid, 12.vii.1972, 8♂; ibid, 13.vii.1972, 12♂; ibid, 14.vii.1972, 9♂; ibid, 15.vii.1972, 2♂; ibid, 16.vii.1973, 2♂; ibid, 18.vii.1972, 5♂; ibid, 19.vii.1973, 1♂;

ibid, 20.vii.1973, 1♂; ibid; 21.vii.1972, 1♂; ibid, 22.vii.1972, 12♂; Oviedo, Pajares, 1000m, 20.vii.1972 3♂, leg. V.S. v.d. Goot & J.A.W. Lucas, coll. ZMA; Guipuzcoa, Aranzazu, 4.vii.1973, 2♂, leg. J.A.W. Lucas, coll. ZMA; ibid, 7.vii.1973 1♂; Guipuzcoa, San Prudencia, 9.vii.1973, 2♂, leg. J.A.W. Lucas, coll. ZMA; ibid, 10.vii.1973, 5♂; Guipuzcoa, Mondragon, 11.vii.1973, 1♂, leg. J.A.W. Lucas, coll. ZMA, Guipuzcoa, Vergara, 12.vii.1973, 1♂, leg. J.A.W. Lucas, coll. ZMA; Spain, Donostia, Igueldo, west of village 43°18'N 2°03'W, 19.vi.2001, 1♂, leg. & coll. AET, DNA voucher specimen No S 346, G. Ståhls, FMNH.

Description. Male. Head: ratio of width of face and width of head 1:2.4-2.6; ratio of length of eye contiguity and length of the frons 1:2.8-3.4; setae on eyes black and light brown, 0.09mm; postpedicel 2.0-2.3 times longer than wide (Fig. 70), arista dark with basal 1/4 sometimes light. Wing: entirely covered with microtrichia. Legs: predominantly black; front and mid tibiae yellow on basal 1/8-1/3 and sometimes basitarsus of mid tarsi yellow; basitarsus of mid tarsi entirely covered with yellow bristles, compressed, 2.0-2.3 times longer than second tarsomere; setae on femora black and yellow; setae on apical half of front femur black; setae on apical 1/4 of mid and hind femur black, those on mid femur stouter than yellow setae; setae on posterolateral surface of hind tibia yellow with black mixed, 1.2-1.5 times longer than tibial width. Abdomen: setae black and yellow, pregenital segment with black and yellow setae; tergite II 1.8-2.0 times wider than long, 1.17-1.23 times longer than tergite III, and 1.04-1.11 times longer than tergite IV; tergite IV 2.0-2.3 times longer than sternite IV; sternite IV posteriorly with sharp median keel (Fig. 71). Genitalia (Figs 1, 2, 72, 73) similar to *P. viduata*; epandrial arms long, as long as surstylus; cerci long and narrow; epandrium large, as in *P. speighti*, intermediate between *P. viduata* (small) and *P. calabra* (huge); surstylus wide at base and tapering gradually, small compared with epandrium; hypandrium without widened base; inner median flange wide at base, tapering sharply, disappearing well before upper hypandrial process; upper gonocercus with seven teeth. Length 4.3-6.6mm, wing length 3.6-4.8mm.



Figs 70-73. ***Pipizella cantabrica*** **♂: 70, left antenna, lateral view (Spain); 71, sternites (Spain); 72-73, genitalia (Spain): 72, apical part of hypandrium, lateral view; 73, aedeagus, lateral view.**

Female. Head: ratio of width of face over lunula respectively over ocelli and width of head 1:2.3 and 1:2.8; frons with white setae, some black setae in front of ocelli without pollinose areas; postpedicel 2.3-2.5 times longer than wide, arista yellow on basal 2/5. Wing: cell BM entirely covered with microtrichia. Legs: manly black, yellow on knees, apical 1/5 of mid tibia and basitarsus of mid tarsi; basitarsus of mid tarsi entirely covered with yellow

bristles, cylindrical, 2.0-2.1 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.2-1.3 times longer than tibial width. Abdomen: tergite II 2.2-2.3 times wider than long, 1.06-1.09 times longer than tergite III, and as long as tergite IV. Length 6.1mm, wing length 4.0mm.

Pipizella caucasica Skufjin, 1976: 932.

Type material. No type material was studied.

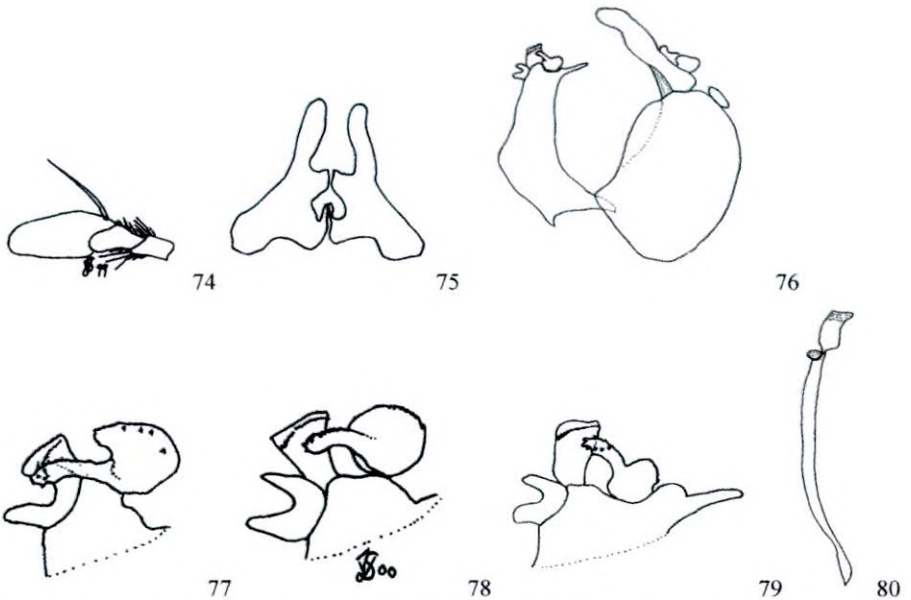
Other material. **Turkey**: prov. Kars, Handre, 20km W of Sarikamiş, 2100-2200m, 1.viii.1983, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Erzurum, Erzurum, Palandöken Dagl., 2450m, 11.vii.1986, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Erzurum, Kayak, Palandöken Dagl., 2200m, 25.vii.1992, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Gümüshane, Kop Dagh Geçidi, 2350m, 20.vii.1989, 7♂, leg. J.A.W. Lucas, coll. ZMA; prov. Gümüshane, Kop. Dagh Geçidi, 2350m, 22.vii.1989, 1♂, leg. J.A.W. Lucas, coll. ZMA; Beğendik, Demirköy, Kirklareli, 8.viii.1995, 1♂, leg. R. Hayat, coll. CCF; Güngörmez, Erzurum, 2500m, 4.viii.1990, 1♂, leg. R. Hayat, coll. CCF; Turnali, Senkaya, Erzurum, 20.vi.1997, 1♂, leg. E. Yilduin, coll. CCF; TR. Erzurum, P. Döken-Konakköyü, 2200m, 24.vii.2000, 2♂, leg. H. Öcalan, coll. CCF; TR. Erzurum, Pazaryolu-Kirklar Dağı, 3300m, 5.vii.2000, 1♂, leg. G. Güçlü, DNA voucher specimen No 347 G. Ståhls, FMNH, coll. CCF; **Iran**: Mazandaran Province (close to Caspian sea), Kandovan Road, 2600m, 3.vii.1995, 1♂, leg. & coll. E. Gilasian.

Description. Male. Head: ratio of width of face and width of head 1:2.7-2.9; ratio of length of eye contiguity and length of the frons 1:2.9-4.1; setae on eyes black and white, 0.09mm; postpedicel 2.0-2.5 times longer than wide (Fig. 74), arista dark. Wing: entirely covered with microtrichia and with yellow basal veins. Legs: black with femora yellow on apical 1/10, front and mid tibia yellow on basal 1/5-1/3 and apical 1/10, hind tibia yellow on basal 1/10-1/5; basitarsus of mid tarsi sometimes yellow; basitarsus of mid tarsi cylindrical, 1.7-2.0 times longer than second tarsomere; setae on femora yellow; setae on posterolateral surface of hind tibia 1.5-1.8 times longer than tibial width. Abdomen: setae black and white, pregenital segment with white setae; tergite II 1.5-1.8 times wider than long, 1.14-1.25 times longer than tergite III, and 0.89-0.93 times longer than tergite IV; tergite IV 1.6-1.9 times longer than sternite IV. Genitalia (Figs 75-80) similar to *P. kuznetzovi*; surstylus with sharp top corner and with parallel margins (in *P. kuznetzovi* with rounded top corner without parallel margins), in lateral view nearly straight throughout (in *P. kuznetzovi* widest on medial part) (see also *P. elegantissima*). Length 5.2-7.5mm, wing length 3.8-4.8mm.

Female. Confirmed material not examined.

Discussion. Figure 10 of Claussen and Hayat (1997) is misleading as the upper gonocercus is bent upwards in their figure. We do, however, agree with Claussen and Hayat (1997) that the specimen studied here and *P. elegantissima* belong to different species. If *P. caucasica* and *P. elegantissima* are conspecific, *P. elegantissima* should be regarded as the older name. *Pipizella caucasica* was published on 28.xii.1976. The date of publication of *P. elegantissima* is lacking; however, on one of the issues of the journal in which *P. elegantissima* is described F. Willemse (author of a paper in the same issue) wrote "ontv. 1.xi.1976", which means received on 1.xi.1976. According to the ICZN this date is valid as publication date and indicating that *P. elegantissima* was published before *P. caucasica*.

Claussen and Hayat (1997) give an altitudinal range from 1750-2500m above sea level for *P. caucasica*. Only two of the four specimens mentioned by Claussen and Hayat (1997) were studied, both belonging to *P. caucasica*. As *P. caucasica* has not been recorded below 2100m, the other two could be *P. kuznetzovi*.



Figs 74-80. *Pipizella caucasica* ♂ **(Turkey): 74, left antenna, lateral view; 75-80, genitalia: 75, surstylus, dorsal view; 76, lateral view; 77-79, apical part of hypandrium, lateral view; 80, aedeagus, lateral view.**

Pipizella cauta Violovitsh, 1981: 73

Type material. No type material was studied. For this reason no conclusions will be drawn about the possible synonymy.

Other material. No other material was studied.

Discussion. Based on the original description and drawings it is similar to *P. maculipennis*. The most striking differences from *P. maculipennis* mentioned by Violovitsh (1981) are the non-infuscated wing (infuscated in *P. maculipennis*), postpedicel about twice as long as wide (3 times in *P. maculipennis*), mesonotum and pleura covered with white setae (light yellow in *P. maculipennis*), and upper gonocercus with 5-6 teeth (4-5 in *P. maculipennis*).

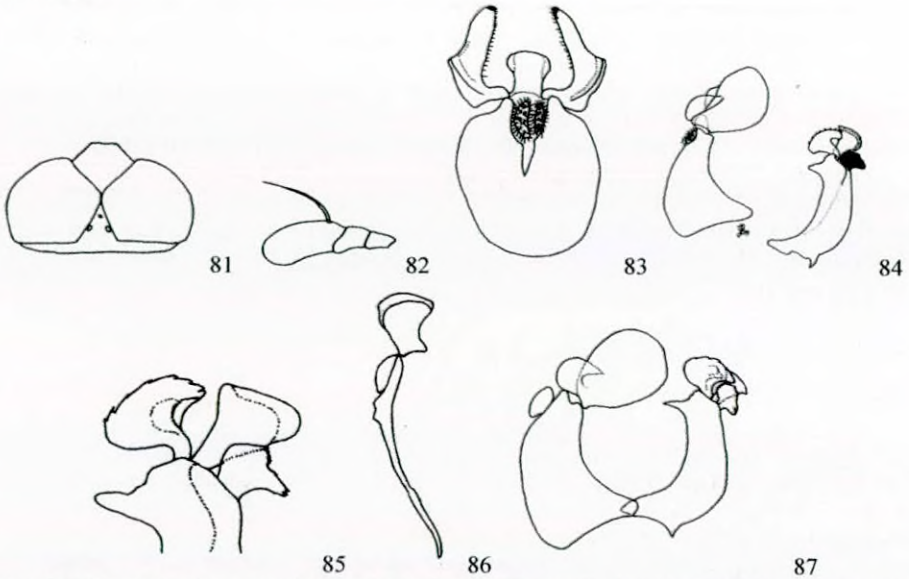
Pipizella certa Violovitsh, 1981: 69.

Type material. No type material was studied.

Other material. Finland: Jokioinen, 5.vii.1969, 1♂, leg. H. Hippa, coll. NRM; EH, Somero, 30.vi.1965, 1♂, leg. H. Hippa, coll. JSA; LK, Imatra, 16.vii.1987, 1♂, leg. J.A.W. Lucas, coll. ZMA; **Russia**: Novosibirsk 2.vi.1983 leg. N. Violovitsh, coll. TNS; **Sweden**: Gotland, Hejnum, Kallgateburg, RN 6400-1671, 9.vii.2000, 1♂, leg. & coll. JSA; Närke,10F3g1, on *Juniperus communis*, 3.vii1987, 1♂, leg. & coll. HBJ.

Description. Male. Head: ratio of width of face and width of head 1:2.6-2.9; ratio of length of eye contiguity and length of the frons 1:2.8-3.5 (Fig. 81); setae on eyes 0.07mm black and brown; postpedicel 1.9-2.3 times longer than wide (Fig. 82), arista yellow on basal 1/4. Wing: entirely covered with microtrichia. Legs: black with femora yellow on apical

1/10, front and mid tibiae yellow on basal 1/4-1/3 and apical 1/10-1/5, basitarsus of front tarsus yellow, at least basitarsus and fifth tarsomere of mid tarsus yellow; basitarsus of mid tarsus entirely covered with yellow bristles, cylindrical, 1.8-2.2 times longer than second tarsomere; setae on front femur black on apical ¼; setae on posterolateral surface of hind tibia 1.4-1.6 times longer than tibial width. Abdomen: setae yellow and black, pregenital segment with yellow setae; tergite II 1.8-1.9 times wider than long, 1.03-1.10 times longer than tergite III, and 0.92-0.97 times longer than tergite IV; tergite IV 1.7-1.9 times longer than sternite IV. Genitalia (Figs 83-87) similar to *P. brevis*; post-anal hood large and widely spoon shaped; upper hypandrial process robust; surstylus wide and concave. Length 6.0-7.3mm, wing length 4.1-5.0mm.



Figs 81-87. ***Pipizella certa*** ♂**; 81-86 (Finland): 81, head, dorsal view; 82, left antenna, lateral view; 83-86, genitalia: 83, dorsal view; 84, lateral view; 85, apical part of hypandrium, lateral view; 86, aedeagus; 87, genitalia (Russia), lateral view.**

Female. Confirmed material not examined.

Discussion. Based on the studied material: one male from Russia (determined by Violovitsh as *P. certa*), two males from Finland (determined as *P. brevis* by Kuznetzov), and the description and drawings of *P. certa* we conclude that *P. certa* is a distinct species, and not a junior synonym of *P. brevis* as proposed by Kuznetzov (1987a). Records of *P. annulata*, especially female specimens, from Finland could refer to this species, as *P. certa* is locally abundant in southern Finland (H. Hippa *pers. comm.*).

Pipizella cornuta Kuznetzov, 1987a: 429.

Type material. The following paratypes were studied by the first author: **Georgia**: Кавказ [Central Caucasus] Сев. Осетия [Southern Ossetia] Цей.ущ. Ю. скл. Цей. хр. 2000m, 1.vii.1984, 1♂, leg. С. Ю. Кузнецов (S. Yu Kuznetzov), coll. ZIAS; Сев. Осетия [Southern

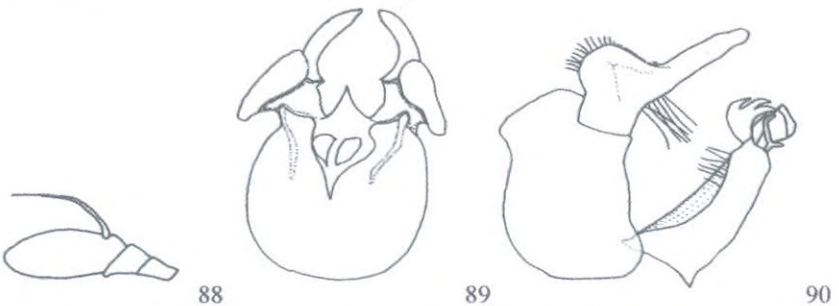
Ossetia], Ю. скл. Цейск. хр. Цей. кладбище, 1950m, 28.iv.1984, 1♂, leg. С. Ю. Кузнецов (S. Yu Kuznetzov), coll. ZIAS.

Other material. No other material was studied.

Description. Male. Head: ratio of width of face and width of head 1:2.5-2.6; ratio of length of eye contiguity and length of the frons 1:2.1-2.3; setae on eyes light-brown 0.07mm long; postpedicel 2.3 times longer than wide (Fig. 88), arista dark. Wing: entirely covered with microtrichia. Legs: predominantly black, yellow on basal 1/10 of front and mid tibia and basitarsus of mid tarsi; femoral setae yellow; setae on posterolateral surface of hind tibia long 2.1-2.3 times longer than tibial width; basitarsus of mid tarsi entirely covered with yellow bristles, slightly compressed posterior, 1.7-1.8 times longer than second tarsomere. Abdomen: setae black and yellow, sternite VIII with yellow setae only; tergite II 1.7 times wider than long, 1.12 times longer than tergite III, as long as tergite IV; tergite IV 2.0-2.1 times longer than sternite IV. Genitalia (Figs 89, 90): epandrium, dorsal view, with very short arms; post-anal hood a sharp triangle; surstylus with wide base and narrow and elongate apex; hypandrium straight with narrow inner median flange; upper gonocercus with four teeth; lower gonocercus very widely bifurcate. Length 5.9-6.2mm, wing length 4.0-4.3mm.

Female. Confirmed material not examined.

Discussion. The labels on the studied specimens do not exactly correspond with the data given by Kuznetzov (1987a). The accurate label information is given here, without any abbreviations.



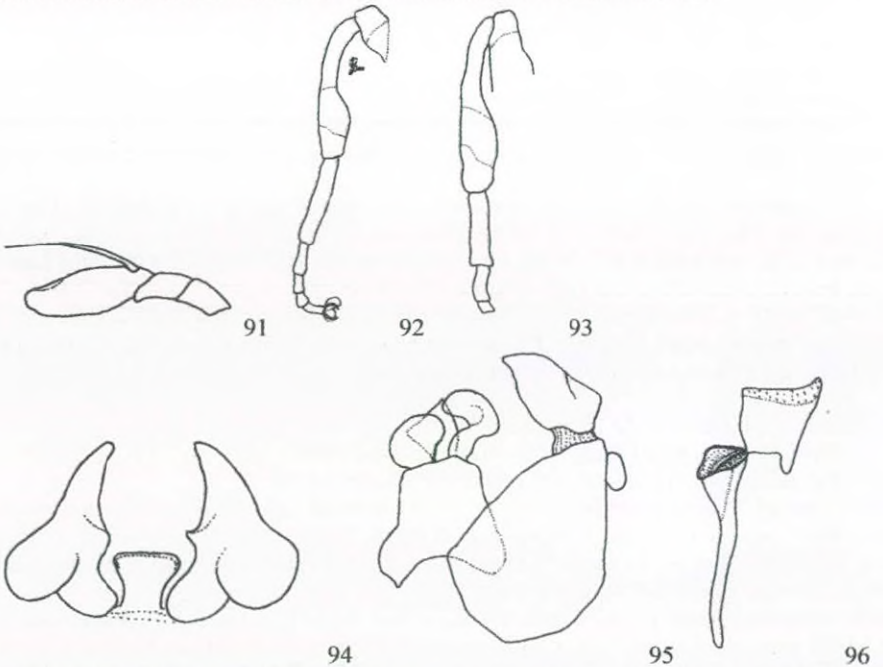
Figs 88-90. ***Pipizella cornuta*** ♂ **(paratype): 88, left antenna, lateral view; 89-90, genitalia: 89, dorsal view; 90, lateral view.**

Pipizella curvitibia Stackelberg, 1960: 438.

Type material. The male holotype was studied by the first author: **Azerbaijan**: Кялахан (Central Caucasus), Лериксого р-на, Талыш, 27.v.1959, leg. В. Рихтер (V. Richter), coll. ZIAS.

Other material. Georgia: Transcaucasus, Bakuriani, 24.vi.1986, 1♂, leg. S. Kuznetzov, coll. ZMA; **Turkey**: prov. Kars, 10km E Karakurt, 1460m, 31.v.1988, 1♂, leg. Warncke, coll. ZMA; prov. Erzurum, Ovit Geçidi S. side, 1900m, 18.vii.1989, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Erzurum, Erzurum (Kayak), Palandöken Dagl., 2200-2300m, 11.vii.1986, 3♂, leg. J.A.W. Lucas, coll. ZMA; prov. Hakkári, Suvarihalil pas, 2500-2600m, 14.vi.1984, 1♂ leg. J.A.W. Lucas, coll. ZMA; prov. Hakkári, Sat Daglari, Varegös, 1600-1650m, 18.vi.1984, 1♀, leg. J.A.W. Lucas, coll. ZMA; prov. Hakkári, Mt Sat, Varegös, 1800m, 21.v.1989, 1♀, leg. Warncke, coll. ZMA; prov. Gumüshane, Köshe Dag Geçidi E. side, 1700m, 25.vii.1989, 1♀, leg. J.A.W. Lucas, coll. ZMA; Sorkunlu, Ilica, Erzurum, 1800m, 30.vii.1998, 1♀, leg. R.

Hayat, coll. AUE; Eğerti, Ilica, Erzurum, 15.vii.1997, 1♀, leg. E. Kiliç, coll. AUE; Güngörmez, Erzurum, 2500m, 28.vii.1998, 1♂, leg. R. Hayat, coll. AUE; TR, Erzurum, Ilica, Aflikonak, 2000m, 11.vi.2000, 1♂, leg. Ö. Çalmaşur, coll. AUE, DNA voucher specimen No S 351, G. Ståhls, FMNH; TR, Rize, Ikizdere, Ovit, 2000m, 29.vii.2000, 1♀, leg. R. Hayat, coll. AUE; TR, Erzurum, Aşkale, Kopdağı, 2200m, 16.vi.2000, 1♀, leg. S. Pekel, coll. AUE, Rabat/Pasinler, Erzurum, 2400m, 10.vii.1997, 1♂, leg. I. Aslan, coll. AUE.



Figs 91-96. ***Pipizella curvitibia*****: 91, left antenna, lateral view ♂ (Turkey); 92-93, left mid tibia and tarsi, lateral view (Turkey): 92, ♂; 93, ♀; 94-96, genitalia ♂ (Russia): 94, apical part of epandrium, dorsal view; 95, lateral view; 9, aedeagus, lateral view.**

Description. Male. Head: ratio of width of face and width of head 1:2.2-2.5; ratio of length of eye contiguity and length of the frons 1:2.5-3.1; setae on eyes light-brown and long 0.15mm; postpedicel 2.5-2.7 times longer than wide (Fig. 91), arista yellow on basal half. Wing: first basal cell covered by microtrichia over 95%; basal wing veins yellow. Legs: mid leg with club-like tibia and elongate basitarsus (Fig. 92); extensively yellow: apical 1/5 of front and mid femur; front and mid tibia on basal 1/2-4/7 and apical 1/6, hind tibia 1/5 and 1/10, basitarsus of front tarsi and basitarsus and second tarsomere of mid tarsi; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 2.5-2.9 times longer than second tarsomere; femoral setae yellow; setae on posterolateral surface of hind tibia 1.9-2.1 times longer than tibial width. Abdomen: setae predominantly yellow, some black setae on posterior margin of tergites II-IV; pregenital segment with yellow setae; tergite II 1.3-1.5 times wider than long, 1.08-1.13 times longer than tergite III, and 0.89-1.00 times longer than tergite IV; tergite IV 1.4-1.5 times longer than sternite IV. Genitalia (Figs 94-96): epandrium

triangular; post-anal hood square shaped; surstylus in dorsal view with a small tooth on inner-medial surface; hypandrium short and very wide; upper gonocercus cock-comb like with long base and without teeth dorsally; lower gonocercus an oval plate; aedeagus wide with vertical placed ventrolateral process. Length 7.4-8.9mm, wing length 5.9-6.1mm.

Female. Similar to male, except for the usual sexual dimorphism. Mid leg with club-like tibia and elongate basitarsus (Fig. 93).

Pipizella dentata Violovitsh, 1981: 74 (written as *adentata*)
Type material. No type material was studied.
Other material. No other material was studied.

Description. Based on the original description and drawings it is similar to *P. viduata* and *P. vandergooti* (see under these species). It is, however, clear that these species are not conspecific.

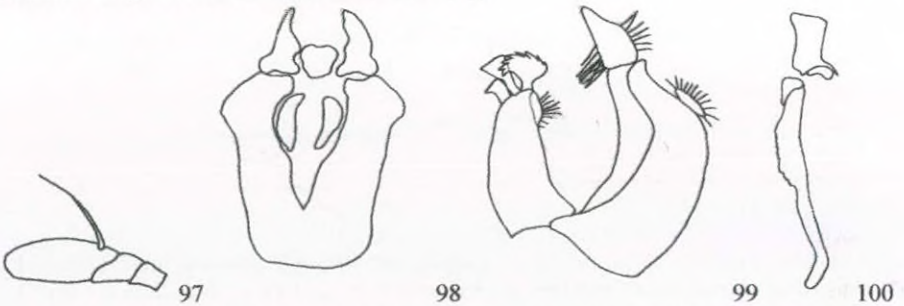
Discussion. In the original publication the species name is written as "*Pipizella adentata* Violovitsh spec. nov.". In the key to the described species (page 64) and under the drawings of the genitalia (page 75) the name "*Pipizella dentata*" is used for the same species. If the species considered here as *P. dentata* should bear the name *P. adentata*, the real *P. adentata* which is described after *P. dentata* would become a homonym and therefore it should get another name. The true *P. adentata* is however synonymised with *P. altaica* and therefore it is unwise to change the name of *P. adentata*.

Pipizella divicoi (Goeldlin de Tiefenau, 1974: 238).
Pipizella absurdens Lucas, 1976: 8 (syn. Lucas 1976).
Pipizella opaca Violovitsh, 1981: 76 (syn. Kuznetzov 1987a).
Type material. No type material of *P. divicoi* was studied. The holotype: **Czechoslovakia:** Slov., Domica, 25.v.1959, leg. M. Chvála, coll. ZMA, allotype and 37 paratypes (coll. ZMA, IAG, NMP and E. Torp Pedersen, Denmark) of *P. absurdens* were studied by the second author. No type material of *P. opaca* was studied.
Other material. Russia: Зап. Саян., окр.г., Абаза, 9.vi.1981, 1♂, leg. A. Баркалов, coll. TNS; Novosibirsk, 5.vi.1985, 1♂, leg. Violovitsh, coll. TNS; **Georgia**: Central Caucasus, Tsey, 2000m, 30.vi.1984, 2♂, leg. Kuznetzov, coll. ZMA; **Turkey**: prov. Erzurum, 14km E Erzurum, 1850m, 10.vii.1986, 2♂, leg. J.A.W. Lucas, coll. ZMA; prov. Ezurum, Kayak, Palandöken Dagl., 2200-2300m, 11.vii.1986, 10♂, leg. J.A.W. Lucas, coll. ZMA; ibid, 12.vii.1986, 3♂; ibid, 26.ii.1992, 1♂; prov. Erzurum, Ovit Geçidi S. side, 1900m, 17.vii.1992, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Hakkári, Mt Sat, Varegös, 21.v.1989, 1♂, leg. Warncke, coll. ZMA; prov. Hakkári, Suvarihalil pas, 2500-2600m, 14.vi.1984, 11♂ leg. J.A.W. Lucas, coll. ZMA; prov. Kars, 8km W of Sarikamiş, 2000m, 7.vii.1986, 2♂, leg. J.A.W. Lucas, coll. ZMA; prov. Kars, 20km W Sarikamiş, 2100m, 5.vii.1985, 1♂, leg. C.J. Zwakhals, coll. ZMA; prov. Kars, Saganii, Sarikamiş, 2100m, 29.v.1983, 1♂, leg. W. Schacht, coll. ZMA; prov. Kars, 15km E Karakurt, 1460m, 2.vi.1988, 1♂, leg. Warncke, coll. ZMA; prov. Tralzon, 12km S Maçka, 1450m, 30.vii.1989, 1♂, leg. J.A.W. Lucas, coll. ZMA. Material from Belgium, Croatia, Czech Republic, France, Germany, Greece, Slovakia, and Switzerland was also studied.

Description. Male. Head: ratio of width of face and width of head 1:2.3-2.6; ratio of length of eye contiguity and length of the frons 1:2.0-2.5; setae on eyes white and dark, 0.09mm; postpedicel 2.3-2.7 times longer than wide (Fig. 97), arista yellow on basal 1/3. Wing: entirely covered with microtrichia. Legs: predominantly black, yellow on knees, front and mid tibia on basal 1/3, front and mid basitarsus; basitarsus of mid tarsi entirely covered

with yellow bristles, cylindrical, 1.7-1.9 times longer than second tarsomere; setae on femora yellow, some black setae on apical 1/5 of front femur; setae on posterolateral surface of hind tibia 1.6-1.7 times longer than tibial width. Abdomen: with black and white setae, pregenital segment with white setae; tergite II 1.9-2.1 times wider than long, 1.07-1.17 times longer than tergite III, and 0.93-1.05 times longer than tergite IV; tergite IV 2.0-2.3 times longer than sternite IV. Genitalia (Figs 98-100): epandrium, in lateral view, narrow, in dorsal view with wide shoulders; surstylus relatively short, as long as cercus; hypandrium straight; upper gonocercus with five teeth; lower gonocercus hook-shaped. Length 5.6-7.2mm, wing length 4.2-5.2mm.

Female. Very similar to *P. bispina*. Clearest difference is found in the wider abdomen. Tergite II 2.1-2.3 times wider than long.



Figs 97-100. ***Pipizella divicoi*** **♂ (France): 97, left antenna, lateral view; 98-100, genitalia: 98, dorsal view; 99, lateral view; 100, aedeagus, lateral view.**

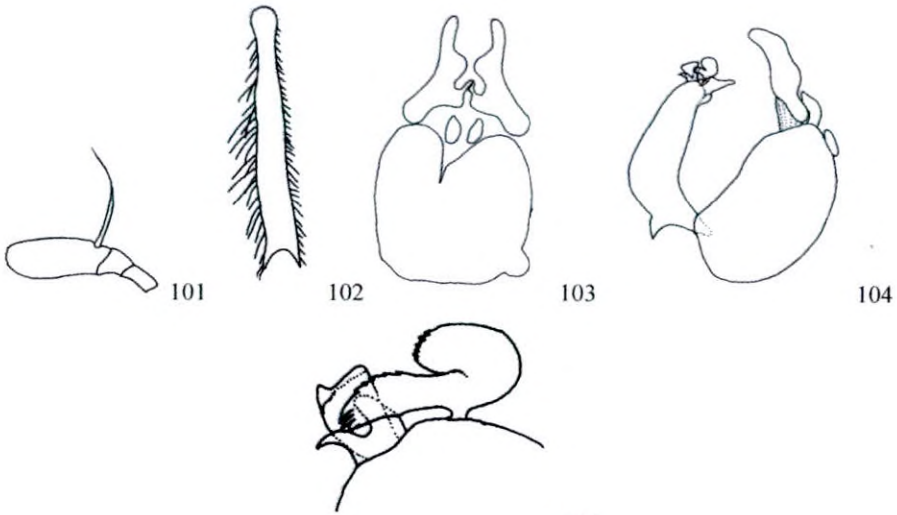
Pipizella elegantissima Lucas, 1976: 8.

Type material. The holotype male: **Italy:** Calabria, Sila Grande, Fondente, 1350-1500m, 23.vii.1959, leg. Bink, van der Goot and Theowald, coll. ZMA and 4 paratypes (coll. ZMA) were studied by the first author.

Other material. Italy: Bologna, Castiglione dei Pepoli, 600-700m, 1.vii.1985, 2♂, leg. J.A.W. Lucas, coll. ZMA.

Description. Male. Head: ratio of width of face and width of head 1:2.7-2.8; ratio of length of eye contiguity and length of the frons 1:2.0-2.3; setae on eyes black and white 0.07mm; postpedicel 2.1-2.4 times longer than wide (Fig. 101), arista yellow on basal 1/2. Wing: covered for more than 98% with microtrichia. Legs: predominantly black, yellow on knees, front and mid tibiae on basal 1/3, and mid basitarsus; setae on femora yellow; setae on posterolateral surface of hind tibia 1.3-1.5 times longer than tibial width (Fig. 102); basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.6-1.7 times longer than second tarsomere. Abdomen: with black and white setae, pregenital segment with yellow setae; tergite II 1.7 times wider than long, 1.20-1.23 times longer than tergite III, and 0.91-0.96 times longer than tergite IV; tergite IV 1.6-1.8 times longer than sternite IV. Genitalia (Figs 103-105) (see also *P. kuznetzovi* and *P. caucasica*): surstylus in dorsal view with inner median process not parallel and with a rounded top corner; hypandrial process straight, with a small round appendage at base; upper gonocercus club-like with wide shaft, dentate at base, and wide apex. Length 4.8-6.2mm, wing length 3.6-4.2mm.

Female. Confirmed material not examined.



Figs 101-105. ***Pipizella elegantissima*** ♂ **(paratype): 101, left antenna, lateral view; 102, left hind tibia, dorsal view; 103-105, genitalia: 103, dorsal view; 104, lateral view; 105, apical part of hypandrium, lateral view.**

Pipizella fumida (Goeldlin de Tiefenau, 1974): 239.
Type material. No type material was studied. The holotype ♂ is deposited in MNHN.
Other material. No other material was studied.

Description. Based on the original description (and Goeldlin de Tiefenau *pers. comm.*) the species is similar to *P. maculipennis* and *P. mongolorum*. As no type material of *P. fumida* was studied no conclusion will be drawn about the possible synonymy with the above mentioned species.

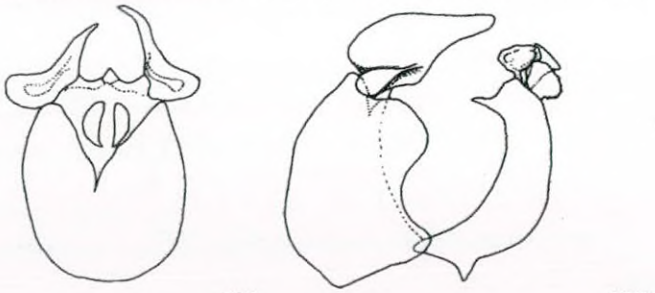
Pipizella inversa Violovitsh, 1981: 67.
Type material. No type material was studied.
Other material. Russia: Новосиб. (Novosib.) обл., окр., Карасука, 25.vi.1982, 1♂, leg. А. Баркалов, coll. TNS.

Description. Male. Head: ratio of width of face and width of head 1:2.6; ratio length of eye contiguity with length of frons 1:2.3; frons with black setae on anterior half; setae on eyes black and white, 0.09mm long; pedicel and postpedicel missing. Wing: covered over 95% with microtrichia. Legs: black and yellow; femora yellow on apical 1/7, front tibia yellow on basal 1/2 and apical 1/6, mid tibia yellow on basal 4/7 and apical 1/6, hind tibia yellow on basal 1/4 and apical 1/10, basitarsus of front and mid tarsi and second tarsomere of mid tarsi yellow; basitarsus of mid tarsi entirely covered with yellow bristles, compressed posteriorly, 2.0 times longer than second tarsomere; setae on femora yellow; setae on posterolateral surface of hind tibia 1.7 times longer than tibial width. Abdomen: setae black and white (sternite VIII missing); tergite II 1.6 times wider than long, 1.14 times longer than tergite III, and 0.97 times longer than tergite IV; tergite IV 1.7 times longer than sternite IV. Genitalia (Figs 106, 107) similar to *P. annulata*; inner surface of epandrium more concave;

cerci more elongate; surstylus relatively larger, as compared with epandrium; hypandrium wider; lower gonocercus squarish with serrated dorsal and lateral margin. Length 6.8mm, wing length 5.0mm.

Female. Confirmed material not examined.

Discussion. *Pipizella annulata* and *P. inversa* are similar. Some differences were found in both genital and non-genital characters. As no type material of *P. inversa* was studied no conclusion will be drawn about the synonymy proposed by Kuznetzov (1987a).



106 107

Figs 106-107. ***Pipizella inversa*** **(Russia): genitalia: 106, dorsal view; 107, lateral view.**

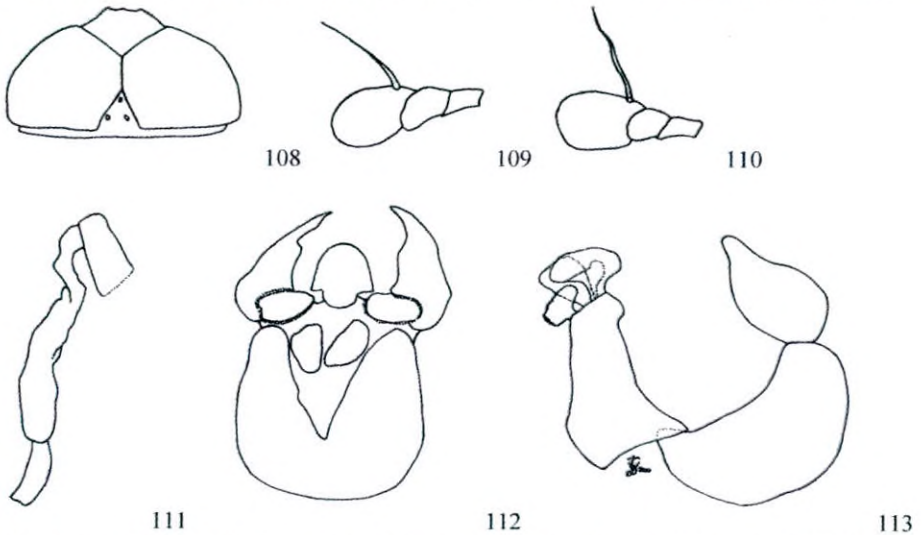
Pipizella lyneborgi Torp, 1971: 232.

Type material. The male holotype and female paratype were studied by the first author: **Spain**: Granada, Sierra de Contraviesa, Rabite, 1300m, 2.v.1966, leg. Lyneborg & Langemark, coll. ZMUC; **Spain**: Granada, Sierra Nevada, near Padul, 1300m, 4.v.1966, leg. Lyneborg & Langemark, coll. ZMUC.

Other material. Spain: Madrid, Fuencarral, 14.iv.1973, 1♀, leg. V.S. v.d. Goot & J.A.W. Lucas, coll. ZMA; Madrid, El Escorial, 18.iv.1973, 1♀, leg. V.S. v.d. Goot & J.A.W. Lucas, coll. ZMA; Avila, Sierra de Gredos, Navarredonda de Gredos, 1600m, 2.vii.1972, 1♀, leg. V.S. v.d. Goot & J.A.W. Lucas, coll. ZMA; Bajares, Ain-Port, 12.iv.1973, 1♀, leg. J.A.W. Lucas, coll. ZMA; Granada, Polopos, 410m, 23.iii.2001, 1♂, leg & coll. J. Dils, DNA No 181 G. Ståhls, FMNH.

Description. Male. Setae long and whitish. Head: ratio of width of face and width of head 1:2.2-2.4; ratio of length of eye contiguity and length of the frons 1:1.4-1.6 (Fig. 108); setae on eyes dark on upper half, white on lower half, 0.11mm; postpedicel 1.3-1.5 times longer than wide (Fig. 109), arista dark. Wing: areas without microtrichia confined to the basal part of second costal cell. Legs: black, tibiae yellow on basal 1/4-1/3 and sometimes basitarsus of mid tarsi; setae on femora white; setae on posterolateral surface of hind tibia 1.6 times longer than tibial width; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.9 times longer than second tarsomere. Abdomen: setae predominantly white, some black setae along medial line, sternite VIII with white setae; tergite II 1.9-2.0 times wider than long, 1.07-1.09 times longer than tergite III, and 0.91-1.00 times longer than tergite IV; tergite IV 1.3-1.4 times longer than sternite IV. Genitalia (Figs 112, 113): epandrium sickle shaped in lateral view, squarish in dorsal view; post-anal hood oval; hypandrium straight with slightly widened base and small upper process; upper gonocercus cock-comb shaped without teeth; lower gonocercus rectangular shaped with serrated dorsal and lateral margin. Length 7.9-8.8mm, wing length 5.8-6.5mm.

Female. Head: ratio of width of face over lunula respectively over ocelli and width of head 1:2.4-2.5 and 1:3.3-3.5; frons with predominantly white setae without pollinose areas; postpedicel 1.3-1.4 times longer than wide (Fig. 110). Wing: cell BM covered over 80-90% with microtrichia. Legs: more yellow than in male, yellow on apical 1/10 of front and mid femur, basal 1/3 of front tibia, basal half of mid tibia and basal quarter of hind tibia and basitarsus of mid tarsi; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 2.0-2.1 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.3-1.4 times longer than tibial width. Abdomen: tergite II 2.1-2.2 times wider than long, 1.06 times longer than tergite III, and 0.93-0.94 times longer than tergite IV. Length 8.1mm, wing length 5.9mm. One female with symmetrical deformed hind tibia (Fig. 111).



Figs 108-113. ***Pipizella lyneborgi*: 108, head, dorsal view (holotype ♂); 109-110, left antenna, lateral view: 109, holotype ♂; 110, ♀ (Spain); 111, left hind tibia, dorsal view (aberrant ♀, Spain); 112-113, genitalia (holotype ♂): 112, dorsal view; 113, lateral view.**

Pipizella maculipennis (Meigen, 1822: 254).

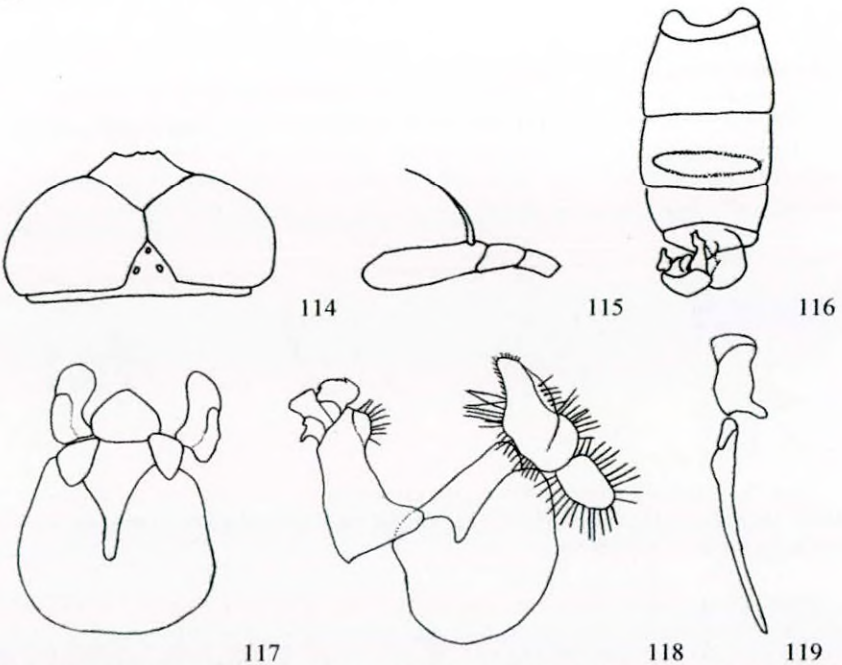
Pipiza varians Rondani, 1847: 343, **syn. n.**

Pipizella sibirica Violovitsh, 1981: 70 (syn. Kuznetzov 1987a).

Type material. The female lectotype of *P. maculipennis* was studied by the second author: no 1204, lectotype des. J.A.W. Lucas. The male lectotype (hereby designated) of *P. varians* (coll. MZF) was studied, bearing the following labels: 1) white label "393, 113"; 2) white label "*Pipizella maculipennis* Meig. det. Lucas et P. Goeldlin 22.ii.1976"; 3) red label "Lectotype"; 4) red label "Lectotype ♂ *Pipiza varians* Rondani, 1847 des. J. van Steenis 2003", and found to be conspecific with *P. maculipennis*. No type material of *P. sibirica* was studied.

Other material. Russia: Алтай (Altai), C. Теректа, 19.vii.1978, 1♂, leg. Левниа, coll. TNS; **Turkey**: prov. Bayburt, Kop Dagl. Geçidi, 2300m, 16.vii.1992, 3♂, leg. J.A.W. Lucas, coll. ZMA; prov. Erzinçan, 19km NW Refahiye, 1800m, 12.vii.1992, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Erzurum, W Refahiye, 1600m, 13.vii.1985, 1♂, leg. W. Schacht, coll. ZMA;

prov. Erzurum, 16km NW Tspir, 1500m, 18.vii.1992, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov Erzurum, Ovit Geçidi, 2km W Cayirozü, 18.vii.1992, 1♂, leg. J.A.W. Lucas, coll. ZMA; prov. Tekidag, Ulas bei Corlu, 30.vii.1982, 1♂, leg. M. Kühbandner, coll. ZMA; Rabat/Pasinler, Erzurum, 13.vi.1996, 1♂, leg. G. Tcelu, coll. AUE; **Afghanistan**: entre Doavi et Doad Ali, A746, 21.vii.1925, 1♀, leg K. Lindberg, coll. ZML. Material from France, Germany, Italy, and Switzerland was also studied; **France:** Dept Var, 300m, Rocbaron, 22.v.2001, 11♂, leg. & coll. G. v/d Weyer, DNA Voucher specimen No S 350, G. Ståhls, FMNH.



Figs 114-119. ***Pipizella maculipennis*** **♂: 114, head, dorsal view (Yugoslavia); 115, left antenna, lateral view (Italy); 116, sternites (France); 117-119, genitalia (Italy): 117, dorsal view; 118, lateral view; 119, aedeagus, lateral view.**

Description. Male. Head (Fig. 114): ratio of width of face and width of head 1:2.4-2.6; ratio of length of eye contiguity and length of the frons 1:1.6-2.0; setae on eyes short (0.09mm) and predominantly dark-brown; postpedicel 2.5-3.0 times longer than wide (Fig. 115), arista entirely dark, sometimes with light basal 1/5. Wing: usually infuscated medially, first basal cell covered over 95% with microtrichia. Legs: black with yellow, basal 1/8-1/4 and apical 1/10 of front and mid tibia and basal 1/10 of hind tibia yellow, basitarsus of mid tarsi and sometimes basitarsus of front tarsi yellow; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.6-1.8 times longer than second tarsomere; setae on posterolateral surface of hind tibia about 1.5-1.8 times longer than tibial width; setae on femora yellow, black setae present on apical 1/3 of front femur. Abdomen: setae black and white to light yellow; pregenital segment with black and white setae; tergite II 1.5-1.6 times

wider than long, 1.15-1.23 times longer than tergite III, and 1.17-1.30 times longer than tergite IV; tergite IV 1.4-1.6 times longer than sternite IV; sternite III with transverse elevation (Fig. 116). Genitalia (Figs 117-119): epandrium small round shaped; post-anal hood and cerci wide triangular shaped; hypandrium straight with small upper process; upper gonocercus with one large and three smaller teeth; lower gonocercus hammer-shaped with one end pointed. Length 5.5-7.3mm, wing length 4.1-5.1mm.

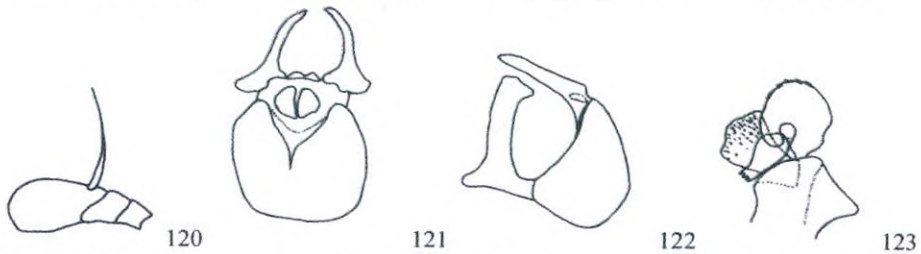
Female. Very similar to male. It is the only species with clearly infuscated wings. The elongate postpedicel, dark legs with moderate long setae on hind femur and rather narrow abdomen will separate this species from *P. viduata* and *P. virens*.

Pipizella mesasiatica Stackelberg, 1952: 352.

Pipizella sogdiana Violovitsh, 1985**:** 86 (syn. Kuznetzov 1987a).

Type material. The following paralectotypes of *P. mesasiatica* were studied by the first author: **Tajikistan**: Тадж. (Tadzjikistan), дол. р. Варзоб, ущ. Кондараб 3.v.1944, 2 ♂, leg. Штакельберг (Stackelberg), coll. ZIAS. No type material of *P. sogdiana* was studied.

Other material. Tajikistan: Badakshan, 22.vii.1985, 1♂, leg. S. Kuznetzov, coll. ZIAS.



Figs 120-123. ***Pipizella mesasiatica*** ♂ **(paralectotype): 120, left antenna, lateral view; 121-123, genitalia: 121, dorsal view; 122, lateral view (apical part dissected); 123, apical part of hypandrium, lateral view.**

Description. Male. Head: ratio of width of face and width of head 1:2.6-2.7; eyes not coalescent; setae on eyes short (0.09mm) and white and brown; postpedicel 1.3-1.5 times longer than wide (Fig. 120), arista dark. Wing: entirely covered with microtrichia. Legs: predominantly black, yellow on basal 1/4 of front tibia, basal 1/3 of mid tibia, basitarsus of mid tarsi and sometimes also basitarsus of front tarsi; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 2.0-2.2 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.5 times longer than tibial width; femoral setae yellow. Abdomen: setae yellow and black, sternite VIII with yellow setae; tergite II 1.8-1.9 times wider than long, 1.10 times longer than tergite III, and 0.97 times longer than tergite IV; tergite IV 2.2-2.3 times longer than sternite IV. Genitalia (Figs 121-123): epandrium relatively small; surstylus elongate; post-anal hood formed by two small humps; hypandrium straight with wide base and triangular shaped upper process; upper gonocercus cockscomb-shaped with about six very small teeth; lower gonocercus rectangular shaped with heavily serrated lateral margin. Length 6.7-6.8mm, wing length 5.1mm.

Female. Confirmed material not examined.

Pipizella mongolorum Stackelberg, 1952: 350.

Type material. The following paralectotypes were studied by the first author: **Mongolia**: Монголия (Mongolia), Халха, верхнее течение р. Онгингол, 12.vii.1926, 1♂, leg. Кириченко, coll. ZIAS; Mongolia, Халха, зап. Берег, оз. Орок-Нор, 14.viii.1926, 1♂, leg. Кириченко, coll. ZIAS.

Other material. Russia: Baikal sea, 27.vii.1986, 2 ♂, leg. S. Kuznetzov, coll. ZMA.

Description. Male. Head: ratio of width of face and width of head 1:2.6; eyes not coalescent; setae on eyes short (0.07mm) and white with brown; postpedicel 1.5-1.7 times longer than wide (Fig. 124), arista dark brown. Wing: first basal cell covered with microtrichia over 95 %. Legs: black with yellow on basal 1/4 of front tibia, basal 1/3-1/2 of mid tibia, and basitarsus of front and mid tarsi; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.7-1.8 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.4 times longer than tibial width; setae on femora yellow. Abdomen: setae yellow and black, sternite VIII with yellow setae; tergite II 1.8-1.9 times wider than long, 1.07-1.15 times longer than tergite III, and 0.91-1.00 times longer than tergite IV; tergite IV 1.6 times longer than sternite IV. Genitalia (Figs 125, 126): epandrium, in lateral view, semicircular and in dorsal view squarish and collared; post-anal hood semicircular; hypandrium with wide base and upper process; upper gonocercus with one tooth; lower gonocercus shaped like the head of a songbird. Length 6.3-6.9mm, wing length 4.8-5.5mm.

Female. Confirmed material not examined.

124 125 126

Figs 124-126. ***Pipizella mongolorum*** **♂ (paralectotype): 124, left antenna, lateral view; 125-126, genitalia: 125, dorsal view; 126, lateral view.**

Pipizella nataliae Kuznetzov, 1990a: 16.

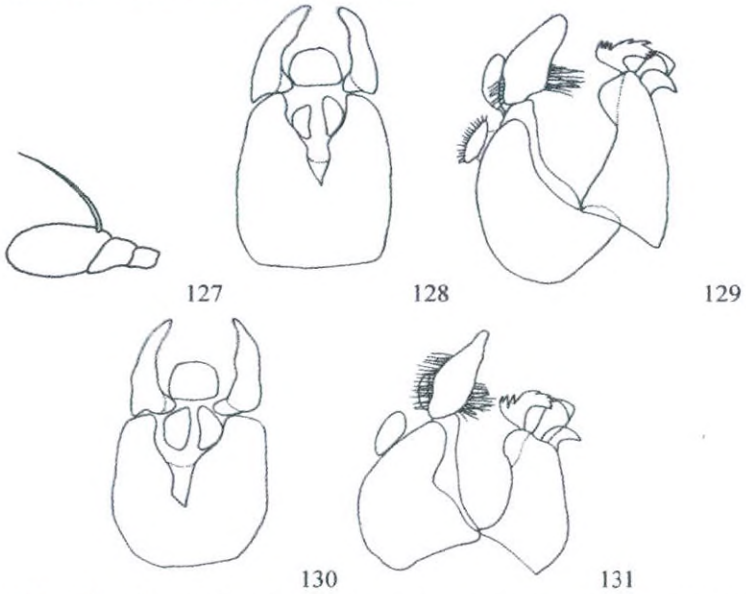
Type material. One male paratype was studied by the first author: **Russia**: USSR, Central Caucasus, Northern Ossetia, Cej canyon of the r. Cejdon, northern slope of Kalper mountain, ridge cone, 1850m, 29.vi.1984, leg. S. Yu. Kuznetzov, coll. ZIAS.

Other material. Turkey: Erzurum, Naman, Kireçli Dağl, 2200m, 1.vii.2000, DNA voucher specimen S 352 G. Ståhls, FMNH; 1♂, leg. Ö. Çalmaşur, coll. CCF.

Description. Male. Head: ratio of width of face and width of head 1:2.6; ratio of length of eye contiguity and length of the frons 1:5.0; setae on eyes short (0.09mm) and dark; postpedicel 1.7 times longer than wide (Fig. 127), arista entirely dark. Wing: entirely covered with microtrichia. Legs: predominantly black, at most knees yellow; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 2.0 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.5 times longer than tibial width; setae on femora yellow. Abdomen: setae predominantly yellow, black setae present on posterior margins of tergite II and III, sternite VIII with yellow setae; tergite II 1.7 times wider than long, 1.18 times longer than tergite III, and 1.06 times longer than tergite IV; tergite IV 1.8 times longer

than sternite IV. Genitalia (Figs 128-131): epandrium small, without arms; surstylus similar to that of *P. viduata*; post-anal hood circular; hypandrium with relatively large upper process; upper gonocercus cockscomb-shaped with 7 teeth; lower gonocercus hook-shaped. Length 6.3mm, wing length 4.6mm.

Female. Confirmed material not examined.



Figs 127-131. ***Pipizella nataliae*** ♂**: 127, left antenna (paratype), lateral view; 128-129, genitalia (paratype): 128, dorsal view; 129, lateral view; 130-131, genitalia (Turkey): 130, dorsal view; 131, lateral view.**

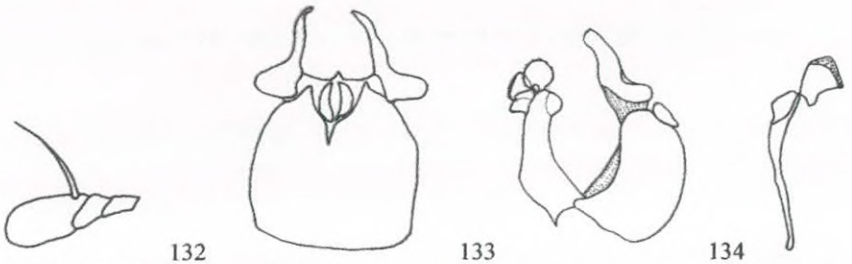
Pipizella nigriana (Séguy, 1961:16).

Type material. The lectotype male was studied by the second author: **France**: Hautes Alpes, Lautaret, 15.vii., des. J.A.W. Lucas, coll. MNHN.

Other material. Austria, France, Italy, Liechtenstein, Switzerland.

Description. Male. Head: ratio of width of face and width of head 1:2.7-2.8; eyes not coalescent; setae on eyes white and dark, 0.09 mm long; postpedicel 1.6-1.8 times longer than wide (Fig. 132), arista dark. Wing: entirely covered with microtrichia. Legs: predominantly black, coloured as in *P. maculipennis*; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.9-2.0 times longer than second tarsomere; setae on femora yellow; setae on posterolateral surface of hind tibia 1.2-1.4 times longer than tibial width. Abdomen: with black and white setae, pregenital segment with white setae; tergite II 1.9-2.1 times wider than long, 1.09-1.17 times longer than tergite III, 0.89-1.00 times longer than tergite IV; tergite IV 1.5-1.8 times longer than sternite IV. Genitalia (Figs 133-135): epandrium in dorsal view squarish, with narrow collar; hypandrium resembling *P. annulata*, upper process semicircular; upper gonocercus a circular plate; lower gonocercus quadrate, with serrated dorsal and lateral margin. Length 5.2-7.4mm, wing length 3.5-5.0mm.

Female. Confirmed material not examined.



Figs 132-135. ***Pipizella nigriana*** **♂: 132, left antenna, lateral view (Switzerland); 133-135, genitalia (France): 133, dorsal view; 134. lateral view; 135, aedeagus, lateral view.**

Pipizella pennina (Goeldlin de Tiefenau, 1974: 239).

Pipizella microapicalis Lucas, 1976: 9, **syn. n.**

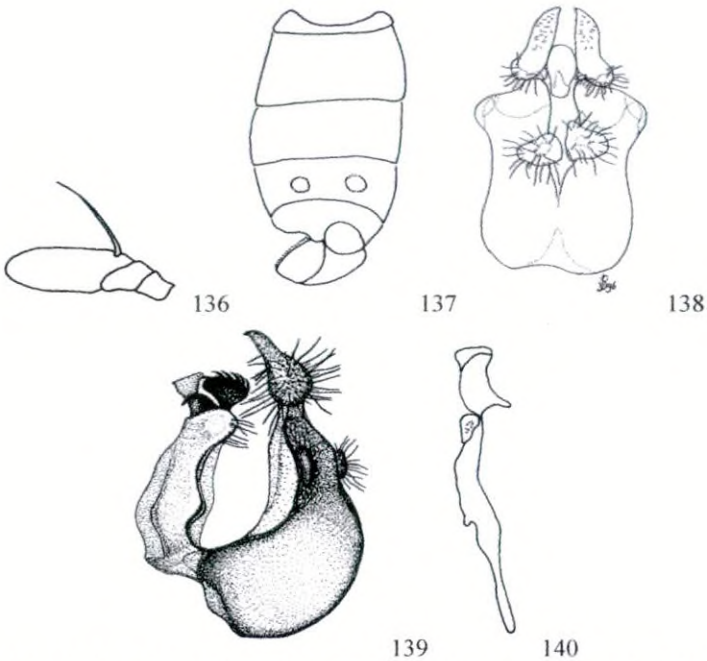
Type material. No type material of *P. pennina* was studied. Based on the description of *P. pennina* and the type material of *P. microapicalis* these species are conspecific. The holotype male of *P. microapicalis*: **Switzerland**: Engadin, Bergun, 1400m, 6.vii.1968, leg. J.A.W. Lucas, coll. ZMA and 27 paratypes (coll. ZMA; IAG; MNHN; ZSM) of *P. microapicalis* were studied by the second author.

Other material. Belgium: Gileppe, 5.vii.1987, 1♂, leg. J. van Steenis, coll. ZMA; **The Netherlands**: Maastricht, St Pietersberg, 1♂, leg. J. van Steenis, coll. JSA. Material from France, Italy, Spain, and Switzerland was also studied; **France**: Dept Var, 300m, Rocbaron, 22.v.2001, 1♂, leg. & coll. G. v/d Weyer, DNA Voucher specimen No S 342, G. Ståhls, FMNH.

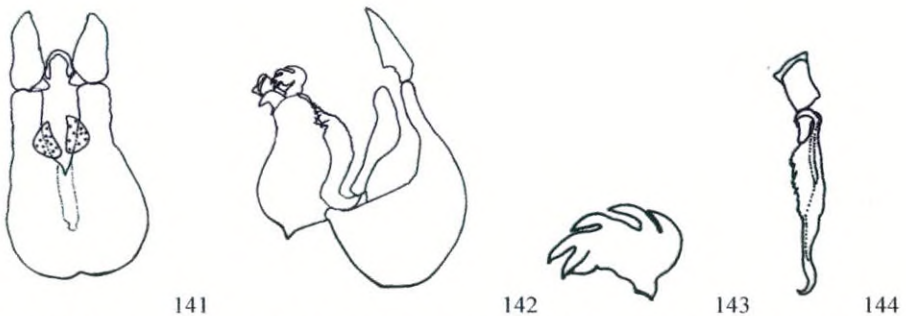
Description. Male. Head: ratio of width of face and width of head 1:2.3-2.6; anterior half of frons with black setae; ratio of length of eye contiguity and length of the frons 1:1.7-2.1; setae on eye predominantly white, mixed with dark setae on dorsal half, 0.09mm long; postpedicel 2.1-2.5 times longer than wide (Fig. 136), arista dark. Wing: entirely covered with microtrichia. Legs: black, only front and mid tibia yellow on apical 1/3; basitarsus of mid tarsi entirely covered with yellow bristles, slightly compressed posteriorly, 1.7-1.9 times longer than second tarsomere; setae on apical half of front femur black; setae on posterolateral surface of hind tibia mixed black and yellow, 1.4-1.6 times longer than tibial width. Abdomen: with black and white setae, pregenital segment with yellow and black setae; tergite II 1.9-2.1 times wider than long, 1.08-1.19 times longer than tergite III, and 0.93-1.03 times longer than tergite IV; tergite IV 1.6-1.8 times longer than sternite IV; sternite IV with two round elevations (Fig. 137). Genitalia (Figs 138-140): epandrium in lateral view with large and wide base and narrow apical part and in dorsal view with wide shoulders; surstylus relatively small; post-anal hood elongate-oval shaped; hypandrium with narrow inner median flange, and rounded apical process; upper gonocercus with seven teeth; lower gonocercus hook- shaped. Length 6.0-7.6mm, wing length 4.3-5.4mm.

Female. Confirmed material not examined.

Discussion. The specimen from Belgium was mentioned by Verlinden (1999) without seeing the actual specimen and without giving any reference. Marcos García (1985) mentioned *P. microapicalis* as a commonly accepted synonym of *P. pennina*, but did not formally synonymise these two taxa.



Figs 136-140. *Pipizella pennina* ♂ **(France): 136, left antenna, lateral view; 137, sternites; 138-140, genitalia: 138, dorsal view; 139, lateral view; 140, aedeagus, lateral view.**



Figs 141-144. *Pipizella richterae* **(after Kuznetzov 1990b), genitalia: 141, dorsal view; 142, lateral view; 143, upper gonocercus; 144, aedeagus, lateral view.**

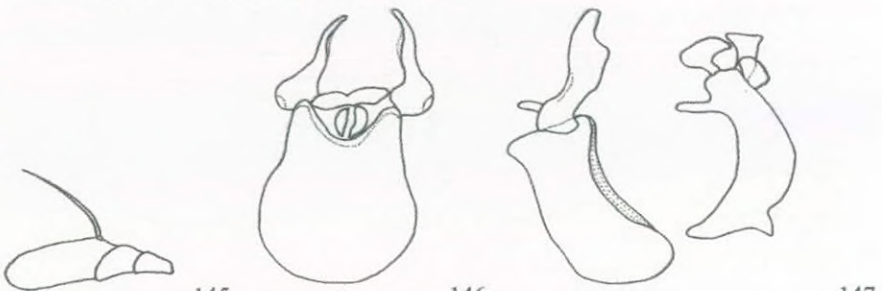
Pipizella siciliana Nielsen & Torp, 1973: 297.

Type material. One male paratype was studied by the first author: **Italy**: Sicilia, Troina, Lago di Ancipa 900m, 4.v.1968, leg. S. Langemark, coll. UZMC.

Other material. **Italy**: Sicilia, Taormina, 18.iv.1976, 1♂; ibid, 19.iv.1976, 2♂, all leg. J.A.W. Lucas, coll. ZMA.

Description. Male. Head: ratio of width of face and width of head 1:2.4-2.6; postpedicel 1.8-2.3 times longer than wide (Fig. 145), arista light on basal 1/4-1/3; ratio of length of eye contiguity and length of the frons 1:2.2-2.3; setae golden yellow, on eyes somewhat darker and 0.13mm. Wing: first basal cell covered over 80% with microtrichia. Legs: yellow and black, basitarsus of front and mid tarsi and sometimes second tarsomere of mid tarsi yellow, basal 1/6 of front and mid tibia yellow; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.7-1.8 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.7-2.0 times longer than width of tibia; setae on femora yellow. Abdomen: setae yellow and black, sternite VIII with yellow setae; tergite II 1.7-1.9 times wider than long, 1.06-1.13 times longer than tergite III, and 0.93-1.03 times longer than tergite IV; tergite IV 1.8-1.9 times longer than sternite IV. Genitalia (Figs 146, 147) similar to *P. thapsiana* and *P. zloti*; surstylus long and straight; angle of epandrium near cerci about 90°; epandrium with arms, epandrial rim prominent. Length 6.6-8.0mm, wing length 4.6-5.8mm.

Female. Confirmed material not examined.



145 146 147

Figs 145-147. ***Pipizella siciliana*** **♂ (paratype): 145, left antenna, lateral view; 146-147, genitalia: 146, dorsal view; 147, lateral view.**

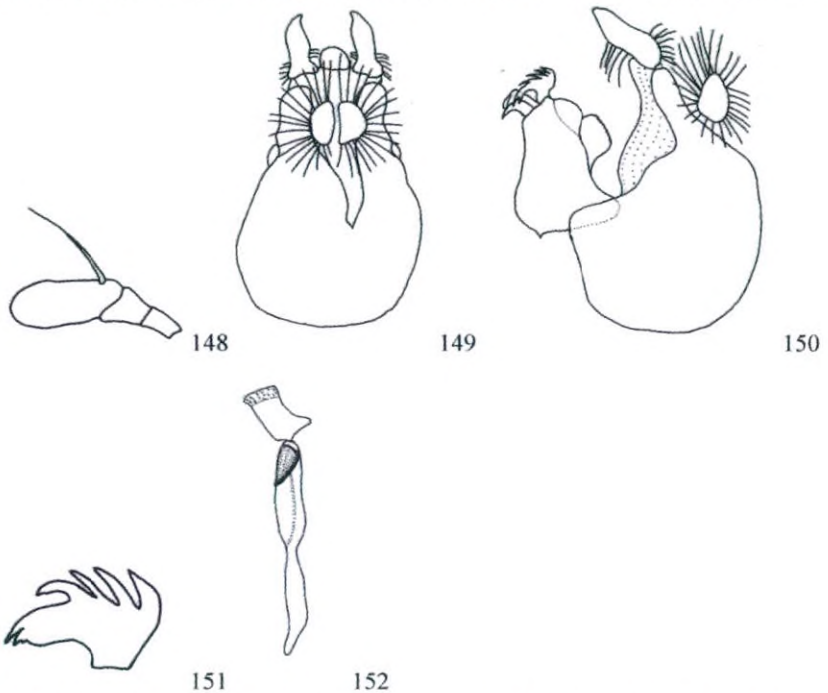
Pipizella speighti Verlinden, 1999: 13.

Type material. One paratype was studied by the first author: **France**: 05, 1500m, Chateauroux, Vallee Rabious, 29.v.1997, 1♂, leg. L. Verlinden, coll. CCF.

Other material. Andorra: Gorge San Antonio, 1150m, 26.vii.1955, 1♂, leg. V.S. v.d. Goot & Theowald, coll. ZMA; **France**: Ariège, Col de Pay, 1400m, 6.vii.1951, 1♂, leg. H. Teunissen, coll. ZMA; Pyr.Or., Gorge de Ségre, 3.vii.1989, 1♂, leg. "Zomerkurs", coll. ZMA; Briançon, 9.viii.1986, 1 ♂ leg. & coll. J. de Rond; **Italy**: Aosta, Entrèves, Mt. de la saxe, 1250m, 16.vii.1962, 2♂, exc. Amsterdam, coll. NAL; Aosta, Val Veni La Visalle, 1650m, 18.vii.1962, 1♂, exc. Amsterdam, coll. NAL; Aosta, Val Ferret La Vachey, 1600-1700m, 20.vii.1962, 1♂, exc. Amsterdam, coll. NAL; prov Aoste, Etroubles, 1180m, 6.vii.1999, 1 ♂, leg. & coll. G. v.d. Weyer, DNA voucher specimen No S 344, G. Ståhls, FMNH; **Switzerland**: Zermatt, 1600-1700m, 20/30.vii.1964, 7♂, leg. V.S. v.d. Goot & J.A.W. Lucas, coll. ZMA; ibid, 1 copula; Sankt Niklaus, 1100-1200m, 23 & 29.vii.1964, 1♂, leg. V.S. v.d. Goot & J.A.W. Lucas, coll. ZMA.

Description. Male. Similar to *P. viduata*. Head: ratio of width of face and width of head 1:2.5-2.8; ratio of length of eye contiguity and length of the frons 1:2.2-2.8; setae on eyes black and white, 0.07mm; frons with black setae on anterior 1/4-1/2; postpedicel 1.9-2.4 times longer than wide (Fig. 148), arista dark somewhat lighter on basal 1/5. Wing: entirely covered with microtrichia. Legs: colour and colour of setae as in *P. calabra*, sometimes even

basitarsus of mid tarsi yellow; basitarsus of mid leg entirely covered with yellow bristles, compressed (as in Fig. 66), 2.0-2.4 times longer than second tarsomere; setae on femora black and yellow; setae on apical half of front femur black; setae on apical 1/4-1/3 of mid and hind femur black, those on mid femur stouter than yellow setae; setae on posterolateral surface of hind tibia 1.2-1.5 times longer than tibial width. Abdomen: setae black and white, sternite VIII with black and white setae; tergite II 1.8-2.0 times wider than long, 1.07-1.22 times longer than tergite III, and 1.00-1.14 times longer than tergite IV; tergite IV 1.6-1.9 times longer than sternite IV. Genitalia (Figs 149-152) intermediate between *P. viduata* and *P. calabra*; the inner median flange of *P. speighti* is obviously serrated, in *P. viduata* and *P. calabra* it is at most finely and irregular serrated; upper gonocercus with seven teeth (see also under *P. calabra*, *P. cantabrica*, and *P. viduata*). Length 5.4-6.8mm, wing length 4.1-4.4mm.



Figs 148-152. ***Pipizella speighti*** **♂ (France): 148, left antenna, lateral view; 149-152, genitalia: 149, dorsal view; 150, lateral view; 151, upper gonocercus, lateral view; 152, aedeagus, lateral view.**

Female (taken *in copula*). Head: ratio of width of face over lunula and width of head 1:2.7; occiput and lunulae with predominantly black setae; frons with yellow setae and small triangular pollinose areas along eye margin; postpedicel 2.6 times longer than wide, arista yellow on basal 1/3. Wing: cell BM covered over 90% with microtrichia. Legs: yellow on apical 1/10 of all femora, front and mid tibiae yellow on apical 1/5-1/10 and basal 2/5, hind tibia yellow on basal 1/4, front tarsi with yellow basitarsus and mid tarsi with yellow basitarsus, second tarsomere and apical 1/3 of fifth tarsomere; basitarsus of mid tarsi entirely

covered with yellow bristles, cylindrical, 2.0-2.1 times longer than second tarsomere; setae on femora and tibiae yellow; setae on posterolateral surface of hind tibia 1.4 times longer than tibial width. Abdomen: setae predominantly yellow, some areas with black setae; tergite II 2.1-2.2 times wider than long, 1.07 times longer than tergite III, and 0.94 times longer than tergite IV. Length 6.7mm, wing length 4.9mm.

Discussion. Another species within the species complex of *P. viduata*. Lucas was not convinced about the status of these specimens, labelled by him as *P. alpestris*, and therefore they were not included as new species in his paper (Lucas 1976). Vujić (1997) referred to this species too. It is similar to *P. richterae* Kuznetzov, 1990b (Figs 141-144). As no type material of *P. richterae* was studied no conclusions will be drawn whether these species are conspecific.

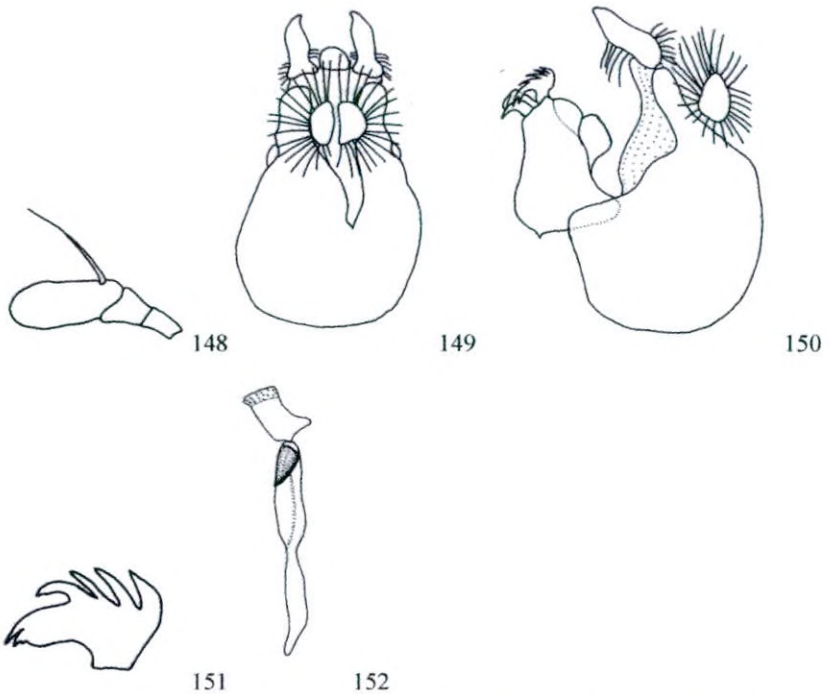
Pipizella thapsiana Kassebeer, 1995: 260.

Type material. Two paratypes were studied by the first author: **Morocco**: Marakech, Ouirgane 1000m, 26.iv.1994, 1♀, leg. C. Kassebeer, coll. UZMC; ibid, 27.iv.1994, 1♂, leg. C. Kassebeer, coll. UZMC.

Other material. **Portugal**: Monte Carvalho, near Portalegre 22.iv.1999 1♂, leg. & coll. MRL; Algarve, E of Quartiera, 24.iv,1985, 4♂, leg. J.A.W. Lucas, coll. ZMA; ibid, 25.iv.1985, 2♂; Algarve, Vilamoura, 27.iv.1985, 2♂, leg. J.A.W. Lucas, coll. ZMA; Algarve, N of Quartiera, 28.iv.1985, 1♂, leg. J.A.W. Lucas, coll. ZMA.

Description. Male. Head: ratio of width of face and width of head 1:2.7-2.9; ratio of length of eye contiguity and length of the frons 1:4.5-6.5; setae on eyes black and white (0.09mm); postpedicel about 1.6-1.7 times longer than wide (Fig. 153), arista dark. Wing: entirely covered with microtrichia. Legs: compared with *P. siciliana*, blacker; basitarsi predominantly black; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.5-1.7 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.5-1.7 times longer than tibial width; setae on femora yellow. Abdomen: setae yellow and black, sternite VIII with yellow setae; tergite II 1.6-1.8 times wider than long, 1.20-1.21 times longer than tergite III, and 0.97-1.03 times longer than tergite IV; tergite IV 1.6-1.9 times longer than sternite IV. Genitalia (Figs 154-157) similar to *P. siciliana* and *P. zloti*; angle of epandrium near cerci more than 90°; epandrium squarish, without arms; epandrial rim less prominent; surstylus short and more curved than in *P. siciliana*. Length 6.3-7.9mm, wing length 4.9-5.7mm.

Female. Head: ratio of width of face over lunula respectively over ocelli and width of head 1:2.7 and 1:3.9; frons with many black setae intermingled with white setae, with triangular pollinose areas along eye margin; postpedicel 1.5 times longer than wide, arista dark. Wing: cell BM covered over 90-95% with microtrichia. Legs: predominantly black, knees yellow and sometimes basitarsus of mid tarsi; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.9 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.7 times longer than tibial width. Abdomen: tergite II 1.8 times wider than long, 1.11 times longer than tergite III, and 1.00 times longer than tergite IV. Length 6.0mm, wing length 4.4mm.



Figs 153-157. ***Pipizella thapsiana*** ♂**: 153, left antenna, lateral view (paratype); 154-157, genitalia (Portugal): 154, dorsal view; 155, lateral view; 156, upper gonocercus; 157, aedeagus, lateral view.**

Pipizella viduata (Linnaeus, 1758: 598)

Pipiza campestris Fallén, 1817: 59, **syn. n.**
Pipiza varipes Meigen, 1822: 254 (syn. Thompson *et al.* 1982).
Pipiza obscuripennis Meigen, 1835: 119 (syn. Lucas 1976).
Pipiza tristis Meigen, 1838: 119 (syn. Lucas 1976).
Paragus nigritis Glimmerthal, 1842: 668 (syn. Kuznetzov 1987b).
Paragus fuscipennis Walker, 1849: 545 (syn. Thompson 1988).
Pipizella montana Šimić, 1987: 121 (syn. Vujić 1997).
Pipizella nigra Šimić, 1987: 122 (syn. Vujić 1997).

Type material. No type material of *P. viduata* was studied. The lectotype of *P. campestris* : handwritten "*Pipiza campestris* ♂"; 146, 76; Riksmuseum Stockholm; Lectotype Goeldlin et Lucas, desig. 22.XII.76 (coll. NRS) was studied, and found to be conspecific with *P. viduata*. The lectotype female of *P. varipes* was studied by the second author: Allemagne, no 1205, lectotype des. J.A.W. Lucas, coll. MNHN. The lectotype male of *P. tristis* was studied by the second author: Allemagne, lectotype des. J.A.W. Lucas, coll. MNHN. The lectotype male of *P. obscuripennis* was studied by the second author: no 1207, lectotype des. J.A.W. Lucas, coll. MNHN. The holotype male of *P. montana* was studied by the first author: H-71; 059, Durmitor, Reka Bukovika, 28.viii.1984 (not 21.viii.1984 as in the original publication pers.

comm. Vujić), coll. IBEN, Genitalia glued on a separate glass slide "H-71 montana", and found conspecific with *P. viduata*. The holotype male of *P. nigra* was studied by the first author: H-67; 059, Durmitor, Reka Bukovika, 28.viii.1984, coll. IBEN, Genitalia glued on a separate glasslide "H-67 nigra", and found conspecific with *P. viduata*. No type material of *P. fuscipennis* was studied by us, nor by Thompson (Thompson 1988) who made it a possible synonym of *P. viduata*.

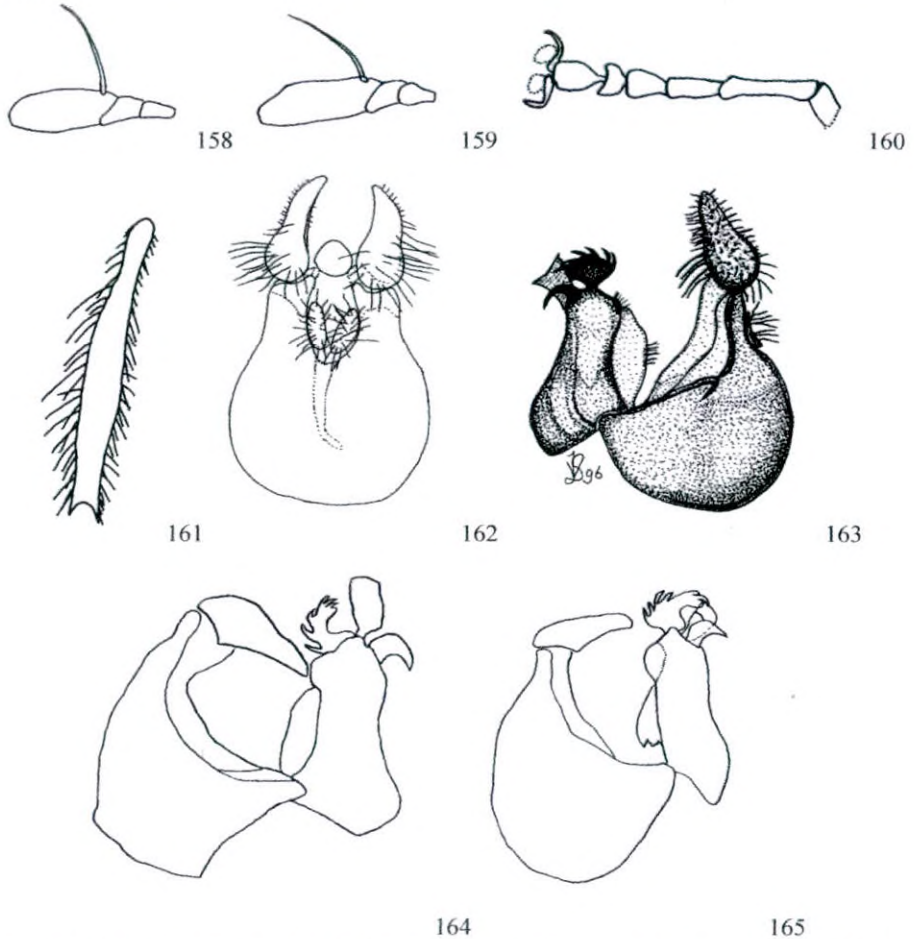
Other material. Specimens were seen from nearly all European countries. **Russia**: Новосибирск (Novosibirsk), 16.vi.1979, 1 ♂, leg. Н. Виолович coll. TNS; Новосиб (Novosib.)., обл., окр., Карасука, 6.vi.1982, leg. А. Баркалов, coll. TNS; Алтай (Altai), охр., Карасука, 10.vii.1964, 1♂, leg. Афанасвой, coll. TNS; **Algeria**: Rocher Blanc, 1♂, leg. J. Surcoef, coll. ZMA. No records from Turkey were available.

Description. Male. Head: ratio of width of face and width of head 1:2.4-2.7; ratio of length of eye contiguity and length of the frons 1:2.3-3.2; frons with black setae near lunulae; setae on eyes black and white, sparse 0.05-0.07mm long; postpedicel 2.1-2.5 times longer than wide (Fig. 158), arista light on basal 1/4-1/3. Wing: entirely covered with microtrichia. Legs: with black and yellow colour, femora yellow on apical 1/10, front and mid tibiae yellow on basal 2/5 and apical 1/10, hind tibia yellow on basal 1/6, basitarsus of mid tarsi and sometimes basitarsus of front tarsi yellow; basitarsus of mid tarsi (Fig. 160) entirely covered with yellow bristles, less compressed as in *P. calabra* and *P. speighti*, 1.8-2.2 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.3-1.5 times longer than tibial width (Fig. 161); setae on femora black and yellow; front femur with black setae on apical half, mid femur with black setae on apical 1/3. Abdomen: setae including on sternite VIII black and white; tergite II 1.8-2.2 times wider than long, 1.18-1.25 times longer than tergite III, and 0.95-1.00 times longer than tergite IV; tergite IV 1.2-1.5 times longer than sternite IV. Genitalia (Figs 162-165) similar to *P. speighti* and *P. calabra*; epandrium with arms and slightly larger than hypandrium; surstylus relatively large; cerci with short setae, less than twice as long as cerci; post-anal hood semi triangular; hypandrium with wide base; inner median flange of hypandrium widest in medial part and reaching over the basal half of the hypandrium; lower gonocercus hook-shaped; upper gonocercus cockscomb-shaped, with seven teeth. Length 4.8-7.2mm, wing length 3.8-5.5mm.

Female (taken *in copula*). Head: ratio of width of face over lunula and width of head 1:2.5; frons with many black setae intermingled with white setae, without pollinose areas; postpedicel 2.3-2.5 times longer than wide, arista yellow on basal 2/3. Wing: cell BM covered over 90-95% with microtrichia. Legs: predominantly black, apical 1/10 of femora yellow, front and mid tibiae yellow on basal 2/5 and apical 1/20, hind tibia yellow on basal 1/6, basitarsus of front tarsi and basitarsus and second tarsomere of mid tarsi yellow; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.8 times longer than second tarsomere; front femur with black setae on apical 1/6, other setae yellow; setae on posterolateral surface of hind tibia 1.2 times longer than tibial width; tergite II 1.9 times wider than long, 1.22 times longer than tergite III, and 0.88 times longer than tergite IV. Length 5.8mm, wing length 4.1mm.

Discussion. This species appears in some literature as *P. varipes* (Meigen 1822), partly because not all authors share the opinion of Thompson *et al.* (1982), who synonymised *P. varipes* with *P. viduata*. *Pipizella varipes* is, in any case, a junior synonym of *P. campestris*. Even if we belong to "not all authors" we adopt the name *P. viduata* for the species described as *P. campestris* for stabilisation of the nomenclature. One aberrant female (**Croatia**: 10km ZZO (N?) Ovska, 45'15''N 17' 03''O, 17.viii.1963, 1 copula, leg. "Leiden", coll. ZMA) was found with elongate postpedicel: 2.7 times longer than wide (Fig. 159), indicating that

antennal deformations occur now and then (see also under *Pipizella virens* var. *sacculata* Becker).



Figs 158-165. ***Pipizella viduata*: 158, left antenna, lateral view (Yugoslavia ♂); 159, left antenna, lateral view (aberrant ♀, Yugoslavia); 160, left mid tarsus, dorsal view (Sweden ♂); 161, left hind tibia, dorsal view (Sweden ♂); 162-163, genitalia (The Netherlands ♂): 162, dorsal view; 163, lateral view; 164, genitalia (holotype *P. montana*), lateral view; 165, genitalia (holotype *P. nigra*), lateral view.**

Pipizella virens (Fabricius, 1805: 186)

Pipiza interrupta Haliday, 1833: 165 (syn. Peck 1988).

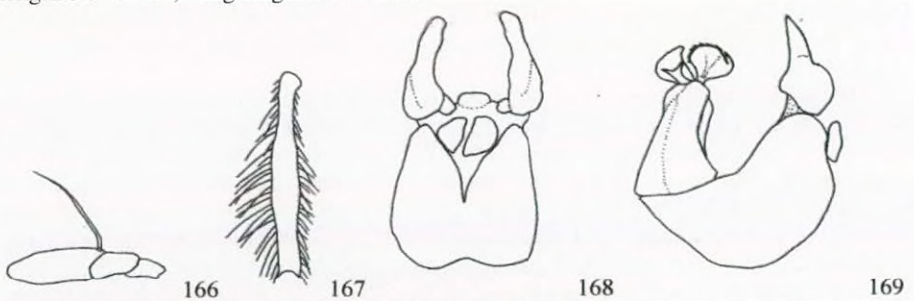
Pipiza morosa Loew, 1840: 29 (syn. Peck 1988).

Type material. The male lectotype of *P. virens* was studied by the second author; 1203 and lectotype des. J.A.W. Lucas, coll. MNHN. Unfortunately no type material could be traced in

ex coll. Fabricius (coll. UZMC) and it should be regarded as lost (R. Meier *pers. comm.*). We see no need to designate a Neotype as the species is well known by all authors. The types of *P. interrupta* were not studied. They could be stored in the following museums: La Specola (Florence); Natural History Museum (Turin); Vienna, or Humboldt Museum (Berlin). The type material of *P. morosa* in coll. MNB is presumed to be lost (H. Wendt *pers. comm.*).

Other material. Turkey: prov. Kars, 8km W Sarikamiş, 2000m, 7.vii.1986, 1♂, leg. J.A.W. Lucas, coll. ZMA. Material from Belgium, France, Germany, the Netherlands, and Romania was also studied.

Description. Male. Head: ratio of width of face and width of head 1:2.3-2.6; ratio of length of eye contiguity and length of the frons 1:1.9-2.3; setae on eyes white and dark, 0.09mm; postpedicel 2.5-2.7 times longer than wide (Fig. 166), arista yellow at basal half to basal 2/3. Wing: entirely covered with microtrichia. Legs: colour as in *P. maculipennis*, often also second tarsomere of mid tarsi yellow; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.8-1.9 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.8-2.2 times longer than tibial width (Fig. 167), on anterolateral surface predominantly black; setae on front femur black on apical 1/6-1/4. Abdomen: setae black and white, pregenital segment with white setae; tergite II 1.6-1.8 times wider than long, 1.13-1.27 times longer than tergite III, and 1.06-1.13 times longer than tergite IV; tergite IV 1.4-1.7 times longer than sternite IV. Genitalia (Figs 168, 169): epandrium relatively small; surstylus, in lateral view with wide base and very narrow apex, in dorsal view nearly straight; post-anal hood a small rectangle; hypandrium straight with narrow inner median flange; upper gonocercus with one large tooth; lower gonocercus T-shaped. Length 6.8-7.4mm, wing length 4.8-5.4mm.



Figs 166-169. ***Pipizella virens*** **♂: 166, left antenna, lateral view (The Netherlands); 167, left hind tibia, dorsal view (Turkey); 168-169, genitalia (The Netherlands): 168, dorsal view; 169, lateral view.**

Female. Very similar to male. Tergite II rather narrow, wings clear, elongate postpedicel, more yellow legs and long setae on hind tibia will separate this species from *P. maculipennis* and *P. viduata*.

Discussion. Loew (1840) stated in his description of *P. morosa* that the wings have a dark patch on the middle "alis infuscatis", a character not found in *P. virens*. In the genus *Pipiza*, Loew (1840) included 13 species: *festiva*, *ornata*, *noctiluca*, *signata*, *bimaculata*, *quadrimaculata*, *austriaca*, *virens*, *annulata*, *morosa*, *varipes*, *atra*, and *acuminata*. As Loew (1840) did not include *P. maculipennis* it is more likely that *P. morosa* is a junior synonym of *P. maculipennis*. We decided not to change the synonymy as no type material of *P. morosa* was found.

From the original description of *P. interrupta* (Haliday, 1833) it is clear that Haliday had the wrong species concept of *P. virens*: *P. interrupta* is "half the size of the small variety of *P. virens*...body is much less pubescence....third joint of the pedicel more oblong". More likely is that Haliday's *P. virens* belongs to *Neocnemodon*, and that *P. interrupta* could be *Pipizella viduata*. As no type material was studied no conclusions will be drawn here.

Pipizella virens var. ***sacculata*** Becker, 1921: 11.

Pipizella beckeri Brădescu, 1986: 124 (syn. Dirickx *et al.* 1996).

Type material. The female lectotype (hereby designated), coll. MNB, was studied by the first author, bearing the following labels: 1) white label " Zermatt 25/7 19392"; 2) white label "virens var sacculata Beck; 3) white label "sacculata det. Becker", and 4) red label "Lectotype ♀ *Pipizella virens* var. *sacculata* Becker, 1921, des. J. van Steenis, 2003".

Other material. No other material was studied.

Description. Male. Not recognised.

Female. Setae predominantly light yellow, on posterior half of frons a band of black setae, and some black setae near the lunulae; length of setae on face and longest setae of hind femur 0.20mm, on eyes 0.09mm, posterior of ocelli 0.38mm, and on mesonotum 0.16mm. Head: width of face compared to width of head (measured over lunulae) 11:29; width of face at mouth edge, lunule and ocelli 21:22:15; distance between posterior ocelli 0.13mm and between posterior and anterior ocellus 0.09mm. Wing: infuscated in the middle, with bare areas of microtrichia on first and second basal cell and, most likely worn, on posterior cell; the line through vein rm passing proximally from the point were Sc reaches wing margin. Haltere yellow. Legs: black with yellow markings: front leg with yellow knee and basal 1/6 of tibia, mid leg with yellow knee and basal 1/3 of tibia, hind leg with yellow knee; basitarsus of mid leg not compressed; basitarsus of hind leg swollen. Length 6.2mm, wing length 4.7mm.

Discussion. Only three females are known (Becker 1921; Brădescu 1986; Verlinden 1996) which share the characteristic deformation of the pedicel (Fig. 170). The species was described as a variety of *Pipizella virens* and Sack (1932) concluded that the pedicel would be an abnormality. Brădescu (1986) found a second female and raised it to species level, as the pedicel were perfectly symmetrical. Verlinden (1996) mentioned that he never had seen any deformation in *Pipizella* and could not decide whether *P. sacculata* is a good species. In the material studied here two females (*P. lyneborgi* and *P. viduata*) were found with different but symmetrical deformities. Most likely *P. sacculata* is conspecific with one of the species dealt with here. In most cases the females remain unidentifiable and no conclusion will be drawn here.

Fig. 170. *Pipizella virens* var. *sacculata* ♀ (Lectotype), left antenna, lateral view.

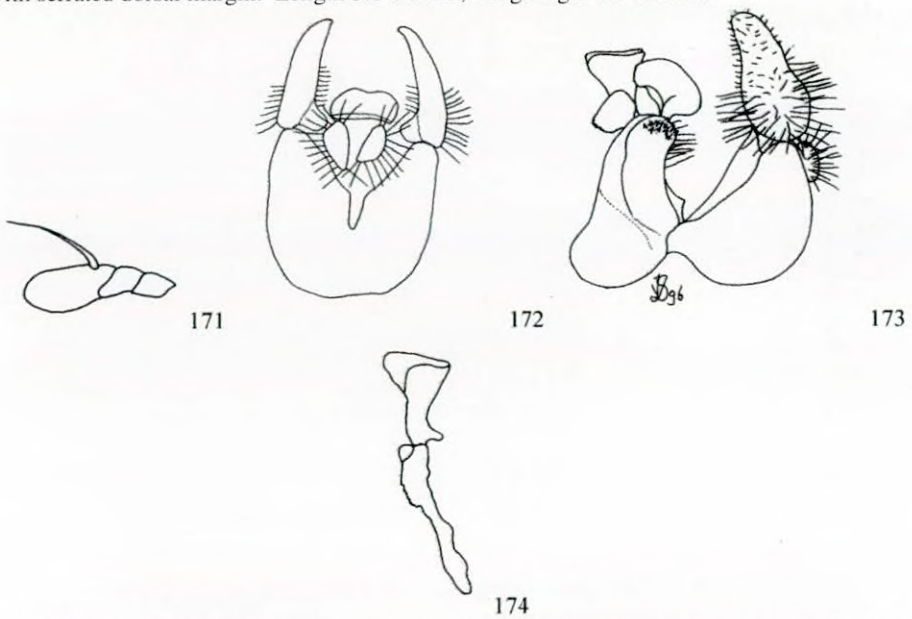
Pipizella zeneggenensis (Goeldlin de Tiefenau, 1974: 239).

Pipizella lata Lucas, 1976: 9 (syn. Lucas 1976).

Type material. No type material of *P. zeneggenensis* was studied. The holotype ♂ of *P. lata*: **Spain**: Gerona, Setcasas, 1400-1500m, 15.vii.1970, leg. J.A.W. Lucas, coll. ZMA; allotype female and 54 paratypes (coll. ZMA; IAG; MNHN; ZFAK) were studied by the second author.

Other material. Material from Belgium, France, Germany, Italy, the Netherlands, and Spain was studied; **Spain**: Segovia, La Granja, 40°54'00"N 04°00'00" W, 8.vi.2001, 1♂, leg. & coll. AET, DNA Voucher specimen No S 345, G. Ståhls, FMNH.

Description. Male. Head: ratio of width of face and width of head 1:2.7-2.9; ratio of length of eye contiguity and length of the frons 1:3.4-5.0 (7.4); setae on eyes black and white, 0.09mm; postpedicel 1.9-2.4 times longer than wide (Fig. 171), arista dark. Wing: entirely covered with microtrichia. Legs: black with yellow on basal 1/3 of front and mid tibia; basitarsus of mid tarsi entirely covered with yellow bristles, cylindrical, 1.8-2.0 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.6-1.8 times longer than tibial width; setae on femora yellow. Abdomen: setae predominantly yellow, some black setae along posterior margin of tergite II and III, some specimens have the entire anterior margin of tergite IV with black setae; sternite VIII with yellow seta; tergite II 1.9- 2.2 times wider than long, 1.07-1.17 times longer than tergite III, 0.88-1.00 times longer than tergite IV; tergite IV 1.3-1.5 times longer than sternite IV. Genitalia (Figs 172-174): epandrium small, as long as surstylus; post-anal hood a wide plate with curved dorsal margin; hypandrium relatively large, with wide base and dentate apical surface; upper gonocercus an oval plate with some very small teeth; aedeagus relatively wide and long; lower gonocercus squarish with serrated dorsal margin. Length 5.8-6.9mm, wing length 4.3-5.0mm.



Figs 171-174. ***Pipizella zeneggenensis*** **♂: 171, left antenna, lateral view (paratype *P. lata*); 172-174, genitalia (France): 172, dorsal view; 173, lateral view; 174, aedeagus, lateral view.**

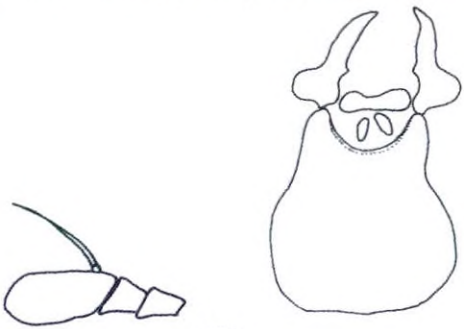
Female. Confirmed material not examined.

Pipizella zloti Vujić, 1997: 58.

Type material. The following paratypes were studied: **Croatia**: Dubasnica, Demizlok, 14.v.1994, 1♂, leg. Vujić; Dubasnica, Malinik, 3.vi.1995, 1♂, leg. Vujić; Dubasnica, Klisura Lazareve reke, 29.iv.1995, 1♂, leg. Vujić, all coll. IBEN.

Other material. No other material was studied.

Description. Male. Head: ratio of width of face and width of head 1:2.6-2.8; ratio of length of eye contiguity and length of the frons 1:2.1-2.4; setae on eyes 0.13mm long with black setae on dorsal 1/3, and brown setae; postpedicel 1.7-2.1 times longer than wide (Fig. 175), arista dark. Wing: first basal cell covered over 95% with microtrichia. Legs: black with front and mid tibia yellow on basal 1/8-1/4, basitarsus of front and mid tarsi yellow; basitarsus of mid tarsi entirely covered with yellow setae, cylindrical, 1.8-2.0 times longer than second tarsomere; setae on posterolateral surface of hind tibia 1.7-2.0 times longer than tibial width setae on femora yellow. Abdomen: setae black and white, sternite VIII with white setae; tergite II 1.8-1.9 times wider than long, 1.12-1.19 times longer than tergite III, 0.97-1.07 times longer than tergite IV; tergite IV 1.6-1.7 times longer than sternite IV. Genitalia (Figs 176-178) similar to *P. siciliana* and *P. thapsiana*; upper lateral corner of epandrium more than 90°; surstylus with rounded apicomedial corner, more than 90°; epandrium with arms and narrow rim; surstylus elongate. Length 6.5-6.9mm, wing length 5.1-5.3mm.



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Figs 175-178. *Pipizella zloti* **(paratype): 175, left antenna, lateral view; 176-178, genitalia: 176, dorsal view; 177, lateral view; 178, aedeagus, lateral view.**

Female. Confirmed material not examined.

Key to males

1 Lower gonocercus hook-shaped (Figs 2, 15, 31, etc.) **2**
Lower gonocercus otherwise (Figs 5, 11, 25, etc.) **12**

2 Epandrium with shoulders (Figs 3, 57, 98, and 138), without arms **3**
Epandrium without shoulders, epandrial arms can be present (Figs 1, 4, 9, 14 etc.) **5**

3 Epandrium in lateral view semicircular; surstylus small, triangular; cerci elongate (Figs 98, 99); eye contiguity long (1:2.0-2.5); tergite IV very long, 2.0-2.3 times longer than sternite IV; sternite IV without modifications ..... ***divicoi*** (Goeldlin)
Epandrium with much broader base than apex; surstylus irregular in shape; cerci of an irregular triangular shape (Figs 57, 58, 138, 139); eye contiguity very long (1:1.7-2.1); tergite IV long, 1.6-1.8 times longer than sternite IV; sternite IV with modifications (Figs 56, 137) **4**

4 Epandrium with wide shoulders, in lateral view with semicircular base; post-anal hood widest at apex; hypandrium with curved inner outline (Figs 138, 139); sternite IV with two, clearly separated, round elevations with bristles (Fig. 137) ..... ***pennina*** (Goeldlin)
Epandrium with small shoulders, in lateral view with triangular base; post-anal hood widest at base; hypandrium with straight inner outline (Figs 57, 58); sternite IV medially with two rounded elevations fused together, with short bristles (Fig. 56) ..... ***bispina*** Šimić

5 Hypandrium without inner median process (Figs 49, 129, and 131); epandrial arms missing (Figs 48, 128, 130) **6**
Hypandrium with inner median process (Figs 2, 15, 31, etc.); epandrial arms present (Figs 1, 14, 30, etc.) **7**

6 Epandrium relatively small, about the same size as the hypandrium, in dorsal view squarish; lower gonocercus with straight dorsal margin; post-anal hood semicircular (Figs 128-131); postpedicel short, 1.7 times longer than wide (Fig. 127); eye contiguity very short (1:5.0) ..... ***nataliae*** Kuznetzov
Epandrium larger than hypandrium, in dorsal view rectangular; lower gonocercus with toothed dorsal margin; post-anal hood trapezoid (Figs 48-50); postpedicel moderately long, 2.0-2.4 times longer than wide (Fig. 47); eye contiguity very long (1: 1.8) ..... ***barkalovi*** Violovitsh

7 Inner median process of hypandrium widest at base and confined to the basal half of the hypandrium (Figs 2, 15, and 31) **8**
Inner median process of hypandrium widest in medial part and extending beyond the basal half of the hypandrium (Figs 68, 150, and 163-165) **10**

8 Cerci elongate; epandrium large, much larger than hypandrium; epandrial arms long, about half the length of the epandrium (Figs 1, 2, 72); tergite IV very long, 2.0-2.3

times longer than sternite IV; sternite IV with sharp median keel (Fig. 71) ..... ***cantabrica*** Claussen
Cerci short; epandrium relatively small, only slightly larger than hypandrium; epandrial arms short, about one third of the length of the epandrium (Figs 14, 15, 30, 31); tergite IV short, 1.7 times longer than sternite IV; sternite IV medially without modifications **9**

9 Hypandrium with wide base; post-anal hood triangular (Figs 14, 15); tibia III with short setae, 1.3 times longer than tibia III wide (Fig. 13) ..... ***obscura*** Van Steenis & Lucas
Hypandrium straight; post-anal hood semicircular (Figs 30, 31); tibia III with long setae, 1.8 times longer than tibia III wide (Fig. 29) ... ***vandergooti*** Van Steenis & Lucas

10 Epandrium slightly larger than hypandrium; surstylus relatively large, about 1/3 of the hypandrial height; cerci with setae, that are about 1.5 times as long as cerci; inner median process of hypandrium rectangular (Figs 162-165) ..... ***viduata*** (Linnaeus)
Epandrium much larger than hypandrium; surstylus relatively small, a quarter to a fifth of the hypandrial height; cerci with setae, that are at least twice as long as cerci; inner median process of hypandrium squarish or semicircular (Figs 67, 68, 149, 150) **11**

11 Epandrial base about twice the size of the hypandrium; cerci with setae, that are twice as long as cerci; inner median process of hypandrium squarish, with obviously serrated margin (Figs 149, 150) ..... ***speighti*** Verlinden
Epandrial base much larger than hypandrium; cerci with setae, that are much longer than twice the length of the cerci; inner median process of hypandrium semicircular, with slightly serrated margin (Figs 67, 68) ..... ***calabra*** (Goeldlin)

12 Lower gonocercus squarish to rectangular-shaped (Figs 25, 26, 35, 39, etc.) **13**
Lower gonocercus otherwise (Figs 5, 6, 11, 76-79, 90, etc.) **27**

13 Hypandrium with elongate upper process (Figs 25, 26, 39, 40, etc.) **14**
Hypandrium with short, wide, triangular upper process, or with hardly visible upper process (Figs 35, 45, 53, 113, etc.) **21**

14 Surstylus in lateral view widely oval, widest in apical half (Figs 64, 84, 87) **15**
Surstylus in lateral view widest at base, gradually becoming narrower towards apex, or curved and with smallest part at apex (Figs 25, 39, 40, 107, 147, etc.) **16**

15 Post-anal hood broadly spoon shaped; epandrium in dorsal view with rounded corners; upper hypandrial process broadly triangular (Figs 83-85); eye contiguity short (1:2.8-3.5) (Fig. 81); postpedicel moderately long, 1.9-2.3 times longer than wide (Fig. 82); mid tarsi with tarsomeres 1 and 5 yellow ..... ***certa*** Violovitsh
Post-anal hood narrowly triangular; epandrium in dorsal view rectangular; upper hypandrial process triangular, with concave dorsal margin (Figs 63, 64); eyes at most touching at one point (Fig. 61); postpedicel short, 1.5 times longer than wide (Fig. 62); mid tarsi, at most, with tarsomere 1 yellow ..... ***brevis*** Lucas

16 Surstylus in lateral view widest at base, gradually becoming narrower towards apex; post-anal hood triangular (Figs 24, 25, 38-40, 106, 107) **17**

Surstylus curved; post-anal hood formed like a small rectangular plate with two humps (Figs 146, 147, 154, 155, 176, 177) **19**

17 Epandrium very wide, upper-medial corner angled (Figs 24, 25); wing base with veins yellow ..... ***orientalis*** Van Steenis & Lucas
Epandrium narrower, with curved upper-medial corner (Figs 38-40, 106, 107); wing base with veins dark-brown to black **18**

18 Medial area of surface of epandrium flat (Figs 38-40); wing cell BM entirely covered with microtrichia; setae on hind tibia short, 1.3-1.5 times longer than tibia III wide (Fig. 37) ..... ***annulata*** (Macquart)
Medial area of surface of epandrium curved (Fig. 106, 107); about 95% of wing cell BM covered with microtrichia; setae on hind tibia long, 1.7 times longer than tibia III wide ..... ***inversa*** Violovitsh

19 Upper lateral corner of epandrium making an angle of more than 90°; surstylus with rounded apicomedial corner, making an angle of more than 90°; epandrium with or without arms and narrow rim (Figs 154, 155, 176, 177); eye contiguity long (1:2.1-2.4) or very short (1:4.5-6.5); more than 95% of wing cell BM covered with microtrichia **20**
Upper lateral corner of epandrium making an angle of 90°; surstylus with sharp apicomedial corner, making an angle of 90°; epandrium with arms and wide rim (Figs 146, 147); eye contiguity long (1:2.2-2.3); about 80% of wing cell BM covered with microtrichia ..... ***siciliana*** Nielsen & Torp

20 Epandrium without arms, squarish (Fig. 154, 155); eye contiguity very short (1:4.5-6.5); wing cell BM entirely covered with microtrichia ..... ***thapsiana*** Kassebeer
Epandrium with arms (Fig. 176, 177); eye contiguity long (1:2.1-2.4); wing cell BM entirely or almost entirely (95%) covered with microtrichia ..... ***zloti*** Vujić

21 Surstylus with short, wide base and narrow, elongate apex (Figs 121, 133) **22**
Surstylus with wide base, tapering gradually towards narrower apex (Figs 33, 34, 44, 52, 112, etc.) **23**

22 Upper hypandrial process semicircular; lower gonocercus squarish; post-anal hood triangular (Figs 133, 134); tergite IV long, 1.5-1.8 times longer than sternite IV ..... ***nigriana*** (Séguy)
Upper hypandrial process triangular; lower gonocercus rectangular; post-anal hood a small plate with two humps (Figs 121-123); tergite IV very long, 2.2-2.3 times longer than sternite IV ..... ***mesasiatica*** Stackelberg

23 Surstylus, in lateral view, widest at medial part and narrowing acutely in apical part, in dorsal view with elevated inner surface (Figs 112, 113); eye contiguity very long (1:1.4-1.6) (Fig. 108); postpedicellus at most 1.5 times longer than wide (Figs 109, 110) ..... ***lyneborgi*** Torp
Surstylus, in lateral view, widest at base and gradually becoming narrower towards apex, in dorsal view without elevated inner surface (Figs 33-35, 44, 45, 52-53, 172,

173); eye contiguity short to very short (1:2.4-5.0); postpedicellus more than 1.9 times longer than wide (Figs 32, 42, 43, 51, 171) **24**

24 Post-anal hood a narrow plate, hardly visible in dorsal view (Fig. 52, 53); fore and mid tarsi with first and last tarsomeres yellow ..... ***bayburtica*** Claussen & Hayat
Post-anal hood a wide plate (Fig. 33, 34, 44, 172); fore and mid tarsi never with last tarsomere yellow **25**

25 Post-anal hood semi-circular (Figs 33, 34, 44); eye contiguity short (1:2.5-3.0); fore and mid tarsi with first, and sometimes second, tarsomeres yellow; tergite II 1.4-1.6 times wider than long **26**
Post-anal hood a wide plate with two rounded humps (Figs 172); eye contiguity very short (1:3.4-5.0); fore and mid tarsi entirely black; tergite II 1.9-2.2 times wider than long; surstylus relatively long, about as long as epandrium; lower gonocercus squarish; setae on inner surface of hypandrium confined to the apical half (Figs 172, 173); tergite IV entirely covered with pale setae ..... ***zeneggenensis*** (Goeldlin)

26 Epandrium circular; surstylus, in ventral view, tapering from apical three quarters towards narrow apex; surstylus in dorsal view with wide base, curved inner outline and narrow apex (Figs 44, 45); postpedicellus very long, 3.5-3.7 times longer than wide (Figs 42, 43) ..... ***antennata*** Violovitsh
Epandrium squarish; surstylus in ventral view, tapering gradually towards narrow apex; surstylus in dorsal view triangular, gradually tapering towards narrow apex (Figs 33-35); postpedicellus long, 2.3-2.7 times longer than wide (Fig. 32) ..... ***altaica*** Violovitsh

27 Lower gonocercus circular; hypandrium very wide, base at least as wide as entire length of hypandrium (Fig. 95); mid leg (in both sexes) with club-like tibia and elongate basitarsus (Figs 92, 93) ..... ***curvitibia*** Stackelberg
Lower gonocercus otherwise; hypandrium more elongate (Figs 5, 6, 11, 76-79, 90, 118, etc.); mid leg without modifications **28**

28 Lower gonocercus shaped as a bifurcate plate; upper hypandrial process hardly visible, or with long elongate process (Figs 5, 6, 11, 76-79, 90, etc.) **29**
Lower gonocercus otherwise; upper hypandrial process semi-circular (Figs 118, 126) **34**

29 Epandrium with baso-lateral hump (Figs 9, 103); hypandrium with elongate upper process; surstylus in lateral view elongate and curved (Figs 5, 11, 76, 104) **30**
Epandrium without baso-lateral hump; hypandrium without upper process; surstylus in lateral view widest at base, tapering toward apex (Figs 89, 90, 168, 169) **33**

30 Epandrium very large; hypandrium broad, widest at base; upper hypandrial process with large, oval appendage (Figs 5, 6); postpedicel long, 2.6-2.9 times longer than wide (Fig. 17); wing base extensively yellow ..... ***ochreobasalis*** Van Steenis & Lucas
Epandrium smaller; hypandrium narrow, widest at a third from base; upper hypandrial process with at most an inconspicuous hump (Figs 9, 11, 76, 104); postpedicel moderately long (Figs 7, 74, 101); wing base at most slightly yellow **31**

31 Arista with at least basal three quarters yellow; basitarsus of front and mid tarsi yellow, sometimes second tarsomere of mid tarsi yellow; surstylus, in lateral view, widest at medial part of its length; hypandrial process straight; upper gonocercus club-like, with shaft narrow and toothed at base, and with wide apex (Figs 9-11); eye contiguity short (1:2.4-2.9) ..... ***kuznetzovi*** Van Steenis & Lucas

Arista entirely dark-brown to black; at most basitarsus of mid tarsi yellow; surstylus in lateral view almost parallel-sided (Figs 76, 104); eye contiguity long or short to very short (1:2.0-4.1) **32**

32 Surstylus, in dorsal view, with inner median process not parallel sided and with a rounded apical corner; hypandrial process straight, with a small hump at base; upper gonocercus club-like, with wide shaft that is toothed at base and has a wide apex (Figs 103-105); eye contiguity long (1:2.0-2.3) ..... ***elegantissima*** Lucas

Surstylus, in dorsal view, with inner median process parallel sided and with a sharp apical corner; hypandrial process straight; upper gonocercus club-like, with narrow shaft that is toothed at base and has a wide apex (Figs 75-79); eye contiguity short to very short (1:2.9-4.1) ..... ***caucasica*** Skufjin

33 Upper gonocercus cockscomb-shaped, with one large tooth; lower gonocercus T-shaped; surstylus, in lateral view, wide at base, gradually tapering towards apex; post-anal hood rectangular (Figs 168, 169); tergite IV long, 1.4-1.7 times longer than sternite IV ..... ***virens*** (Fabricius)

Upper gonocercus cockscomb-shaped, with four large teeth; lower gonocercus very widely bifurcate; surstylus, in lateral view, very wide at base, heavily constricted in the basal half and with the apical part elongate; post-anal hood sharply triangular (Figs 89, 90); tergite IV very long, 2.0-2.1 times longer than sternite IV ..... ***cornuta*** Kuznetzov

34 Lower gonocercus hammer-shaped; upper gonocercus with one large and four smaller teeth; post-anal hood widely triangular (Figs 117, 118); eye contiguity very long (1:1.6-2.0) (Fig. 114); postpedicel long, 2.5-3.0 times longer than wide (Fig. 115) ..... ***maculipennis*** (Meigen)

Lower gonocercus songbird-head shaped; upper gonocercus with one large tooth; post-anal hood small, semi-circular (Figs 125, 126); eyes not touching; postpedicel short, 1.5-1.7 times longer than wide (Fig. 124) ..... ***mongolorum*** Stackelberg

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Hoverflies (Diptera, Syrphidae) new to Greece from the Rhodope Mountains of Thrace and eastern Macedonia, including *Simosyrphus scutellaris* new to Europe

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Summary

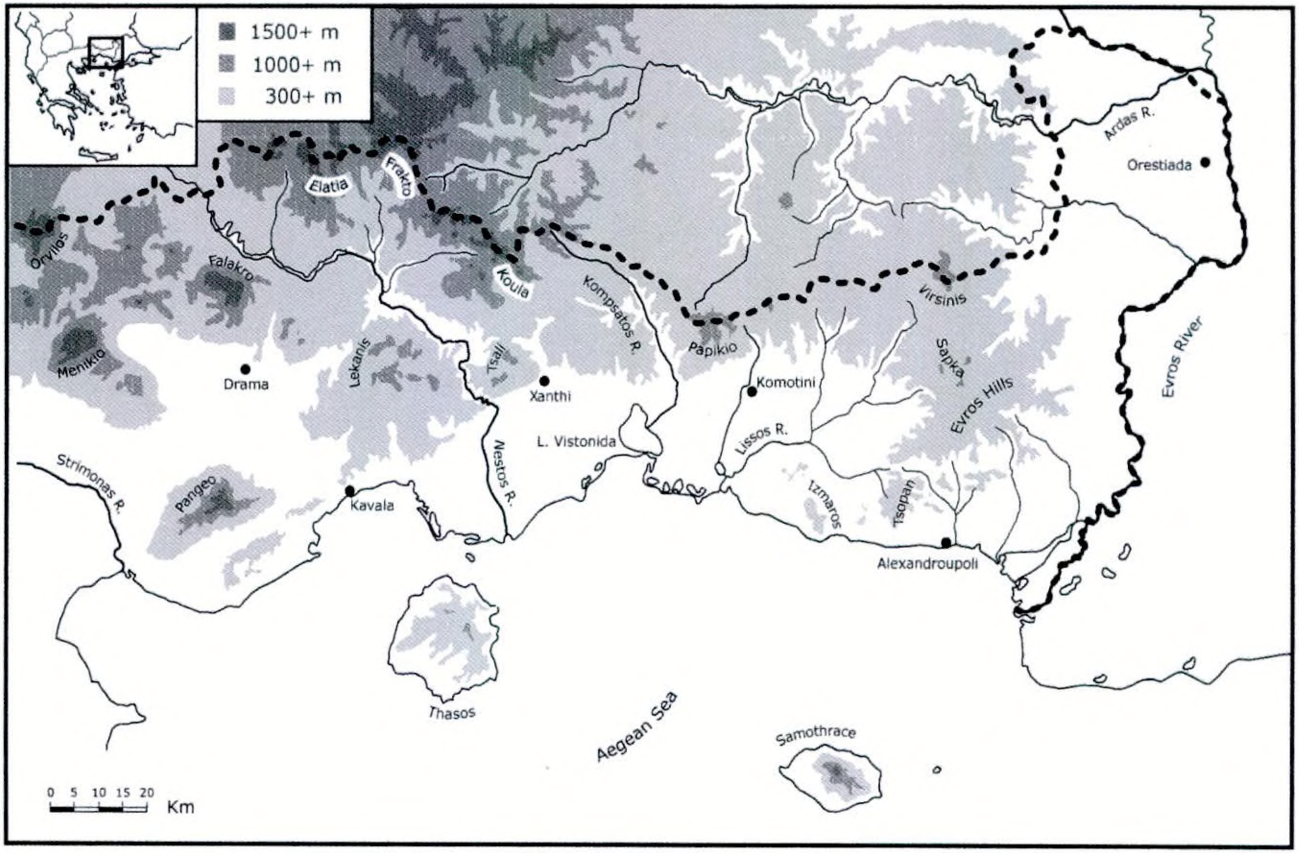
Forty-four species of Syrphidae are reported for the first time from Greece. One species, *Simosyrphus scutellaris* (Fabricius, 1805) is a new record for Europe. Another notable record is the European endemic *Epistrophella coronata* (Rondani, 1857), for which there are only two previous records, one from Italy and the other from Serbia. Amongst the remaining species woodland and saproxylic species predominate, highlighting the significance of the forest of the Rhodope Mountains as an area of notable biodiversity for the Greek fauna of Syrphidae, in particular for species of central European distribution. The main topological and forest habitat features of the Rhodope mountains are given in outline.

Περίληψη

Σαράντα τέσσερα είδη της οικογένειας Syrphidae καταγράφονται για πρώτη φορά στην Ελλάδα. Ένα είδος, το *Simosyrphus scutellaris* (Fabricius, 1805) είναι νέα αναφορά για την Ευρώπη. Μία ακόμη σημαντική αναφορά είναι το ευρωπαϊκό ενδημικό είδος *Epistrophella coronatus* (Rondani, 1857), το οποίο έχει καταγραφεί μόνο δύο φορές μέχρι τώρα, μία στην Ιταλία και μία στη Σερβία. Ανάμεσα στα υπόλοιπα είδη που περιγράφονται, τα δασικά και τα σαπροξυλικά είδη κυριαρχούν, υπογραμμίζοντας τη σπουδαιότητα των δασών της οροσειράς της Ροδόπης. Είναι μία περιοχή με σπουδαία βιοποικιλότητα για την ελληνική πανίδα των Syrphidae, ειδικά για είδη που συναντώνται συνήθως στην κεντρική Ευρώπη. Οι κύριοι τοπολογικοί και δασικοί βιότοποι της οροσειράς της Ροδόπης περιγράφονται σε γενικές γραμμές.

Introduction

The wide variety of geology and landscape form in Greece bestows on it a huge diversity of plant and animal species (Sfenthourakis and Legakis 2001). The Diptera are one of the least studied insect groups in Greece. However, a number of recent studies on Syrphidae indicate that this family probably has tremendous biodiversity in Greece (Vujić *et al.* 2000, Van der Weyer and Dils 1999, Standfuss and Claußen 2007, Dirickx 1994). Understandably many studies have focused on species found in thermophilous habitats, particularly species of the genus *Merodon*, which has revealed a rich fauna that includes a number of cryptic and endemic species (Hurkmans 1993, Vujić *et al.* 2007, Radenković *et al.* 2011). Even so, Vujić *et al.* (2000) rightly pointed out that the fauna of Greek forests has been little studied. The limited but widely dispersed literature on Greece has been summarised by Speight (2010) and Speight *et al.* (2010) who provided an updated list of the known Greek syrphid fauna. The records presented here are derived almost in their entirety from the Rhodope mountains and their foothills, in NE Greece (Eastern Macedonia and Thrace). It is hoped that the records presented here will contribute towards recognition of the conservation value of the region. An outline account of the area is provided because the place names and geographic terms, both in the literature and on maps, are often confusing due to changes resulting from the shifting geopolitical history and language use of the region.


1500+ m
1000+ m
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Orvilos
Falakro
Menikio
Elatia
Frakto
Koula
Drama
Lekanis
Tsali
Xanthi
Kompsatos R.
Papikio
Komotini
Virsinis
Sapka
Evros Hills
Evros River
Ardas R.
Orestiada
Strimonas R.
Pangeo
Kavala
Nestos R.
L. Vistonida
Lissos R.
Izmaros
Tsopan
Alexandroupoli
Thasos
Aegean Sea
Samothrace
0 5 10 15 20
Km

The Rhodope Mountains and their conservation value

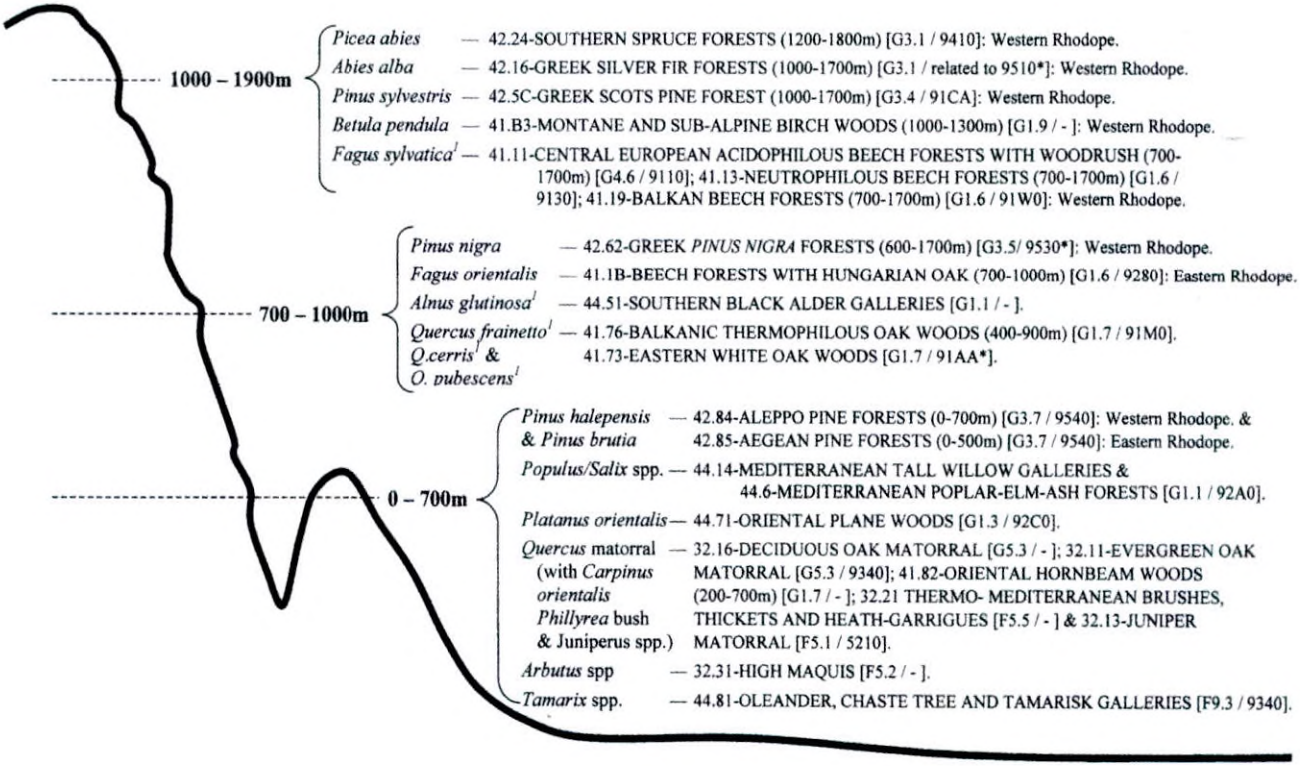
The northeast of Greece, comprising the regions of Thrace and East Macedonia, is of considerable interest both biogeographically and topographically (Beron 2006, Beron and Popov 2004, Catsadorakis and Källander 2010). The map (Fig. 1) shows the two main geomorphological features, which split the landscape roughly into two equally wide zones: the mountainous area of the Rhodope massif and the low alluvial plains sloping gently towards the Aegean sea (Catsadorakis 2010).

The Rhodope mountain chain, which is shared between Bulgaria (70%) and Greece (30%), has an east-west orientation, is 220km long and 100-120km wide. Whereas most of the mountainous areas in Greece are limestone, the Rhodope massif is an ancient and complex landscape of pre-Alpine metamorphic and igneous volcanic rocks and is geologically one of the oldest in Europe (Skias 2010). The development of the present-day Aegean Thracian lowlands occurred following active drainage of the Aegean Sea bays. Subsequent fluctuations in sea level, which stabilised some 7,500 years ago, led to the formation of its numerous deltas and coastal lagoons.

Big river valleys belonging to the Aegean water catchment area define the morphological borders of the Rhodope massif. To the north, the Maritza river forms a natural border with the Upper Thracian plain in Bulgaria. To the southwest in Greece, the Nestos river separates the Rhodope from other nearby mountain peaks such as Falakro (2232m), Ori Lekanis (1298m) and Tsali (Xanthi) mountain (1400m). These relatively detached mountain ridge units are morphologically related to the Rhodope and probably represent a disintegrated periphery of the ancient Rhodope massif close to the Aegean Sea. To the northwest, in Bulgaria, are other related high mountain regions of the Rila (2925m) and Pirin (2914m) ranges. To the east the Rhodope is usually divided into the higher elevations of the western Rhodope and the lower eastern Rhodope. The Arda river to the north in Bulgaria and the Kompsatos river in Greece form a natural division between the eastern and western Rhodope. The Kompsatos river valley follows the Bulgarian-Greek frontier eastwards until it flows southwards in the vicinity of Papikio Mountain (1483m), the highest peak of the eastern Rhodope. The lower slopes of the eastern Rhodope terminate over 100km away in the northeast where both the Ardas and Maritza rivers drain into the Evros river, which in turn forms the eastern boundary of the Rhodope. Here also to the southeast the lower slopes of the eastern Rhodope break up into the Evros hills and the smaller blocks of Tsopan and Izmaros hills, the latter extending down to the Aegean Sea at Maronia. Samothrace Island, situated 40km out to sea, can be considered as an isolated peak of the Rhodope massif but is now surrounded by the waters of the Aegean. South of Samothrace runs the deep trench of the North Anatolian fault, which determines the tectonic characteristics of the entire area. The neotectonic fault zone of Kavala-Xanthi-Komotini forms the southern boundary of almost the entire length of the Rhodope massif (Skias 2010). This fault zone runs for about 120km from the city of Kavala almost to the Evros river basin and separates the southern limit of the Rhodope mountains from the coastal west Thracian lowland.

The proximity of the Rhodope mountains to the Aegean sea, particularly their southern (Greek) slopes, puts them under a direct Mediterranean climatic influence. This gives rise to an especially elongated and mild autumn climate, particularly in the lower Eastern Rhodope. The geographic area of the Western Rhodope is intermediate between Mediterranean and

Fig. 1. Topographical map showing the location of the Rhodope mountains in north-east Greece.


1000 – 1900m
Picea abies — 42.24-SOUTHERN SPRUCE FORESTS (1200-1800m) [G3.1 / 9410]: Western Rhodope.
Abies alba — 42.16-GREEK SILVER FIR FORESTS (1000-1700m) [G3.1 / related to 9510*]: Western Rhodope.
Pinus sylvestris — 42.5C-GREEK SCOTS PINE FOREST (1000-1700m) [G3.4 / 91CA]: Western Rhodope.
Betula pendula — 41.B3-MONTANE AND SUB-ALPINE BIRCH WOODS (1000-1300m) [G1.9 / -]: Western Rhodope.
Fagus sylvatica[1] — 41.11-CENTRAL EUROPEAN ACIDOPHILOUS BEECH FORESTS WITH WOODRUSH (700-1700m) [G4.6 / 9110]; 41.13-NEUTROPHILOUS BEECH FORESTS (700-1700m) [G1.6 / 9130]; 41.19-BALKAN BEECH FORESTS (700-1700m) [G1.6 / 91W0]: Western Rhodope.
700 – 1000m
Pinus nigra — 42.62-GREEK PINUS NIGRA FORESTS (600-1700m) [G3.5/ 9530*]: Western Rhodope.
Fagus orientalis — 41.1B-BEECH FORESTS WITH HUNGARIAN OAK (700-1000m) [G1.6 / 9280]: Eastern Rhodope.
Alnus glutinosa[1] — 44.51-SOUTHERN BLACK ALDER GALLERIES [G1.1 / -].
Quercus frainetto[1] — 41.76-BALKANIC THERMOPHILOUS OAK WOODS (400-900m) [G1.7 / 91M0].
Q.cerris[1] & O. pubescens[1] 41.73-EASTERN WHITE OAK WOODS [G1.7 / 91AA*].
0 – 700m
Pinus halepensis & Pinus brutia — 42.84-ALEPPO PINE FORESTS (0-700m) [G3.7 / 9540]: Western Rhodope. & 42.85-AEGEAN PINE FORESTS (0-500m) [G3.7 / 9540]: Eastern Rhodope.
Populus/Salix spp. — 44.14-MEDITERRANEAN TALL WILLOW GALLERIES & 44.6-MEDITERRANEAN POPLAR-ELM-ASH FORESTS [G1.1 / 92A0].
Platanus orientalis — 44.71-ORIENTAL PLANE WOODS [G1.3 / 92C0].
Quercus matorral (with Carpinus orientalis Phillyrea bush & Juniperus spp.) — 32.16-DECIDUOUS OAK MATORRAL [G5.3 / -]; 32.11-EVERGREEN OAK MATORRAL [G5.3 / 9340]; 41.82-ORIENTAL HORNBEAM WOODS (200-700m) [G1.7 / -]; 32.21 THERMO- MEDITERRANEAN BRUSHES, THICKETS AND HEATH-GARRIGUES [F5.5 / -] & 32.13-JUNIPER MATORRAL [F5.1 / 5210].
Arbutus spp — 32.31-HIGH MAQUIS [F5.2 / -].
Tamarix spp. — 44.81-OLEANDER, CHASTE TREE AND TAMARISK GALLERIES [F9.3 / 9340].

continental zones of Europe. Because of the altitude and massif nature of the north and central western-mountain block, combined with the many deep gorges and wide river valleys, the influence of the Mediterranean climate is reduced there. This gives the whole Rhodope one of the most diverse and intricately structured climates in the entire region (Stefanov 2006). The Rhodope Mountains are covered in extensive forests of considerable biological diversity, with numerous altitudinal and climatic zones. Fig. 2 shows the principal forest tree and woody species and their corresponding CORINE biotope categories (Devillers *et al.* 1991) with EUNIS (Davies *et al.* 2004) and Annex 1 (European Commission 2007) codes.

The complex topography of the mountain range combined with its diverse hydro-climatic environment creates conditions for widely differing soil cover and great biodiversity in vegetation and fauna (Stefanov 2006, Yordanova 2004, Petrova 2004).

The lower eastern Rhodope is a hilly area with numerous deeply cut valleys, which gives it a mountainous appearance. The hills support Balkan thermophilous deciduous oak forest (predominately *Quercus frainetto, Q. cerris* and *Q. pubescens* but with other species such as *Q. petraea* subspecies *medwediewii*). Many other woody species occur in these forests including *Acer monspessulanum, Carpinus orientalis, Cornus mas, Fraxinus ornus, Ostrya carpinifolia,* and *Pyrus* species. On the lower slopes of the eastern Evros hills are the only known European sites for the rosaceous tree *Eriolobus trilobatus.* The forested areas here probably form the most expansive tracts of this vegetation in Greece, with a high biological value and floristically rich understorey (Korakis *et al.* 2010, Korakis and Gerasimidis 2010, Petrova 2004, Strid and Tan 1998). In areas where the oak forest is degraded (from burning and overgrazing), or because of poorer soil nutrition, forests of *Pinus brutia* (*Pinus halepensis* subspecies *brutia*) occur, most notably at low altitudes in the far eastern region of Dadia National park close to the Evros river. At higher altitudes (above 700m) the oak forest grades into beech forest, in this area comprised of *Fagus sylvatica* subspecies *orientalis* (with hybrid *moesiaca*). At lower altitude or in warmer, drier areas sclerophyllous shrub communities develop. These include Eastern Mediterranean high maquis with mostly evergreen species such as *Arbutus andrachne, Phillyrea latifolia, Erica arborea* and *Cistus* species; *Quercus coccifera/Q. ilex* matorral; Shiblyak, usually dominated by *Paliura spina-christi* brushwood, or *Juniperus oxycedrus* arborescent matorral. A distinctive feature throughout the eastern Rhodope is the occurrence of numerous streams and watercourses, along which develop important riparian gallery forests. These form a complex of significant and distinct riparian biotopes of Greek alder (*Alnus glutinosa*) galleries, *Salix alba* with *Populus alba* galleries or *Platanus orientalis* galleries.

Because of their greater altitude the Western Rhodope mountains have a higher incidence of boreal and sub-boreal, mesophytic forests typical of central Europe. Ranging from 1200m to 1800m coniferous forests occur with Scots pine (*Pinus sylvestris*), common fir (*Abies alba*) and spruce (*Picea abies*), the latter in its sole Greek outpost. At similar altitudes (1200-1500m), beech (*Fagus sylvatica* subspecies *sylvatica*) predominates and in certain places birch (*Betula pendula*) occurs, also in its only Greek locality. A unique montane old growth forest site at 1500-1950m is preserved as the nature reserve of Frakto Virgin Forest

Fig. 2. Altitudinal gradients of the principal tree and woody species with their corresponding CORINE habitat codes. EUNIS and Habitat Directive Annex I codes (* indicates priority habitats under Annex I), where they exist, are shown in square brackets. [/]Indicates biotopes that occur in lower zones additional to where they are shown.

(Eleftheriadou and Raus 1996). Above 1800m high altitude meadow-tundra elements appear and bog formations, rare in Greece, are found. The lower slopes have *Pinus halepensis* subspecies *halepensis* and Black pine (*Pinus nigra*). Below 800-900m xerothermic Mediterranean vegetation prevails with thermophilous oaks such as *Quercus frainetto*, *Q. cerris* and *Q. pubescens*. The vegetation and soil cover on the lower slopes and valleys have been heavily modified by continuous human influence and forest removal by pastoral shepherds, whose numerous flocks contribute to the production of one of Greece's best known exports – Feta cheese.

The alluvial plain of the Aegean Thracian lowland is intensively cultivated, producing a wide range of annual crops and a few fruit trees including olives, some of the coastal olive orchards being extremely ancient. Otherwise the vegetation is typically pseudo-steppe or continental steppe grassland. In the past the deltas supported extensive riparian forest and along with the lagoons, particularly Vistonida and Porto Lagos, had important lacustrine habitats (Sotiriou *et al.* 1989). Many of these have been cleared, drained and substantially reduced for commercial agricultural and political reasons.

Some of these landscapes have received important recognition on paper and have been categorised as Natura 2000 sites under the European Union Habitat and Species directive, or Special Protection Areas under the Birds directive. The designated areas include sites in: (a) the eastern Rhodope (Dasos Voreiou Evrou kai Arda, Dasos Dadias-Soufli [National Park], Treis Vryses, Vouna Evrou, Potamos Filiouris, Potamos Kompsatos-Nea Koiti, Maroneia-Spilaion); (b) western Rhodope (Oros Chaintou-Koula kai Gyro Koryfes, Aisthitiko Dasos Nestou, Dasos Fracktou, Rodopi Simyda, Periochi Elatia-Pyramis Koutra, Koryfes Orous Falakro) and (c) the Aegean Thracian lowland (Delta Evrou kai Dytikos Vrachionas, Limnes kai Limnothalasses tis Thrakis, Delta Nestou kai Limnothalasses Keramotis) (European Commission 2011). Full data sheets and geographic locations of these and all the other Natura 2000 sites in Europe can be viewed using the EU map viewer for Natura 2000 (http://natura2000.eea.europa.eu/#). However, most of their invertebrate fauna remain little studied or documented (Beron 2006, Beron and Popov 2004, Catsadorakis and Källander 2010). Many of the species recorded here are from these sites and one of the objectives of this text is to contribute towards documentation of their invertebrate biodiversity.

Species list

All of the species recorded here were collected by the authors over a number of years, using a hand net while wandering the steep and in our view beautiful terrain of the Rhodope. Geographic co-ordinates were obtained using WGS84 with a hand held GPS device (Garmin E-trex Vista HCx). All determinations have been checked by one of us (MCDS).

Records of species new to Greece and Europe

1. *Simosyrphus scutellaris* (Fabricius, 1805) New to Europe.

Maronia (Marmaritsa) (Izmaros Hills) Eastern Rhodope Mtns, Nomos Rhodope. N40°52'14.8" E25°31'47.8" (UTM 35 T 0376122 4525452), 2.x.2007, ♂, streamside in ancient coastal olive groves with mixed xerothermic scrub woodland on granite at 36m. **Evros Delta.** Nomos Evros, N40°49'46.8" E26°00'59.9" (UTM 35 T 0417085 4520315), 16.ix.2007, ♂, swept from wet ditch, grazed coastal delta grassland with adjacent habitat of *Tamarix* scrub at 0m.

Previously known as *Ischiodon scutellaris*, this is a cosmopolitan Oriental and Australasian species previously known from the Palaearctic in the Transcaucasus and

predicted to occur in Europe by Speight (2010). The species is illustrated here in Fig. 3 and can be identified with the keys given by Speight and Sarthou (2010). It is likely to prove a migrant species, forming temporary summer populations here. It is noteworthy that this has been observed by one of us (MdeCW) to be the case in the Evros delta for another strongly migrant insect from Asia/Africa, the butterfly *Danaus chrysippus* (the plain tiger).

Fig. 3. Male of *Simosyrphus scutellaris*.

Fig. 4. Male of *Epistrophella coronata*.

Records of species new to Greece

2. *Brachyopa bicolor* (Fallén, 1817)
Lefkimi (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°02'02.8" E26°06'00.7" (UTM 35 T 0424363 4542934), 16.iv.2009, ♂, gallery forest of *Carpinus/Alnus/Quercus cerris* along river within mixed xerothermic *Quercus pubescens/frainetto* at 111m.

An infrequently recorded saproxylic species with a wide distribution in Europe, and already known from the Balkan peninsula.

3. *Brachyopa grunewaldensis* Kassebeer, 2000
Sápka Mountain (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°08'35.1" E25°54'37.2" (UTM 35 T 0408555 4555213), 24.iv.2008, ♀, streamside clearing in ancient *Fagus* forest with old *Carpinus* at 769m. **Avandas** (Derveni) (Evros Hills). East Rhodope Mtns, Nomos Evros. N40°55'55.9" E25°54'59.1" (UTM 35 T 0408774 4531797), 18.iv.2007, ♀, on *Crataegus* flowers, thermophilous *Quercus frainetto/pubescens* forest at 113m. **Esimi** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°01'38.9" E25°57'49.6" (UTM 35 T 0412889 4542323), 13.v.2008, ♂♂, riverside in thermophilous *Quercus frainetto/pubescens/cerris* forest at 251m. **Kirki Road** (Tsopan Hills). Eastern Rhodope Mtns, Nomos Evros, N40°56'54.9" E25°45'37.3" (UTM 35 T 0395661 4533789), 18.v.2008, ♂, thermophilous *Quercus frainetto/pubescens* forest at 480m.

A saproxylic species, probably associated with *Quercus* species, and known previously only from central and southern Germany, Switzerland and southern France.

4. *Brachyopa insensilis* Collin, 1939

Lefkimi (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°02'02.8" E26°06'00.7" (UTM 35 T 0424363 4542934), 16.iv.2009, ♂, gallery forest of *Carpinus/Alnus/Quercus cerris* along river within mixed xerothermic *Quercus pubescens/frainetto* at 111m. **Kallithea** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'38.4" E25°57'47.4" (UTM35 T 0412947 4551559), 10.v.2010, ♀, mixed *Quercus* and *Fagus* forest at 900m. **Treis Vreises** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'49.7" E26°01'36.7" (UTM 35 T 0418297 4551847), 1.v.2008, ♀, thermophilous *Quercus frainetto/cerris* forest at 642m.

A saproxylic species widely distributed throughout Europe.

5. *Brachyopa plena* Collin, 1939

Sápka Mountain (Evros Hills). East Rhodope Mtns, Nomos Evros. N41°08'35.1" E25°54'37.2" (UTM 35 T 0408555 4555213), 24.iv.2008, ♀, streamside clearing in ancient *Fagus* forest with old *Carpinus* at 769m. **Avandas** (Derveni) (Evros Hills). East Rhodope Mtns, Nomos Evros, N40°55'55.9" E25°54'59.1" (UTM 35 T 0408774 4531797), 20.iv.2010, ♂♂, on *Crataegus* flowers, thermophilous *Quercus frainetto/pubescens* forest at 113m. **Kallithea** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'38.4" E25°57'47.4" (UTM35 T 0412947 4551559), 20.iv.2009, ♂, mixed *Quercus* and *Fagus* forest at 900m.

An eastern European saproxylic species until recently confused with *B. pilosa* Collin, 1939 and *B. scutellaris* Robineau-Desvoidy, 1843.

6. *Brachyopa vittata* Zetterstedt, 1843

Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 12.vi.2010, ♀, clearing with stream and marshy ground in mixed *Abies/Picea/Fagus* forest at 1553m.

A saproxylic species associated with *Picea,* with a wide distribution range including the Balkan Peninsula.

7. *Brachypalpus chrysites* Egger, 1859

Frakto Forest: Karydorema. West Rhodope Mtns, Nomos Drama, N41°30'32.6" E24°27'31.8" (UTM 35 T 0287928 4598387), 20.iv.2008, ♂, on *Crataegus* flowers, streamside with clearings in mixed *Picea/Pinus/Fagus* forest at 1160m. **Elatia Forest:** Anthiro. West Rhodope Mtns, Nomos Drama, N40°53'11.1" E25°52'20.1" (UTM 35 T 0273672 4597488), 5.iv.2010, ♂, on *Prunus spinosa* flowers on trackside mixed *Picea/Pinus/Fagus* forest at 1440m.

This large densely hairy and brassy coloured species is a saproxylic of *Picea* forest and is associated with overmature trees. It is infrequently recorded but known from northern Europe and mountainous parts of central and southern Europe including the Balkan Peninsula (Vujić and Milankov 1999) to Turkey and European Russia. It is probably now endangered over much of its natural range in Europe.

8. *Brachypalpus laphriformis* (Fallén, 1816)

Treis Vreises (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'15.6" E26°00'01.6" (UTM 35 T 0416067 4550850), 21.iv.2007, ♂, on *Prunus cerasus* flowers, trackside in thermophilous mixed *Fagus orientalis/Quercus frainetto/pubescens* forest at 614m.

A saproxylic species associated with *Fagus* and *Quercus* with a wide distribution in Europe including the Balkan Peninsula, where it is recorded infrequently (Vujić and Milankov 1999).

9. *Callicera spinolae* Rondani, 1844

Esimi (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°01'38.9" E25°57'49.6" (UTM 35 T 0412889 4542323), 17.ix.2007, ♂♂♀♀, on *Hedera* flowers in *Alnus glutinosa* gallery woods with *Carpinus* and *Quercus cerris*, within thermophilous *Quercus frainetto/pubescens/cerris* forest at 251m. **Lefkimi** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°02'02.8" E26°06'00.7" (UTM 35 T 0424363 4542934), 18.ix.2007, ♂♂♀♀; 17.x.2007, ♂♂♀♀, on *Hedera* flowers in gallery forest of *Carpinus/Alnus/Quercus cerris* along river within mixed thermophilous *Quercus pubescens/frainetto* at 111m. **Sílo Mtn**: southern valley. (Evros Hills). Eastern Rhodope Mtns, Nomos Evros, N41°08'53.2" E25°59'00.9" (UTM 35 T 0414709 4555697) 4, 8 & 11.ix.2008, ♂♂♀♀, on *Hedera* flowers in *Alnus glutinosa* gallery woods within thermophilous *Quercus frainetto/pubescens/cerris* forest at 447m.

This is a large and distinctively metallic brassy coloured species. It is a saproxylic and is associated with *Fagus* and *Quercus* forest with overmature and senescent trees. It has a wide distribution, including the Mediterranean region but is infrequently recorded.

10. *Chalcosyrphus eunotus* Loew, 1873

Sápka Mountain (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°08'35.1" E25°54'37.2" (UTM 35 T 0408555 4555213), 12.v.2009, ♂, swept from small shaded rivulet with submerged logs on steep slope in ancient *Fagus* forest with old *Carpinus* at 769m.

This is a saproxylic species associated with alluvial swamp forest and, as in this case, along the bed of seasonal forest streams, which contain fallen timber. The species is secretive and poorly recorded but has a wide range in Europe. On the Balkan Peninsula it has been recorded previously from Croatia, Serbia and the former Yugoslav Republic of Macedonia (Milankov *et al.* 1995, Vujić and Milankov 1999).

11. *Chalcosyrphus nemorum* (Fabricius, 1805)

Avandas (Derveni) (Evros Hills). East Rhodope Mtns, Nomos Evros, N40°55'55.9" E25°54'59.1" (UTM 35 T 0408774 4531797), 6.ix.2010, ♀, thermophilous *Quercus frainetto/pubescens* forest at 113m. **Esimi** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°01'38.9" E25°57'49.6" (UTM 35 T 0412889 4542323), 16.iv.2007, ♂, riverside in thermophilous *Quercus frainetto/pubescens/cerris* forest at 251m.

A saproxylic species associated with deciduous forest and woodland with a wide distribution. On the Balkan peninsula previously recorded from Slovenia, Croatia, Bosnia and Herzogovina and Serbia (Milankov *et al.* 1995).

12. *Criorhina berberina* (Fabricius, 1805)

Kallithea (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'38.4" E25°57'47.4" (UTM35 T 0412947 4551559), 8.v.2010, ♀, mixed *Quercus* and *Fagus* forest at 900m. **Elatia Forest:** Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 12.vi.2010, ♀, clearing with stream and marshy ground in mixed *Abies/Picea/Fagus* forest at 1553m. **Frakto Forest:** Achladorema. West Rhodope Mtns, Nomos Drama, N41°30'47.6" E24°31'11.6" (UTM 35 T 0291479 4598747),

20.vii.2008, ♀, on *Sambucus ebulus*, streamside vegetation and clearings in mixed *Abies/Fagus* forest at 1285m.

A common saproxylic species associated with a wide range of deciduous and coniferous woodland. Widely distributed throughout Europe including the Balkan Peninsula (Vujić and Milankov 1999).

13. *Criorhina floccosa* (Meigen, 1822)

Treis Vreises (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'15.6" E26°00'01.6" (UTM 35 T 0416067 4550850), 21.iv.2007, ♂♂, on *Prunus cerasus* flowers and visiting deeply shaded stream pools, trackside thermophilous mixed *Fagus orientalis/Quercus frainetto/pubescens* forest at 614m. **Sápka Mountain** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°08'35.1" E25°54'37.2" (UTM 35 T 0408555 4555213), 24.iv.2008, ♂♂, streamside clearing in ancient *Fagus* forest with old *Carpinus* at 769m.

A saproxylic species associated with *Fagus* and *Quercus* forest. Widely distributed in Europe including the Balkan Peninsula, where it is considered rare (Vujić and Milankov 1999).

14. *Criorhina pachymera* (Egger, 1858)

Treis Vreises (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°10'16.0" E26°01'31.9" (UTM 35 T 0418256 4558209), 25.v.2008, ♀, on *Euphorbia* flowers, trackside thermophilous *Quercus frainetto/cerris* forest at 668m. **Frakto Forest:** Karydorema. West Rhodope Mtns, Nomos Drama, N41°30'32.6" E24°27'31.8" (UTM 35 T 0287928 4598387), 20.iv.2008, ♂♂, on *Crataegus* flowers, streamside with clearings in mixed *Picea/Pinus/Fagus* forest at 1160m.

A saproxylic species associated with Mediterranean, riparian ash woods in mesophilous *Fagus* forest and thermophilous *Quercus* forest, but occurring also with riparian *Populus* forest in both the Mediterranean zone and central Europe. Listed as a threatened species on the Balkan Peninsula by Vujić *et al.* (2001).

15. *Criorhina ranunculi* (Panzer, 1804)

Oros Chaintou-Koula: Erimanthos, nr Livaditis. West Rhodope Mtns, Nomos Xanthi, N41°18'47.8" E24°41'42.2" (UTM 35 T 0307065 4576098), 20.iv.2008, ♂, on *Prunus spinosa* flowers, mixed *Fagus sylvatica/Betula pendula* forest at 1180m. **Elatia Forest**: Anthiro. West Rhodope Mtns, Nomos Drama, N40°53'11.1" E25°52'20.1" (UTM 35 T 0273672 4597488), 5.iv.2010, ♂♂, on flowers of *Salix caprea* trackside in mixed *Pinus/Picea/Fagus* forest at 1440m.

A saproxylic species associated with ancient mesophilous forest of *Fagus, Quercus* and *Betula*. A predominantly northern species recorded on the Balkan Peninsula only from Croatia and Serbia, where it is regarded as rare (Vujić and Milankov 1999).

16. *Dasysyrphus pauxillus* (Williston, 1887)

Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 12.vi.2010, ♀, clearing with stream and marshy ground in mixed *Picea/Fagus* forest at 1553m.

A central and northern European species associated with *Picea* forest.

17. *Dasysyrphus tricinctus* (Fallén, 1817)

Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 12.vi.2010, ♀, clearing with stream and marshy ground in mixed *Picea/Fagus* forest at 1553m.

A widely distributed species particularly associated with *Picea* forest but which also occurs in many other woodland situations.

18. *Didea alneti* (Fallén, 1817)

Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 2.ix.2010, ♂♂♀, clearing with stream and marshy ground in mixed *Picea/Fagus* forest at 1553m.

A widely distributed Holarctic species, particularly associated with coniferous forest.

19. *Epistrophella coronata* (Rondani, 1857)

Avandas (Derveni) (Evros Hills). East Rhodope Mtns, Nomos Evros, N40°55'55.9" E25°54'59.1" (UTM 35 T 0408774 4531797), 20.iv.2007, ♂, on *Crataegus* flowers. Thermophilous *Quercus frainetto/pubescens* forest at 113m.

Listed as a threatened species on the Balkan Peninsula and hence at the European level by Vujić *et al.* (2001). This is a very infrequently observed species in Europe, known previously only from Italy and Serbia (Doczkal and Vujić 1998). Fig. 4 illustrates the distinctive markings of this species. In addition to the full morphological treatment given in Doczkal and Vujić (1998) the key to genera given by Speight and Sarthou (2010) can be used to identify this species because of its distinctive morphology.

20. *Eumerus sogdianus* Stackelberg, 1952

Evros delta: Nomos Evros, N40°50'09.1" E26°00'11.5" (UTM 35 T 0415959 4521013), 13.v.2010, ♂♂, coastal delta grassland and *Tamarix* scrub by ditch at 2m above sea.

A widely distributed eastern Palaearctic species, only recently recorded in Europe. It is associated with dry and humid unimproved grassland, including pasture, coastal dunes and alluvial floodplains.

21. *Lejops vittatus* (Meigen, 1822)

Evros delta: Nomos Evros, N40°50'09.1" E26°00'11.5" (UTM 35 T 0415959 4521013), 13.v.2010, ♂, on umbellifer flowers at ditch side with coastal delta grassland and *Tamarix* scrub at 2m above sea. **Palagia**: Nomos Evros, N40°53'11.0" E25°52'20.2" (UTM 35 T 0404994 4526756), 10.v.2010 ♀, village surrounded with agricultural fields and temporary streams at 84m asl.

This species is associated with standing or slow-moving freshwater habitats, including coastal lagoons. It is widely distributed occurring in central and southern Europe and right across Eurasia to the Pacific.

22. *Mallota cimbiciformis* (Fallén, 1817)

Treis Vreises (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'49.7" E26°01'36.7" (UTM 35 T 0418297 4551847), 28.v.2009, ♂, thermophilous *Quercus frainetto/cerris* forest at 642m.

This is a saproxylic species associated with water-filled rotholes in *Fagus and Quercus* (including evergreen *Quercus*) forest with overmature and senescent trees. It is an infrequently recorded species with a wide range from northern, central and southern Europe to Siberia and northern Iran.

23. *Megasyrphus erraticus* (Linnaeus, 1758)
Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 2.ix.2010, ♀, clearing with stream and marshy ground in mixed *Picea/Fagus* forest at 1553m.

A widespread species associated with coniferous forest. It is known from the Balkan Peninsula and the species becomes increasingly montane in southern parts of its range.

24. *Meliscaeva cinctella* (Zetterstedt, 1843)
Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 2.ix.2010, ♂♂♀♀, clearing with stream and marshy ground in mixed *Picea/Fagus* forest at 1553m.

A very widely distributed Holarctic species associated with a wide range of forest and scrub habitats including coniferous plantations.

25. *Merodon chalybeus* Wiedemann in Meigen, 1822
Mesimbria (Izmaros Hills). Eastern Rhodope Mtns, Nomos Rhodope, N40°52'16.2" E25°37'51.1" (UTM 35 T 0381819 4525402), 3.iv.2008, ♂♂♀♀, rocky short grassy patches with seaside xerothermic *Quercus coccifera* maquis on limestone at 28m. **Evros delta**: Nomos Evros, N40°50'09.1" E26°00'11.5" (UTM 35 T 0415959 4521013), 2.v.2010, ♂♂, coastal delta grassland and *Tamarix* scrub by ditch at 2m above sea.

A widespread Mediterranean species, occurring from Spain across to the Balkan Peninsula. The adults are found flying very low on the ground, frequently basking on bare soil and rocks, as well as in short-turf grassland habitats.

26. *Merodon trebevicensis* Strobl, 1900
Kallithea (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'38.4" E25°57'47.4" (UTM35 T 0412947 4551559), 16.v.2008, ♂♂, mixed *Quercus* and *Fagus* forest at 900m.

This species is associated with clearings in forests including *Fagus, Quercus* and *Castanea* forests. It was previously known under the name *M. crymensis* Paramonov, 1925 and is known from central and eastern Europe.

27. *Myolepta obscura* Becker, 1882
Sápka Mountain (Evros Hills). East Rhodope Mtns, Nomos Evro,. N41°08'35.1" E25°54'37.2" (UTM 35 T 0408555 4555213), 24.iv.2010, ♂, streamside clearing in ancient *Fagus* forest with old *Carpinus* at 769m. **Avandas** (Derveni) (Evros Hills). East Rhodope Mtns, Nomos Evros, N40°55'55.9" E25°54'59.1" (UTM 35 T 0408774 4531797), 26.iv.2007, ♀, on *Prunus* flowers, thermophilous *Quercus frainetto/pubescens* forest at 113m.

This is a saproxylic species associated with old deciduous forests, including gallery forests with *Populus* and *Fraxinus*. It is known from central and eastern Europe and may be threatened with extinction at the European level.

28. *Myolepta vara* (Panzer, 1798)
Sápka Mountain (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°08'35.1" E25°54'37.2" (UTM 35 T 0408555 4555213), 24.iv.2010, ♂, streamside clearing in ancient *Fagus* forest with old *Carpinus* at 769m. **Kallithea** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'38.4" E25°57'47.4" (UTM35 T 0412947 4551559), 16.v.2008, ♂♂. Mixed *Quercus* and *Fagus* forest at 900m. **Treis Vreises** (Evros Hills). East Rhodope Mtns,

Nomos Evros, N41°06'49.7" E26°01'36.7" (UTM 35 T 0418297 4551847), 1.v.2008, ♂♂, on *Sorbus* flowers, thermophilous *Quercus frainetto/cerris* forest at 642m.

This is an infrequently recorded saproxylic species associated with *Quercus* forest. It is known from the Balkan Peninsula and has a wide distribution from central and southern

29. *Neoascia annexa* (Müller, 1776)

Frakto Forest: near Ergotaxio Frakto. West Rhodope Mtns, Nomos Drama, N41°30'42.0" E24°30'04.4" (UTM 35 T 02888295 4487550), 6.vi.2009, ♀, damp clearing with *Rubus* in mixed *Abies/Fagus* forest at 1370m.

This is a forest species associated with streams in *Fagus/Picea* forest. It is a widely distributed species known from northern and mountainous parts of central and southern Europe, including the Balkan Peninsula.

30. *Parasyrphus lineola* (Zetterstedt, 1843)

Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 2.ix.2010, ♀♀, clearing with stream and marshy ground in mixed *Picea/Fagus* forest at 1553m.

This is a widely distributed Holarctic species, known from the Balkan Peninsula. It is associated with *Picea* forest and other conifers, including plantation forests.

31. *Pelecocera scaevoides* (Fallén, 1817)

Frakto Forest: near Ergotaxio Frakto. West Rhodope Mtns, Nomos Drama, N41°30'42.0" E24°30'04.4" (UTM 35 T 02888295 4487550), 6.vi.2009, ♂♂, damp clearing with *Rubus* in mixed *Fagus/Picea/Pinus* forest at 1370m.

A widely distributed species associated with coniferous forest, particularly *Pinus* and known from elsewhere in the Balkan Peninsula.

32. *Pipiza quadrimaculata* (Panzer, 1804)

Elatia Forest: Stravorema. West Rhodope Mtns, Nomos Drama, N41°30'24.3" E24°20'04.0" (UTM 35 T 0277538 4598446), 26.vi.2010, ♂♀, streamside clearing with gallery forest in mixed *Picea/Fagus* forest at 1364m.

A widely distributed species associated with coniferous and *Fagus* forest, and known from elsewhere in the Balkan Peninsula.

33. *Platycheirus europaeus* Goeldlin, Maibach & Speight, 1990

Elatia Forest: Stravorema. West Rhodope Mtns, Nomos Drama, N41°30'24.3" E24°20'04.0" (UTM 35 T 0277538 4598446), 26.vi.2010, ♂♂, streamside clearing with gallery forest in mixed *Picea/Fagus* forest at 1364m.

This species is associated with humid grasslands and wetlands up into the montane forest zone. It is widely distributed in Europe and has been recorded from the Balkan Peninsula.

34. *Platycheirus muelleri* Marcuzzi, 1941

Avandas (Derveni) (Evros Hills). East Rhodope Mtns, Nomos Evros, N40°55'55.9" E25°54'59.1" (UTM 35 T 0408774 4531797), 17.iv.2007, ♂, on *Prunus spinosa* flowers, thermophilous *Quercus frainetto/pubescens* forest at 113m.

This species closely resembles *P. albimanus* (Fabricius, 1781) and doesn't appear in any recent keys. The female is as yet indistinguishable from the female of *P.albimanus*, but

the male may be recognised by the characteristic black markings on the ventral surface of the segments of its front tarsi (Fig. 5). It has a much more restricted range and is recorded previously from southern France, including Corsica, and northern Italy. It has previously been associated with mesophilous *Fagus* forest but we record it from thermophilous *Quercus* forest. This is the first record from the Balkan Peninsula, although it would be expected to occur much more widely in the area.

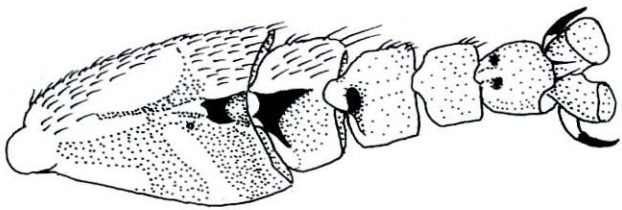


Fig. 5. Ventral surface of the male fore tarsus of *Platycheirus muelleri*.

35. *Pocota personata* (Harris, 1780)
Avandas (Derveni) (Evros Hills). East Rhodope Mtns, Nomos Evros, N40°55'55.9" E25°54'59.1" (UTM 35 T 0408774 4531797). 29.iv.2007, ♂, on wet soil, thermophilous *Quercus frainetto/pubescens* forest at 113m.

This bumblebee mimic is a saproxylic species associated with rot holes in over-mature and senescent deciduous trees. Previously associated with *Fagus* forest it has now been recorded from other tree species. There are no *Fagus* in the forest where we record it here but along with *Quercus* there is a range of other tree species including gallery forest tree species, indicated by the presence of other saproxylic syrphid species such as *Myolepta obscura*. *Pocota personata* has a wide distribution, including the Balkan Peninsula but it is infrequently recorded.

36. *Sphaerophoria virgata* Goeldlin, 1974
Elatia Forest: Stravorema. West Rhodope Mtns, Nomos Drama, N41°30'24.3" E24°20'04.0" (UTM 35 T 0277538 4598446), 26.vi.2010, ♂, streamside clearing with gallery forest in mixed *Picea/Fagus* forest at 1364m.

A species whose distribution is not well known, although it appears to be widespread in Europe. Listed as a threatened species on the Balkan peninsula by Vujić *et al.* (2001). It is associated with open ground in mesophilous *Fagus/Picea* and *Pinus* forests.

37. *Sphegina clunipes* (Fallén, 1816)
Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 12.vi.2010, ♂, clearing with stream and marshy ground in mixed *Picea/Fagus* forest at 1553m.

A very widely distributed and common species associated with all types of humid deciduous and coniferous forest.

38. *Sphegina latifrons* Egger, 1865

Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 12.vi.2010, , clearing with stream and marshy ground in mixed *Picea/Fagus* forest at 1553m.

This species is associated with streamside vegetation in *Fagus/Picea* woodlands and is also found in open grasslands on into montane grassland. It has a wide distribution in central and southern Europe and has been recorded in the Balkan Peninsula.

39. *Sphegina sibirica* Stackelberg, 1953

Elatia Forest: Stravorema. West Rhodope Mtns, Nomos Drama, N41°30'24.3" E24°20'04.0" (UTM 35 T 0277538 4598446), 26.vi.2010, ♀, streamside clearing with gallery forest in mixed *Picea/Fagus* forest at 1364m.

This is a species of northern and central European *Picea* forests, including conifer plantations and is known to be expanding its range in Europe.

40. *Sphegina sublatifrons* Vujić, 1990

Elatia Forest: Kria Vrysi. West Rhodope Mtns, Nomos Drama, N41°28'18.8" E24°19'23.6" (UTM 35 T 0276482 4594603), 10 June 2010, ♂, clearing with stream and marshy ground in mixed *Picea/Fagus* forest at 1553m.

A recently described species (Vujić 1990) known only from elsewhere in the Balkan Peninsula (former Yugoslav Republic of Macedonia, Serbia and Slovenia), where it is associated with streams and springs in montane *Picea/Abies* forest above 1200m. The west Rhodope mountains are the only locality for *Picea/Abies* forest in Greece and the occurrence of this species in the Elatia forest underlines the importance of this area for invertebrate biodiversity in Greece.

41. *Sphiximorpha binominata* (Verrall, 1901)

Avandas (Derveni) (Evros Hills). East Rhodope Mtns, Nomos Evros, N40°55'55.9" E25°54'59.1" (UTM 35 T 0408774 4531797), 15.iv.2007, ♀, on *Crataegus* flowers, thermophilous *Quercus frainetto/pubescens* forest at 113m, ♂♂♀♀ abundant on trackside mud puddles. **Kirki Road** (Tsopan Hills). Eastern Rhodope Mtns, Nomos Evros,. N40°56'54.9" E25°45'37.3" (UTM 35 T 0395661 4533789), 2.vi.2007, ♂♀, thermophilous *Quercus frainetto/pubescens* forest at 480m. **Esimi** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°01'38.9" E25°57'49.6" (UTM 35 T 0412889 4542323), 18.vii.2007, ♀, on wet soil riverside in thermophilous *Quercus frainetto/pubescens/cerris* forest at 251m. **Kallithea** (Evros Hills). East Rhodope Mtns, Nomos Evros, N41°06'38.4" E25°57'47.4" (UTM35 T 0412947 4551559), 7.v.2010, ♀, swept from *Quercus* foliage, mixed *Quercus* and *Fagus* forest at 900m.

The adult of this saproxylic species is a remarkable sphecid wasp mimic and is associated with ancient *Quercus* forest. It is poorly recorded in Europe but it must be an abundant, if infrequently observed, component of Balkan thermophilous *Quercus* forests. The adults have been seen abundantly on mud puddles in dry years and it has been observed feeding on *Crataegus* flowers. It is found in southern and eastern Europe including the Balkan Peninsula but there are few modern records of this species, which might well be threatened with extinction within its natural range. The forests of northeast Greece represent an important resource for this species.

42. *Temnostoma vespiforme* (Linnaeus, 1758)

Frakto Forest: Achladorema. West Rhodope Mtns, Nomos Drama, N41°30'47.6" E24°31'11.6" (UTM 35 T 0291479 4598747), 20.vii.2008, ♀, on *Sambucus ebulus*. Streamside vegetation and clearings in mixed *Fagus/Picea* forest at 1285m.

This is a saproxylic species associated with deciduous forest and gallery forest with fallen timber. It has a wide distribution in the Palaearctic and Nearctic regions and is the most common *Temnostoma* species in central Europe.

43. *Xylota jakutorum* Bagatshanova, 1980

Frakto Forest: near Ergotaxio Frakto. West Rhodope Mtns, Nomos Drama, N41°30'42.0" E24°30'04.4" (UTM 35 T 02888295 4487550), 6.vi.2009, ♂♂, damp clearing with *Rubus* in mixed *Fagus Picea* forest at 1370m.

This is a saproxylic species associated with coniferous forest, including plantation forests. It has been associated with sap runs caused by wood-boring weevils of the genus *Hylobius*. It has a wide distribution in the Palaearctic and has been recorded on the Balkan Peninsula (as *X. coeruliventris* (Zetterstedt, 1838)) from Slovenia, Bosnia and Herzogovina and Serbia (Milankov *et al.* 1995, Vujić and Milankov 1999).

44. *Xylota tarda* Meigen, 1822

Frakto Forest: Karydorema. West Rhodope Mtns, Nomos Drama, N41°30'32.6" E24°27'31.8" (UTM 35 T 0287928 4598387), 9.viii.2008, ♂, streamside vegetation and clearings in mixed *Picea/Pinus/Fagus* forest at 1160m. **Oros Chaintou-Koula**: Erimanthos, nr Livaditis. West Rhodope Mtns, Nomos Xanthi, N41°20'32.0" E24°43'22.1" (UTM 35 T 0309472 4579250), 9.viii.2007, ♂, trackside in mixed *Quercus/Fagus sylvatica* forest at 1317m.

This is a saproxylic species, which occurs in a wide range of deciduous forest and scrub woodland. It has a wide distribution in the Holarctic and has been recorded previously on the Balkan Peninsula from Bosnia and Herzegovina, Montenegro, Serbia and the former Yugoslav Republic of Macedonia (Milankov *et al.* 1995, Vujić and Milankov 1999).

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Some notes on *Dolichopus laticola* (Verrall) (Diptera, Dolichopodidae) a UK BAP Priority Fly; the first recent record of this species outside Norfolk

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Summary
The UK BAP Priority Fly *Dolichopus laticola* (Verrall, 1904) was collected at Walberswick NNR, Suffolk during 2010. This constitutes the first recent record of this species outwith the Broads area of Norfolk. As part of a study of the habitat affinities of Dolichopodidae, 134 specimens of *D. laticola* were obtained from two of the habitat types investigated; wet fen appearing to be the preferred habitat for this species, although numbers of *D. laticola* were also found in wet woodland.

Introduction

Since the original description of *Dolichopus laticola* (Verrall, 1904) from specimens collected at Ormesby Broad, Norfolk in 1888 (Verrall 1904) all records of *D. laticola* have been confined to the Broads area of Norfolk, leading to its English sobriquet of Broads Long-legged Fly. Verrall anticipated this association in his selection of the specific name (from latus = broad and -cola = dweller).

Following Verrall's records, *D. laticola* has been subsequently recorded from Bure Nature Reserve by d'Assis-Fonseca (1978) and from Woodbastwick, Mills Marsh in the Bure valley and Catfield in the Ant valley (Laurence 1995). These records are included in the English Nature Research Report no 477 (Lott *et al.* 2002). During 2010, Martin Drake (*pers. comm.*) found *D. laticola* at three sites in the Ant valley (Catfield, Sutton and Barton) and three in the Bure valley (Woodbastwick, Ebb and Flow and Horning Marsh Farm). All the above named sites form part of the River Bure catchment of the Norfolk Broads National Park. In Europe *D. laticola* appears to be similarly uncommon with records only from Denmark and Belgium (Pollet 2011); in the latter country it is known only from a single site, l'étang de Virelles (Grootaert *et al.* 1988). It is likely, therefore, that a significant proportion of the world population is to be found in Britain. This restricted distribution and comparative rarity and vulnerability led Falk and Crossley (2005) to regard *D. laticola* as endangered and an RDB1 species, and this resulted in it being included on the list of UK BAP Priority Species (Natural England 2011).

The present account describes the discovery of the first British population of *D. laticola* found away from the Norfolk Broads in recent times, its current conservation status and distribution, and some aspects of the habitat preferences and ecology of this species.

Methods and results

During 2010, a number of habitat types at Walberswick National Nature Reserve (NNR), Suffolk were sampled as part of a study to investigate the habitat affinities of Dolichopodidae and their significance as bioindicators, following the work of Marc Pollet, summarised in Pollet (2009). Eight habitat types were investigated, wet woodland, dry woodland, grazing marsh, fen, reedbed, heathland, saltmarsh and saline lagoon; each sampling site consisting of a large homogeneous area of that particular broad habitat type and with all sampling sites

separated by at least 250m. The Dolichopodidae from each habitat type were sampled using six water traps per habitat installed at surface level; each trap consisted of a rectangular white plastic tray 250mm x 175mm and 60mm in depth (≅ 2.5l), three-quarters filled with 25% propylene glycol. Detergent (about 0.5ml per litre of water) was added, so that captured insects wet quickly and sink. The traps were set on 29 April 2010 and were in continuous operation until 4 September 2010. At no more than two weekly intervals, all material was collected from the traps and later sorted and identified. All specimens are stored in 70% alcohol and are housed in the author's collection. Species identities were confirmed by Roy Crossley.

The moisture content of the substrate of each habitat type was obtained by taking soil samples from the direct vicinity of the traps. Average percentage water content was calculated after drying for 36 days at room temperature. Samples were taken on 10 July 2010.

Specimens of *D. laticola* were collected from only two habitat types, fen and wet woodland between 22 May 2010 and 7 August 2010 (Table 1). No *D. laticola* were collected from the reedbed or any of the other habitats sampled. A total of 134 specimens (62 males and 72 females) of *D. laticola* were collected (see Table 1). *Dolichopus laticola* constituted 7.5% of the total catch of 1406 dolichopodids from the fen habitat, and 0.7% of the total catch of 4217 dolichopodids from wet woodland.

Table 1. Numbers and collection date of *Dolichopus laticola* (Verrall, 1904) from wet woodland and fen habitats at Walberswick NNR during 2010.

	Date of collection							
	22 May	3 June	12 June	26 June	10 July	24 July	7 August	Total
Wet woodland	-	9	4	14	3	1	-	31
Fen	1	4	15	51	28	3	1	103

The fen sampled (TM4673) is the largest (approx 1ha) of three plots of this habitat on the edge of Westwood Marshes near to Fen Covert. These fens have a very wet organic soil and a rich herb flora with areas of mud present. Management is by annual mowing. Across the fen, *Juncus subnodulosus* is abundant, the remaining flora including *Cirsium palustre, Juncus articulatus, Carex curta, Pedicularis palustris, Menyanthes trifoliata, Mentha aquatica* and *Equisetum fluviatile* (NVC, M22a *Juncus subnodulosus-Cirsium palustre* fen meadow, typical sub-community). The average moisture content of the substrate of the fen was 61.5%.

The wet woodland sampled (TM4673) is about 3.5ha in extent, it lies on the western edge of a *Betula pubescens* dominated woodland where it grades into marsh. This area is wet, with areas of standing water and mud present. The canopy is dominated by *Alnus glutinosa* with some *B. pubescens* and *Salix cinerea,* and the shrub layer by saplings of *A. glutinosa* and *B. pubescens.* The ground flora is dominated by *Phragmites australis* and *Carex riparia* (NVC, W2a *Salix cinerea-Betula pubescens-Phragmites australis* woodland, *Alnus glutinosa-Filipendula ulmaria* sub-community). Average moisture content of the substrate was 58.5%.

In the fen habitat *D. laticola* was found in association with 37 other dolichopodid species. The most abundant (>20 specimens) of these were, 289 *Ethiromyia chalybea* (Wiedemann, 1817), 179 *Telmaturgus tumidulus* (Raddatz, 1873), 136 *Syntormon pumilum*

(Meigen, 1824), 134 *Dolichopus picipes* (Meigen, 1824), 126 *D. nubilus* (Meigen, 1804), 112 *Campsicnemus scambus* (Fallén, 1823), 74 *Tachytrechus notatus* (Stannius, 1831), 38 *Chrysotus cilipes* (Meigen, 1804), 28 *Gymnopternus aerosus* (Fallén, 1823), 27 *Dolichopus campestris* (Meigen, 1824), 21 *D. atripes* (Meigen, 1804) and 21 *Syntormon monile* (Haliday in Walker, 1851). Less abundant species included *Achalcus cinereus* (Haliday, 1851), *Argyra vestita* (Wiedemann, 1817), *Campsicnemus picticornis* (Zetterstedt, 1843), *C. pusillus* (Meigen, 1824), *Chrysotus gramineus* (Fallén, 1823), *Dolichopus atratus* (Meigen, 1824), *D. excisus* (Loew, 1859), *D. lepidus* (Staeger, 1842), *Rhaphium auctum* (Loew, 1857), *R. monotrichum* (Loew, 1850), *Sciapus contristans* (Wiedemann, 1817) and *Syntormon denticulatum* (Zetterstedt, 1843).

In the wet woodland habitat *D. laticola* was found in association with 35 other species of dolichopodids. The most abundant (>20 specimens) of these were 880 *Campsicnemus scambus*, 808 *Dolichopus atripes* 530 *D. picipes* (Meigen, 1824), 514 *Gymnopternus aerosus,* 355 *Dolichopus atratus,* 319 *Gymnopternus cupreus* (Fallén, 1823), 203 *Dolichopus discifer* (Stannius, 1831), 141 *D. ungulatus* (Linnaeus, 1758), 129 *Ethiromyia chalybea,* 92 *Campsicnemus loripes* (Haliday, 1832), 79 *Gymnopternus metallicus* (Stannius, 1831), 40 *Campsicnemus curvipes* (Fallén, 1823), 30 *Argyra diaphana* (Fabricius, 1775). Less abundant species included *Achalcus cinereus*, *Dolichopus lepidus, D. longitarsis* (Stannius, 1831), *Poecilobothrus chrysozygos* (Wiedemann, 1817), *Rhaphium caliginosum* (Meigen, 1824), *R. monotrichum* and *Syntormon tarsatum* (Fallén, 1823).

The habitat preferences of the dolichopodid fauna of fen habitat contains species of humid heathland, *Telmaturgus tumidulus*, *Dolichopus atratus*, *D. lepidus*, species from wet woodland and reed marsh *Ethiromyia chalybea*, *Dolichopus picipes*, *D. atripes*, *Syntormon monile*, *Campsicnemus scambus*, *Argyra vestita*; woodland *Gymnopternus aerosus,* fen, grassland and open habitats *Chrysotus cilipes*, *Dolichopus campestris*, *Syntormon pumilum*, *Campsicnemus pusillus*, *Chrysotus gramineus* and from riparian habitats *Dolichopus nubilus*, *Tachytrechus notatus.* The habitat preferences of the wet woodland dolichopodid fauna consists of the typically wet woodland and marsh species, *Campsicnemus scambus*, *Dolichopus atripes*, *D. picipes, D. atratus, Ethiromyia chalybea,* and woodland species *Gymnopternus aerosus, G. cupreus, Dolichopus discifer*, *D. ungulatus*, *Campsicnemus loripes Gymnopternus metallicus* and *Argyra diaphana* (Pollet, Grootaert and Meuffels 1989, Pollet and Grootaert 1994, 1996, Pollet and De Bruyn 2000, Pollet 2000, 2001, Bernasconi *et al.* 2007).

Discussion

The UK BAP species *D. laticola* has only hitherto been recorded from the Bure catchment of the Norfolk Broads. However, these records from Walberswick NNR on the Suffolk coast during 2010 have added a second area to the known distribution of *D. laticola.* Aston (1954). mentioned an earlier Suffolk record of *D. laticola* by Claude Morley from Tuddenham Fen in 1904. Two specimens labelled as *D. laticola* from Tuddenham Fen from the Morley collection at Ipswich Museum were examined; unfortunately they were in poor condition and therefore the records could not be verified. River dredging and water abstraction at Tuddenham Fen has changed the ecology of the area and the fen probably does not continue to support *D. laticola* at present. However, these Suffolk records may suggest that *D. laticola* was once a more widespread wetland species and further East Anglian populations may yet be discovered.

The habitat requirements of *D. laticola* were described by Falk and Crossley (2005) as fen-meadow mown annually, and mixed fen with sedge-bed and some fen-carr. The Belgian

l'étang de Virelles record was from a *Filipendula ulmaria* marshland alongside a large shallow lake (Pollet *pers. comm.*). Results from this study are broadly in agreement with these statements, with specimens collected from both fen and wet woodland habitats. It was shown that there was a higher percentage of specimens and higher percentage of the total catch of Dolichopodidae from the fen habitat compared with wet woodland. This suggests that while fen may be the preferred habitat for *D. laticola*, wet woodland is also frequented. As this study did not investigate larval preferences of *D. laticola* it has not been possible to ascertain whether larval development occurs in only one of the habitat types or both, and because of the relative closeness of the two habitats it is not known whether larval development and adult residence corresponded exactly, or some element of adult migration occurs. Undoubtedly, *D. laticola* requires a very wet substrate for larval development, with both the fen and wet woodland habitats providing conditions of very high soil moisture content for at least part of the year. However, other factors differ, such as insolation levels, vegetation type and amounts of mud and standing water, that have been shown to influence dolichopodid assemblages and distributions (Pollet 1992).

Like most *Dolichopus* species, *D. laticola* appears to be univoltine. In this study the period of adult activity lasted for 7 weeks ranging from mid May to early August with a peak occurring in late June / early July. Compared to the other similar dark legged wetland *Dolichopus* species, the emergence is about four weeks earlier than *D. atratus, D. lepidus* and *D. picipes* but about two weeks later than *D. campestris* and four weeks later than *D. atripes*.

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Corrections and changes to the Diptera Checklist (26) – Editor

It is intended to publish here any corrections to the text of the latest Diptera checklist (publication date was 13 November 1998; the final 'cut-off' date for included information was 17 June 1998) and to draw attention to any subsequent changes. All readers are therefore asked to inform me of any errors or changes and I would like to thank all those who have already brought these to my attention. Changes are listed under families; names new to the British Isles list are in bold type. The notes below refer to addition of 7 species, resulting in a new total of **7051** species (of which 34 are recorded only from Ireland).

Mycetophilidae. P.J. CHANDLER (2011. *Fungus Gnat Recording Scheme Newsletter* **5,** 1-4. **In** Bulletin of the Dipterists Forum **72**) added the following species:
Mycetophila ***sublunata*** Zaitzev, 1998

Empididae. The placement of *Dryodromya* Rondani, 1856 in tribe Chelipodini is apparently in error, due to confusion with *Drymodromia* Becker, 1914, which does belong to that tribe. Sinclair and Cumming (2006), who were followed in the higher classification of Empididae, actually regarded *Dryodromya* as incertae sedis in Empididae, in the *Hesperempis* species group, rather than in subfamily Hemerodromiinae (Adrian Plant *pers. comm.*).

Phoridae. R.H.L. DISNEY (2011. *Triphleba dentata* Schmitz added to the British list (Dipt., Phoridae). *Entomologist's monthly Magazine* **147,** 125-129) added the following species:
Triphleba ***dentata*** Schmitz, 1943 (= *T. excisa*: Disney, 1983, misident. (male)).

The following species was added by R.H.L. DISNEY (2011. A new sibling species of *Megaselia spinigera* (Wood) (Dipt., Phoridae) from Europe. *Entomologist's monthly Magazine* **147,** 81-67):
Megaselia ***basseti*** Disney, 2011

The following additions result from R.H.L. DISNEY (2011. A new sibling species of *Megaselia discreta* (Wood) (Dipt., Phoridae) from the British Isles. *Entomologist's monthly Magazine* **147,** 55-60):
Megaselia ***crellini*** Disney, 2011
Megaselia ***nudiventris*** (Wood, 1909 – *Phora*) (raised from synonymy with *M. discreta*)

Syrphidae. In the present issue and following other recent works **MEGASYRPHUS** Dušek & Láska, 1967 is treated as of generic rank, not a subgenus of *Eriozona*, with one included species *M. erraticus* (Linnaeus, 1758), and *Chamaesyrphus* is treated as a synonym of *Pelecocera*, with transfer of its species (as *scaevoides* and *caledonica*) to that genus.

Conopidae. Usage of the name *Myopa testacea* has been confirmed in a ruling of the Commission (ICZN 2011. Opinion 2268 (Case 3473) *Conops testaceus* Linnaeus, 1767 (Currently *Myopa testacea*; Insecta, Diptera) conserved by the designation of a neotype. *Bulletin of Zoological Nomenclature* **68**(1), 86-89).

Sciomyzidae. L.V. KNUTSON and J.-C. VALA (2011. *Biology of snail-killing Sciomyzidae flies*. 550 pp. Cambridge University Press) have used **KNUTSONIA** Verbeke, 1964 as the name for subgenus *Tumidicercus* of *Ilione*, it having priority.

This work also recognised subgenera in *Pherbellia*, *Anticheta*, *Dichetophora*, *Sepedon* and *Tetanocera*, all British species falling in the typical subgenus in each case except in *Pherbellia* and *Tetanocera*. In *Tetanocera* British species belong to *Tetanocera* sensu stricto except for *T. robusta*, which is placed in S. **CHAETOTETANOCERA** Mayer, 1953. In *Pherbellia* the species are distributed as follows: S. **CHETOCERA** Robineau-Desvoidy, 1830: *albocostata*, *annulipes*, *dorsata*, *dubia*, *griseola*, *nana*, *pallidiventris*, *rozkosnyi*, *scutellaris*, *sordida*, *ventralis*; S. **DITAENIA** Hendel, 1902: *cinerella*; S. **OXYTAENIA** Sack, 1939: *brunnipes*, *knutsoni*, *stackelbergi*; S. PHERBELLIA sensu stricto: *schoenherri*. Unplaced: *argyra*, *goberti*.

Agromyzidae. The following species were added by K. BLAND (2011. Two new species of Agromyzidae (Diptera) mining the leaves of *Antennaria dioica* in the Scottish Highlands and Northern Ireland. *British Journal of Entomology and Natural History* **24,** 121-126):
Phytomyza ***antennariae*** Bland, 2011
Phytomyza ***heckfordi*** Bland, 2011

Changes to the Irish Diptera List (16) – Editor

This section appears as necessary to keep up to date the initial update of the Irish list in Vol. **10,** 135-146 and the recent checklist of Irish Diptera (Chandler *et al.* 2008). Species are listed under families, but with references listed separately. The additions cited below bring the total Irish list to **3352** species.

Agromyzidae

Phytomyza antennariae Bland, 2011 (added by Bland 2011: see above under *Corrections and changes to the Diptera Checklist*)

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