Gall midges (Diptera: Cecidomyiidae: Cecidomyiinae) of Germany – Faunistics, ecology and zoogeography

By Marcela Skuhravá, Václav Skuhravý & Hans Meyer

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Cover photo: Gall of *Wachtliella persicariae* Linnaeus, 1767
on *Polygonum aphibium* L. (Photo: H. Meyer)

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Content

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MARCELA SKUHRAVÁ, VÁCLAV SKUHRAVÝ & HANS MEYER

Abstract

This study summarises the results of investigations of the subfamily Cecidomyiinae carried out in Germany from the end of the 18th century to 2012. The present fauna of Cecidomyiinae in Germany includes 686 species in 123 genera. Germany is the country with the highest number of species of gall midges in Europe. An annotated list of all the species is presented and each species is characterised by its biology, occurrence in Germany and geographic distribution. A list of host plants and associated gall midges is given. On the basis of larval feeding habits, gall midges recorded in Germany can be divided into three biological groups: 87 % species are phytophagous, 5 % zoophagous, 3 % mycophagous and 5 % unknown. The two species-richest genera are *Dasineura* Rondani, 1840, with 149 species and *Contarinia* Rondani, 1860, with 97 species.

It is estimated that 160 species per 1000 km² occur in Germany. Based on this estimate, the species density in Germany is the second highest in Europe. 27.4 % of species are very rare, 17.6 % are rare, 11.5 % are intermediate, 22.3 % are frequent, 14.9 % are very frequent and 6.3 % are extremely frequent. *Mikiola fagi* and *Hartigiola annulipes,* both causing galls on *Fagus sylvatica* leaves, are the most frequent species in Germany.

Altitudinal distribution: Among the 168 species found in Bavarian Swabia 106 occur in the colline zone, 87 in the submontane and 60 in the montane zones. Species number decreases with increasing altitude with 14 species in both the subalpine and alpine zones. Most species (100) occur only in one altitudinal zone, 40 species in two, 16 in three, 7 in four and 5 in all five zones. *Contarinia campanulae* causing flower bud galls on *Campanula* spp., *Rhopalomyia hypogaea* inducing stem galls on *Leucanthemum atratum* and *Dasineura alpestris* causing leaf bud galls on *Arabis alpina* are typical representatives of the alpine zone. *Dasineura alpestris* and *Rhopalomyia hypogaea* occur at the highest altitudes of around 2000 m in the Allgäu Alps.

Geographic distribution: 75.9 % are European, 16.9 % Eurosiberian, 0.7 % Euroasian, 3.1 % Submediterranean or Mediterranean, 2.6 % Holarctic and 0.7 % alien species.

Relations to host plants: In Germany 616 gall midges are associated with 513 plant species belonging to 56 families respectively 221 genera. A large number of species is associated with Fabaceae (74 species), Asteraceae (67), Salicaceae (57), Poaceae (45), Rosaceae (42) and Fagaceae (31). Most of the species (387: 62.8 %) are associated with herbaceous plants and approximately a third (229: 37.2 %) with trees and shrubs. In the latter group, the highest numbers of gall midges species occur on three deciduous forest

trees: *Quercus robur, Q. petraea* and *Populus tremula* and the shrubs, *Salix aurita* and *Salix cinerea*.

Economic importance: Over the last 150 years about 47 gall midges species were recorded as pests of cultivated plants, forest trees and shrubs.

Occurrence in Germany: The following numbers of gall midge species are recorded for: Bavaria 328, Baden-Württemberg 139, Brandenburg and Berlin 358, Hesse 207, Lower Saxony and Bremen 117, Mecklenburg-Western Pomerania 286, North Rhine-Westphalia 251, Rhineland-Palatinate 157, Saarland 83, Schleswig-Holstein and Hamburg 297, Saxony-Anhalt 206, Saxony 225 and Thuringia 266.

The following taxonomic changes were made: *Arthrocnodax tanaceti* KIEFFER in RÜBSAAMEN-HEDICKE 1925-1939 is now a junior synonym of *Arthrocnodax jaapi* RÜBSAAMEN, 1921; *Placochela ligustri* (RÜBSAAMEN, 1899) is not conspecific with *Placochela nigripes* (F. LÖW, 1877) and *Mycodiplosis plasmoparae* RÜBSAAMEN, 1906 is not conspecific with *Mycodiplosis inimica* (FITCH, 1861) and must be regarded as a separate species.

Keywords: Diptera, Cecidomyiinae, faunistics, zoogeography, distribution, economic importance, plant-animal relations, Germany, Europe, Palaearctic Region, new synonymies; new combinations

Zusammenfassung

Die Gallmücken (Diptera: Cecidomyiidae: Cecidomyiinae) Deutschlands - Eine Faunistisch-ökologische und zoogeographische Studie

In dieser Studie werden die Forschungsergebnisse über die Unterfamilie Cecidomyiinae vom Ende des 18. Jahrhunderts bis zum Jahr 2012 für Deutschland zusammengestellt. Gegenwärtig umfasst die Gallmückenfauna Deutschlands 686 Arten aus 123 Gattungen. Deutschland ist das Land mit der höchsten Artenzahl an Gallmücken in Europa Eine kommentierte Liste aller Gallmückenarten charakterisiert jede Art bezüglich Biologie, Vorkommen in Deutschland und geographischer Verbreitung. Eine Liste der Wirtspflanzen mit den an ihnen lebenden Gallmückenarten ergänzt die biologischen Angaben.Aufgrund der larvalen Ernährungsweisen lassen sich bei den Gallmücken Deutschlands drei biologische Gruppen unterscheiden: 87 % phytophag, 5 % zoophag, 3 % mycophag und 5 % mit unbekannter Biologie. Die zwei artenreichsten Gattungen sind *Dasineura* RONDANI, 1840 mit 149 und *Contarinia* RONDANI, 1860 mit 97 Arten. Artendichte: Im Durchschnitt kommen 160 Arten pro 1000 km² in Deutschland vor. Deutschland liegt damit an zweiter Stelle aller Länder Europas.

Häufigkeit: 27,4 % der Arten sind sehr selten, 17,6 % selten, 11,5 % in mittlerer Häufigkeit, 22,3 % häufig, 14,9 % sehr häufig und 6,3 % extrem häufig. *Mikiola fagi* und *Hartigiola annulipes*, die beide Gallen an den Blättern von *Fagus sylvatica* verursachen, sind die häufigsten Gallmückenarten in Deutschland.

Höhenstufen-Verteilung: Von 126 in Bayerisch Schwaben nachgewiesenen Arten kommen 106 Arten in der kollinen, 87 Arten in der submontanen und 60 Arten in der montanen Höhenstufe vor. Mit ansteigender Höhe nehmen die Artenzahlen ab und erreichen in der subalpinen und alpinen Höhenstufe einen Wert von jeweils 14 Arten. Die meisten Arten (100) kommen nur in einer Höhenstufe vor, 40 Arten in zwei, 16 in drei, 7 in vier sowie 5 Arten in allen fünf Höhenstufen. Typische Arten sind in der in der alpinen Zone z.B.: *Contarinia campanulae* mit Blütenknospengallen an *Campanula* spp., *Rhopalomyia hypogaea* mit Stengelgallen an *Chrysanthemum atratum und C. leucanthemum* sowie *Dasineura alpestris* mit Blattknospengallen an *Arabis alpina. Dasineura alpestris* und

Rhopalomyia hypogaea kommen in den höchsten Höhenstufen von ca. 2000 m in den Allgäuer Alpen vor.

Geographische Verbreitung: 75,9 % sind europäische, 16,9 % eurosibirische, 0,7 % euro-asiatische, 3,1 % submediterrane oder mediterrane, 2,6 % holarktische und 0,7 % fremde Arten.

Beziehung zu Wirtspflanzen: In Deutschland nutzen Gallmücken 513 Wirtspflanzenarten, die zu 221 Gattungen aus 56 Familien gehören. Eine grosse Anzahl von Arten lebt an Fabaceae (74 Arten), Asteraceae (67), Salicaceae (57), Poaceae (45), Rosaceae (42) und Fagaceae (31). Die meisten Arten (387: 62,8 %) leben an Krautpflanzen, ein geringerer Anteil (229: 37,2 %) an Bäumen und Sträuchern. Drei Laubbaumarten - *Quercus robur, Q. petraea, Populus tremula* und die Sträucher *Salix aurita* und *Salix cinerea* erreichen die höchste Artenzahl.

Ökonomische Bedeutung: Im Zeitraum der letzten 150 Jahre wurden ungefähr 47 Gallmückenarten als Schadinsekten an Kulturpflanzen, z. B. krautige Pflanzen, Forstbäume und Sträucher, festgestellt.

Vorkommen in Deutschland: Folgende Artenzahlen wurden für die einzelnen Bundesländer festgestellt: Bayern: 328, Baden-Württemberg: 139, Brandenburg und Berlin: 358, Hessen: 207, Niedersachsen und Bremen: 117, Mecklenburg-Vorpommern: 286, Nordrhein-Westfalen: 251, Rheinland-Pfalz: 157, Saarland: 83, Schleswig-Holstein und Hamburg: 297, Sachsen-Anhalt: 206, Sachsen: 225 und Thüringen: 266 Arten.

Es wurden folgende taxonomische Änderungen vorgenommen: *Arthrocnodax tanaceti* KIEFFER in RÜBSAAMEN-HEDICKE 1925-1939 ist ein Junior-Synonym von *Arthrocnodax jaapi* RÜBSAAMEN,1921; *Placochela ligustri* (RÜBSAAMEN, 1899) ist nicht identisch mit *Placochela nigripes* (F. LÖW, 1877) und muss als eigenständige Art angesehen werden; *Mycodiplosis plasmoparae* RÜBSAAMEN, 1906 ist nicht identisch mit *Mycodiplosis inimica* (FITCH, 1861) und muss ebenfalls als eigenständige Art angesehen werden.

Stichwörter: Diptera, Cecidomyiinae, Faunistik, Zoogeographie, Verbreitung, ökonomische Bedeutung, Pflanze-Tier Beziehungen, Deutschland, Europa, paläarktische Region, neue Synonymien, neue Kombinationen

1 Introduction

The Cecidomyiidae belong to one of the species richest families of Diptera. In their catalogue, GAGNÉ & JASCHHOF (2014) list 6203 species in 736 genera of living and fossil gall midges in the world. In total, 3113 species in 344 genera are described for the Palaearctic Region with about 1800 species in 270 genera for Europe (SKUHRAVÁ 2006). Based on modern taxonomical studies there are six subfamilies, i.e. Catotrichinae, Cecidomyiinae, Lestremiinae s.str, Micromyinae, Porricondylinae s.str. and Winnertziinae in the family Cecidomyiidae (GAGNÉ & JASCHHOF 2014, JASCHHOF & JASCHHOF 2009, 2013).

The Cecidomyiidae are usually only 0.5-3 mm long and rarely reach sizes up to 8 mm. They have long antennae, relatively large wings with reduced venation and long legs. Larvae are phytophagous, mycetophagous or saprophagous. Some larvae are zoophagous. Larvae of phytophagous species cause galls (Latin: cecidium) on various organs of host plants (hence the common name „gall midges") or live free within flower heads or stems of plants and do not induce galls (MAMAEV 1975, SKUHRAVÁ et al. 1984a, 1984b, SKUHRAVÁ 1997a).

Data on the occurrence of the family Cecidomyiidae in Germany were summarised for the first time by SKUHRAVÁ (1986) in the Catalogue of Palaearctic Diptera. According to

SKUHRAVÁ (1986) and SKUHRAVÁ et al. (1984a) there were 586 species of gall midges recorded in the German Federal Republic and 406 species in the German Democratic Republic. The German checklist published by MEYER & JASCHHOF (1999) includes 836 species. Between 1998 and 2013 many new species and genera of the subfamilies Lestremiinae s. lat. and Porricondylinae s. lat. were described by JASCHHOF (1998, 2003) and JASCHHOF & JASCHHOF (2009, 2013), respectively, but only one new species for the subfamily Cecidomyiinae (SKUHRAVÁ & DENGLER 2001).

This paper focuses on the subfamily of Cecidomyiinae. JASCHHOF & JASCHHOF (2009, 2013) have published lists for other subfamilies. The majority of the species in the subfamily Cecidomyiinae have close associations with plants by inducing specific galls or as inquilines in galls of other species. Collecting galls from different host plants and determining the imaginal stages that emerge from these galls is the best way to identify these gall midges and associated inquilines. A minor part of the Cecidomyiinae have free living, zoophagous or mycophagous larvae, respectively, and all species of the other five subfamilies have fungivorous larvae, which do not induce galls on plants.

Appropriate methods for collecting these species in various types of biotopes are, for example sweep netting, use of Möricke dishes and water traps, Malaise traps and emergence traps. Thus the method of studying gall midges of the subfamily Cecidomyiinae and the other five subfamilies is quite different.

The altitude in Germany ranges from sea level in the north up to mountains of nearly 3000 m high (Zugspitze: 2,962 m). Distributional analyses, thus, have to consider not only the climatic gradient from North to South, but also the vertical gradient from the northern plains to the southern alpine zones. Due to the long tradition of studying gall midges in Germany, many species were described for this country during the last two centuries.

The present updated and enlarged list summarises the knowledge on the biology, ecology and faunistics and presents a zoogeographical analysis of all species of the subfamily Cecidomyiinae recorded in Germany over a period of about 240 years, from 1776 to 2013.

2 History

Dipterology began in Sweden with CARL LINNAEUS (1758), who described two gall midge species: *Tipula juniperina* (L. 1758) (now: *Oligotrophus juniperinus*) and *Tipula persicariae* (L. 1767) (now: *Wachtliella persicariae*) that both occur in Germany.

In the second half of the 18th century, SCHRANK (1776) was the first German who published a short description of a gall midge, *Tipula flava* (now: *Monarthropalpus flavus*). At the beginning of the 19th century, four and two species were described by SCHRANK (1803) and MEIGEN (1803, 1804), respectively. These three researchers, Linnaeus, Schrank and Meigen, can be regarded as the founders of dipterology in Europe and the world.

According to EVENHUIS (2010) 365 dipterologists in Germany have described Diptera over the last 236 years. Thus, Germany is on the fourth place of the 26 countries considered. The USA with 828 authors is on the first place followed by China with 626 and UK with 376 authors. From 1770 to 2010, 370 new species of the subfamily Cecidomyiinae were described by forty dipterologists in Germany and 50 % of the type localities of these species are in Germany.

During the first half of the 19th century about 20 gall midge species were described. After this period F. H. Loew summarized the knowledge at that time and presented descriptions of 35 new species of gall midges (LOEW 1850). Three years later WINNERTZ

(1853) published a monograph, which included descriptions of 75 species of gall midges, some of which were later found to be conspecific with Loew´s species.

During the second half of the 19th and first half of the 20th century 170 new species of gall midges were described, mostly by E. H. Rübsaamen. At that time, he was the leading authority on gall midge taxonomy and described 35 new genera and 168 species between 1889 and 1921.

In the second half of the 20th century 78 new species were described. H. Stelter described 36 species of adult gall midges, which emerged from galls collected in Mecklenburg-Western-Pomerania, Brandenburg and Thuringia, Möhn 30 species also reared from galls collected throughout Germany, HOLZ (1970) six mycophagous species, ERTEL (1975) three *Mayetiola*-species, MEYER (1984, 1985) two *Mayetiola*- and one *Procystiphora*-species.

The galls on plants caused by gall midges were of particular interest to many researchers, mainly botanists and mycologists. The shape, origin and occurrence of plant galls were studied as early as 1830. The first descriptions of plant galls were included in the descriptions of gall midges published by BOUCHÉ (1834), SCHWÄGRICHEN (1835), HARTIG (1839) and RATZEBURG (1841). In KALTENBACH's (1874) book on insects as enemies of plants, insect pests are listed under the German names of the host plant genera and families. This book is a very important handbook and source of knowledge on plant galls, and includes the first key for identifying plant galls. RUDOW (1875a) reported the plant galls occurring in northern Germany along with their insect causers. Subsequently, KARSCH (1877) revised the gall midges, THOMAS (1878) published an article on new plant galls occurring on 42 host plants, VON SCHLECHTENDAL (1883, 1891) articles on plant galls in Germany and HIERONYMUS (1890) summarized the knowledge on plant galls („Zoocecidien") in Europe.

At the beginning of the 20th century, two important articles on plant galls, their origin, development, structure and shape were published by ROSS (1903, 1904). KÜSTER (1911) included his knowledge on plant galls in a manual and ROSS (1911) published a book on plant galls of Central and Northern Europe, including an account of the biology of their insect causers and a key for identifying the galls. This book was important for all subsequent studies on plant galls, because it enabled researchers to identify plant galls. It included also the species of gall midges that were described by Rübsaamen. ROSS's (1911) book was soon out of print. Therefore, ROSS & HEDICKE (1927) published a new, extended and improved edition. Together with a methodological handbook for cecidology (ROSS 1932) this book was the basis for two volumes subsequently published by BUHR (1964, 1965), including keys for the identification of plant galls of Central and Northern Europe.

The most active period of cecidological investigations and studies in Germany was the first half of the 20th century. JAAP (1918-1928) published his investigations on plant galls from several parts of Germany. He reared adults of many insects inducing galls and sent them to Rübsaamen for description. RÜBSAAMEN (1915) named one genus (*Jaapiella*) and several species in his honour. The following researchers collected plant galls in various parts of Germany during the first half of the 20th century: VON LAGERHEIM (1903), KRÖBER (1910), SCHULZ (1911), HEDICKE (1917a, 1917b, 1917-1918), ROSS (1916, 1922c, 1922d), TOEPFER (1918), BUHR (1929, 1930, 1939), MARESQUELLE (1931), WENGENMEYER (1931), SCHLEICHER (1935), LUDWIG (1935), LANGE (1936), BERGER (1936), NIESSEN (1928, 1937, 1938), ZELLER (1940, 1941, 1942), RAPP (1942), and WEIDNER (1950). In the second half of the 20th century the following researchers contibuted to the knowledge on plant galls: WEIDNER & WEIDNER (1951), KRÖBER (1956), WEIDNER (1962), BUHR (1960, 1966), HUBER (1969a, 1969b, 1974), HAASE & UTECH (1971), SCHRÖPPEL (1980-1984), UTECH

(1988a, 1988b), SKUHRAVÁ & SKUHRAVÝ (1988, 1992a, 1992b), PICHINOT & MEYER (1998), and OSCHMANN (2000).

In the following part short biographies of the researchers are presented who made important contributions to the knowledge on the subfamily Cecidomyinae in Germany. They are listed chronologically in terms of their year of birth (Fig. 1). The "Gallen-Herbar" of the Botanische Staatssammlung München, compiled by H. ROESSLER (1988) is a most valuable source for both the biographies of cecidologists in Germany and the locations of their collections.

Franz von Paula Schrank (*1747 Vornbach am Inn, † 1835 München), philosopher, natural scientist, botanist and entomologist, member of the Jesuitenkolleg Passau, founder and first director of the Botanischer Garten München from 1809 to 1832, professor of the Universität Landshut and a member of the Königliche Bayerische Akademie der Wissenschaften. He was the first to describe species of gall midges. In his book "Beiträge zur Naturgeschichte" published in 1776, he describes *Tipula flava* (now: *Monarthropalpus flavus*) and later seven species (at that time all in the genus *Tipula*), which were mainly from Bavaria, viz. *Tipula sisymbrii, T. salicis, T. oxyacanthae, T. tiliae, T. populea, T. rubi, T. nigricornis* (SCHRANK 1776, 1803).

Johann Wilhelm Meigen (*1764 Solingen in North Rhine-Westphalia, † 1845 Stolberg near Aachen), entomologist, who is regarded as the "father of dipterology" for his pioneer work on Diptera. He described a large number of European species of Diptera. His work laid the foundations of all later works on this insect group. He established two gall midge genera: *Itonida* MEIGEN, 1800: 19, with type species *Tipula pini* DE GEER (by subsequent designation of COQUILLETT 1910: 556), which was suppressed by ICZN 1963: 339, and *Cecidomyia* MEIGEN, 1803: 261, with type species *Tipula pini*. He described five species of gall midges from Germany: *Cecidomyia grandis, C. nigra, C. lutea, C. atra* and *C. albipennis*. The biology of these gall midges is unknown (MEIGEN 1800, 1803, 1804, 1818). Some of the types of Meigen´s gall midges are in the Muséum National d´Histoire Naturelle Paris.

Christian Friedrich Schwägrichen (*1775 Leipzig, † 1853 Leipzig), botanist and natural scientist, professor of botany and natural history at the Universität Leipzig, 1806 - 1835, and director of the Botanischer Garten Leipzig. He studied mainly mosses and described the species *Cecidomyia brachyntera* (now: *Thecodiplosis brachyntera*) that causes galls on pine needles (SCHWÄGRICHEN 1835).

Peter Friedrich Bouché (1785 - 1856 Berlin), botanist and entomologist. His collection is in the Senckenberg Deutsches Entomologisches Institut Müncheberg. He lived, worked and died in Berlin and described four species: *Cecidomyia artemisiae, C. bryoniae, C. pyri* and *C. tubifex* (BOUCHÉ 1834, 1847).

Karl Ludwig Friedrich von Roser (*1787 Vaihingen an der Enz, † 1861 Stuttgart), chief official, who lived in Tübingen (Baden-Württemberg). He described the species *Cecidomyia marginata* (now: *Haplodiplosis marginata*) (VON ROSER 1840). His collection of Diptera is in the Staatliches Museum für Naturkunde Stuttgart (BÄHRMANN 1999).

Johannes Winnertz (1800 - 1896 Krefeld), was an entomologist specialised in the study of Diptera. He was a shopkeeper in Krefeld in North Rhine-Westphalia. He published four articles on Diptera with descriptions of many new species. In his article "Beitrag zu einer Monographie der Gallmücken" (WINNERTZ 1853) he described 75 new species and one genus based on specimens collected in the neighbourhood of Krefeld. He reared some of these species from galls, but the majority was caught as adults. Their biology is, thus, unknown. Winnertz's collections of Diptera are in the Senckenberg Naturmuseum

Frankfurt am Main (BÄHRMANN 1999), Naturhistorisches Museum Wien and Zoologisches Forschungsmuseum Alexander Koenig Bonn. A part of his collection was destroyed during World War II.

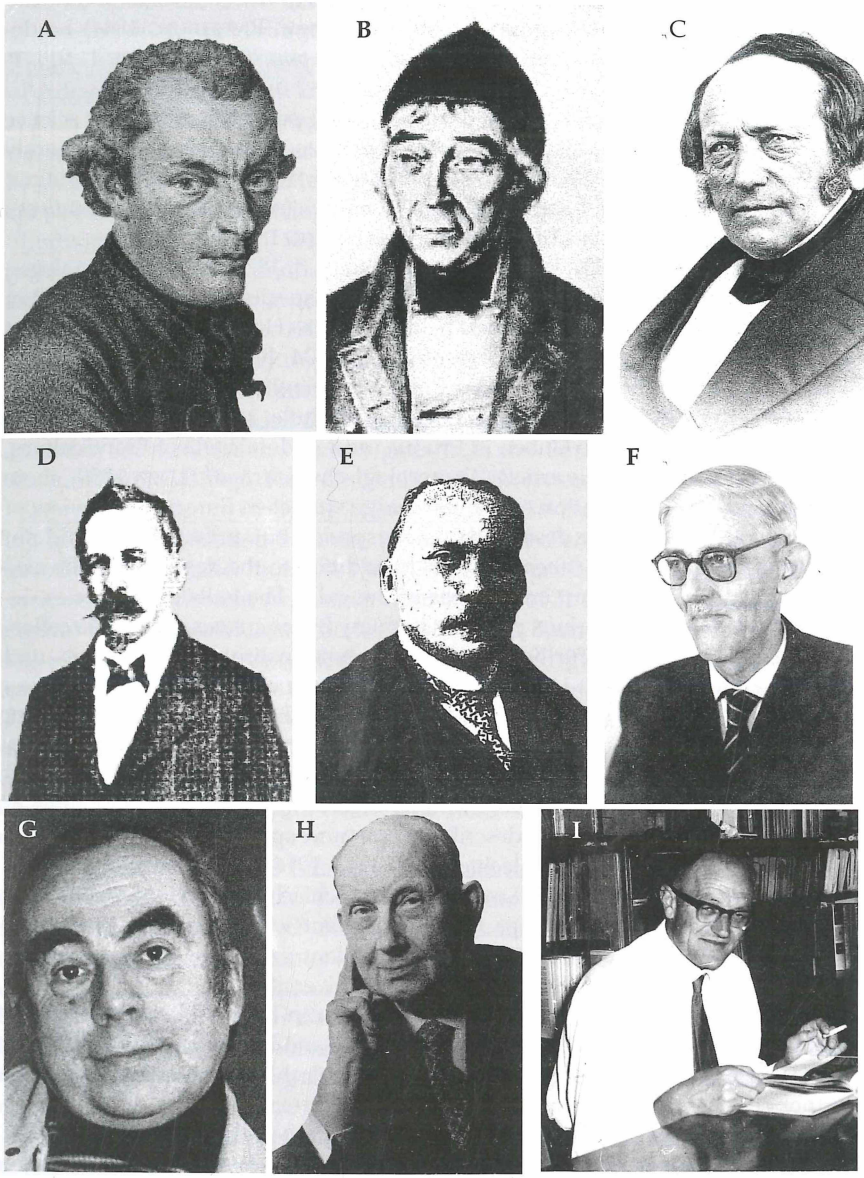

Fig. 1: Important Cecidomyiidae researchers: F. P. Schrank (A), J. W. Meigen (B), J. Winnertz (C), F. H. Loew (D), E. W. Rübsaamen (E), H. Buhr (F), E. Möhn (G), H. A. Weidner (H), H. Stelter (I).

Julius Theodor Christian Ratzeburg (1801 - 1871 Berlin), professor of forestry science at the Höhere Forstlehranstalt Eberswalde and founder of forest entomology. He published the first study on the biology of two gall midges that damage forest trees in Germany – *Cecidomyia pini* and *Thecodiplosis brachyntera* (RATZEBURG 1841), both associated with needles of *Pinus* spp. In his compendium on forest entomology (RATZEBURG 1844) he describes the biology and life cycles of six gall midges: *Tipula pini, T. brachyntera, T. fagi, T. annulipes, T. salicina* and *T. pyri.*

Theodor Hartig (*1805 Dillenburg, † 1880 Braunschweig), professor of forestry science of the Collegium Carolinum Braunschweig, botanist and zoologist. He studied mainly gall wasps (Hymenoptera: Cynipidae), but also described two species of gall midges: *Cecidomyia fagi* (now: *Mikiola fagi*) and *Cecidomyia annulipes* (now: *Hartigiola annulipes*), both of which induce galls on leaves of *Fagus sylvatica* (HARTIG 1839).

Friedrich Hermann Loew (*1807 Weissenfels in Saxony, † 1879 Halle), entomologist who specialized in Diptera. He described several hundred species from various parts of the world, but mainly Europe, North America and Africa. He was the most famous dipterologist in the second half of the 19th century. In 1834, he was appointed senior teacher at the Friedrich-Wilhelms-Gymnasium in Posen (now Poland: Poznan) and in 1850-1868 he was the director of the Königliche Realschule Meseritz (now Poland: Medzyrecze). In 1868, he moved to Guben in Prussia (now: federal state of Brandenburg, near the border with Poland). In his article "Dipterologische Beiträge" (LOEW 1850), there is an excellent analysis and evaluation of the gall midge studies in Europe and review of the species known at that time. He described 35 new species, but, unfortunately, did not include records of the localities for these species. In addition to the descriptions, he also recorded the name of the host plant and shapes of the galls. The galls of 14 species described by Loew were found in various parts of Germany by later researchers. His collection of Diptera is in the Museum für Naturkunde – Leibniz-Institut für Evolutions- und Biodiversitätsforschung Humboldt-Universität, Berlin (BÄHRMANN 1999).

Johann Heinrich Kaltenbach (*1807 Köln, † 1876 Aachen), botanist and entomologist, teacher at the gymnasium in Aachen (today: Rhein-Maas-Gymnasium). He is the author of the comprehensive book „Die Pflanzenfeinde aus der Klasse der Insekten" (KALTENBACH 1874), in which the pest-insects are arranged according to the German names of their host plant genera and families. He described seven new species of gall midges.

Diederich Herrman Reinhard von Schlechtendal (1834 – 1916 Halle), entomologist and son of the botanist Diederich Franz Leonhard von Schlechtendal (1794-1866). Von Schlechtendal studied mainly gall wasps (Cynipidae), but was also interested in the study of other gall inducing insects. His collection of plant galls is in the Museum für Naturkunde – Leibniz-Institut für Evolutions- und Biodiversitätsforschung Humboldt-Universität, Berlin and in the Institut für Zoologie Martin-Luther-Universität Halle-Wittenberg. He is the author of several pioneering papers and books on plant galls (VON SCHLECHTENDAL 1883, 1886, 1891, 1892, 1896, 1916). In Schlechtendals´s time, many gall inducing arthopods were unknown and subsequently discovered and described by specialists who worked on insect groups other than gall midges and eriophyid mites. For example, several gall midges reared from galls by Schlechtendal are described by E. H. Rübsaamen.

Heinrich Julius Adolph Robert Hartig (*1839 Braunschweig, † 1901 München), son of Theodor Hartig, mycologist, forest scientist at the Forstakademie Eberswalde and later professor of forest botany at the Ludwig-Maximilians-Universität München. He described the species *Cecidomyia piceae* (HARTIG 1893).

Friedrich August Wilhelm Thomas (*1840 Gotha, † 1918 Ohrdruf), zoologist and botanist, was a teacher in Ohrdruf (Thuringia) and often travelled to the Alps, where he collected galls induced by various insects. He published several papers on this subject and is the author of the term "cecidium" (THOMAS 1878, 1890a, 1890b, 1892, 1893). He compiled a list of the publications on plant galls and their causers in Germany (THOMAS 1911a).

Ferdinand Rudow (*1840 Eckartsberga, † 1920 Naumburg), entomologist who specialized on Hymenoptera. He was the head teacher in Perleberg (Brandenburg) and can be considered to be the founder of studies on plant galls in Germany. He is the author of the paper „Die Pflanzengallen Norddeutschlands und ihre Erzeuger" (RUDOW 1875a) and a review of galls occurring on *Tilia, Salix, Populus* and *Artemisia* (RUDOW 1875b).

Ludwig Geisenheyner (*1841 Potsdam, † 1926 Bad Kreuznach), botanist, teacher at the gymnasium in Herford and later in Bad Kreuznach. He studied the flora of Bad Kreuznach and published two articles about plant galls in the River Nahe region and Middle Rhine area (GEISENHEYNER 1902, 1913). In 1920 the Johann-Wolfgang-Goethe Universität, Frankfurt am Main, honoured Geisenheyner with the title Dr. h.c. for his excellent research on botany and cecidology. Geisenheyner cooperated with J. Niessen in compiling a list of plant galls recorded from the area of the River Rhine (NIESSEN 1928, 1937, 1938). Geisenheyner´s collection of plant galls is in the Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität, Berlin (NIESSEN 1928).

Georg Hans Emmo Wolfgang Hieronymus (*1846 Schöneiche/Neumarkt, † 1921 Berlin), natural scientist and botanist. He studied medicine and natural history in Zürich, Bern, Berlin and Halle. From 1874 to 1883 he was professor of botany at the Universidad Nacional de Cordoba in Argentina; from 1892 to 1921 custodian of the Botanischer Garten und Botanisches Museum Berlin-Dahlem and Botanisches Museum Universität Breslau, Silesia (now: Wroclaw, Poland). He obtained galls collected by friends, mainly teachers. He summarized various records on the occurrence of plant galls in Europe (HIERONYMUS 1890). In this work, he included also data on the distribution of galls of gall midges in Germany, which made it the most comprehensive overview on plant galls of Germany at that time. Hieronymus´s plant gall collection, which was continued by F. A. Pax, including 691 herbarium items, is in Ross´s gall collection in the Botanische Staatssammlung München (ROESSLER 1988).

Ferdinand Karsch (*1853 Münster, † 1936 Berlin), entomologist, graduated at the Friedrich-Wilhelms Universität, Berlin (now: Humboldt Universität, Berlin). In 1877, he wrote a dissertation entitled „Revision der Gallmücken" (KARSCH 1877), which he subsequently published (KARSCH 1878). Later, Karsch worked at the Zoologisches Museum der Friedrich-Wilhelms-Universität Berlin and after 1881 at the Landwirstchaftliche Hochschule, Berlin. He was the editor of the scientific journals "Berliner Entomologische Nachrichten" and "Entomologische Zeitschrift", and described several species of gall midges: *Rhopalomyia cristaegalli, R. tanaceticola* and *Contarinia steini*. KIEFFER (1891) dedicated the species *Rabdophaga karschi* and FELT (1908) the genus *Karshomyia* to Karsch.

Ewald Heinrich Rübsaamen (*1857 Haardt in Siegen, † 1919 Metternich near Koblenz), natural scientist, entomologist, cecidologist, art-teacher and excellent illustrator. E. H. Rübsaamen and J. J. Kieffer, the French entomologist, were the two main gall midge specialists in Europe at that time. In 1892, he started his scientific work at the Zoologisches Museum der Friedrich-Wilhelms-Universität, Berlin, where he studied gall midges and published his results illustrated by 270 excellent drawings of the morphological characters (RÜBSAAMEN 1892a). He identified plant galls collected by various people from Russia, Central Asia, Greenland, Balkan Peninsula, Persia, Canary and Madeira Islands, Bra-

zil, Africa, Trans-Baikal and Australia and published these results in several comprehensive papers (e.g. RÜBSAAMEN 1899a). From 1902 to 1919, he was the head of the department of the Rheinland Weinreben Phylloxera-Kontroll-Program Koblenz (Rhineland-Palatinate). Nevertheless, between 1889 and 1921, Rübsaamen continued his work on the taxonomy of gall midges and published 36 papers (the last paper was published after his death), in which he described 35 new genera and 168 new species. He worked not only on galls and gall-inducing gall midges, but also on the biology of mycophagous and zoophagous gall midges. Rübsaamen collected galls induced by gall midges in various parts of Germany and reared their causers. His friend Otto Jaap sent adults of gall midges reared from galls collected in Germany to Rübsaamen for identification and description. RÜBSAAMEN (1915) established the gall midge genus, *Jaapiella*, and named several gall midges in honour of O. Jaap. An extensive book on the gall midges and their galls recorded in Germany based on material prepared by Rübsaamen was published after his death by H. Hedicke (RÜBSAAMEN & HEDICKE 1925-1939). Included in this book are 485 species of gall midges belonging to 125 genera recorded at that time for Germany, together with descriptions of their galls illustrated by 102 figures in the text and 760 colour drawings on 42 plates of gall midge galls, cross sections of galls, gall midge adults and some morphological characters of males, females, larvae and pupae. In addition, it includes a list of 200 host plants with short descriptions of galls of unknown gall midges. In 1912, Rübsaamen was honoured by the title Prof. h.c. for his excellent research in cecidology and was elected a member of the Leopold Carl Academie für Naturwissenschaften in Halle in 1917 (now: Deutsche Akademie der Naturforscher Leopoldina). More details about his life were published in an obituary, written by SCHAFFNIT (1928). Most of the types of Rübsaamen are deposited in the Museum für Naturkunde – Leibniz-Institut für Evolutions- und Biodiversitätsforschung Humboldt-Universität, Berlin, and others in the Staatliches Museum für Naturkunde, Stuttgart. The specimens are mainly in alcohol in small vials and some are mounted in glycerin on microscope slides. The museum in Berlin also houses a collection of galls of Rübsaamen (BÄHRMANN, 1999).

Nils Gustaf von Lagerheim (*1860 Stockholm, † 1926 Djursholm), Swedish botanist and mycologist, cecidologist, professor of botany at the Stockholms Universitet. He published descriptions of the galls of 14 species collected in the vicinity of Feldberg (Black-forest, Baden-Württemberg) (VON LAGERHEIM 1903).

Hermann Ross (*1862 Danzig, † 1942 München), botanist and cecidologist, conservator and head of the Phanerogamen-Herbar Botanisches Museum München. At first, he was professor of botany in Palermo (Sicily) and later custodian of the Botanischer Garten München. He published a series of important articles and books on cecidology, after studying plant galls, their origin, development, structure and shape (ROSS 1903, 1904, 1914, 1922a). Moreover, he published a large book on plant galls of Central and Northern Europe (ROSS 1911) with 233 original figures of galls drawn in the field by G. Dunzinger. After 16 years, a second improved and enlarged edition was published (ROSS & HEDICKE 1927) followed by a handbook on methods used in cecidology (ROSS 1932). Ross collected plant galls at many localities in Bavaria over a period of 20 years and summarized his results in "Die Pflanzengallen Bayerns" (ROSS 1916). Later, ROSS (1922c) summarized his studies of galls sent to him from various parts of Bavaria by his collaborators and collectors between 1916 and 1921. Ross´s plant gall collection, including more than 500 plant galls (Bavaria 440), is in the Botanische Staatssammlung München (ROESSLER 1988).

Ludwig Lange (1862 – 1938), botanist and chief gardener at the Biologisches Institut Naumburg (Saxony-Anhalt). He collected plant galls in the area of Naumburg and adjacent areas from 1919 and summarized his findings in LANGE (1936). His collection of

galls, which includes 1561 items, is in the Botanische Staatssammlung München and in the herbarium of Prof. O. Appel (ROESSLER 1988).

Otto Jaap (*1864 Triglitz/Prignitz, Brandenburg, † 1922 Hamburg), teacher in Jacobsdorf (Oberprignitz) and later at the school for girls in Hamburg. He had to retire at the age of 48 because of a serious heart problem. He was a modest scientist living in seclusion, but highly respected for his studies of fungi, lichens and mosses. The study of plant galls was his passion. He mainly studied galls of coccids and gall midges. In 1914, he travelled to Dalmatia and Istria in order to collect galls. He discovered galls of forty new species of gall midges, which he sent to his friend E. H. Rübsaamen. Jaap published results of his collecting of plant galls in several parts of Germany (Jaap 1918, 1919-1920, 1922, 1923, 1924, 1925, 1928). In 1910, he started to build up a large collection of plant galls called "Otto Jaap - Zoocecidien-Sammlung". It includes 846 herbarium items of host plants with galls and is arranged in 34 series, each of them accompanied by a list of numbered items. The obituary of O. Jaap was written by ROSS (1922b). The plant gall collection of O. Jaap is in Ross's plant gall collection in the Botanische Staatssammlung München (ROESSLER 1988).

Joseph Niessen (1864 - ?), teacher at the Gymnasium in Bonn. He collected galls of 52 gall midges in the area of the River Rhine and included in his paper also the records of other collectors (NIESSEN 1928, 1937, 1938). His collection of plant galls together with 138 items from A.Y. Grevillius´collection is in the Gallenherbar of Ross in the Botanische Staatssammlung München (ROESSLER 1988).

Robert Liebel (data unknown), forest scientist living in Karlingen (Lorraine), graduated at the Ludwig-Maxmilians Universität München where he studied under the leadership of Prof. R. Hartig. He published his dissertation on plant galls (LIEBEL 1892) and described five species: *Asphondylia mayeri, Cecidomyia stellariae, C. parvula, C. virgaeaureae* and *Hormomyia hartigi* (LIEBEL 1889, 1892).

Carl Leopold Escherich (*1871 Schwandorf/Oberpfalz, † 1951 München), zoologist and forest entomologist, professor of the Ludwig-Maxmilians Universität München. He was one of the founders of modern applied entomology and published handbooks on forest insects and a chapter on gall midges as forest pests (ESCHERICH 1942). His importance for forest and applied entomology was pointed out by SCHWENKE (1972).

Ernst Küster (*1874 Breslau, † 1953 Giessen), botanist, well known for his research on plant cells. In 1910, he finished his dissertation on the anatomy of plant galls (KÜSTER 1911). In 1920 he was appointed director of the Botanisches Institut und Botanischer Garten Justus-Liebig Universität, Giessen. Küster made important contributions to the physiological and chemical processes associated with plant cell protoplasm. From 1903 to 1951 he was the editor of the „Zeitschrift für wissenschaftliche Mikroskopie". His studies influenced several later researchers who studied galls, their morphology and physiology and the cecidological processes in plant tissues.

Arno Albin Otto Rapp (1878 – 1953 Erfurt), teacher and dipterologist, who worked from 1919 in the Naturkundemuseum, Erfurt. He published the first monograph on Thuringian Diptera, which also includes faunistic and ecological data (RAPP 1942). His collection of Diptera was deposited in 1968 in the in the Museum der Natur Gotha Stiftung Schloss Friedenstein (BÄHRMANN 1999).

A. Ludwig (*1879 Potsdam, † 1964 Siegen), botanist and mycologist, and a teacher at the gymnasium in Forbach (Alsace) and later in Siegen. He collected plant galls in Siegerland in North Rhine-Westphalia and adjacent areas (LUDWIG 1935). His collection of plant galls is in the Botanische Staatssammlung München (ROESSLER 1988)

Otto Kröber (1882 - 1969 Hamburg), teacher and dipterologist who worked at the Zoologisches Museum, Hamburg. He cooperated with the Senckenberg Deutsches Entomologisches Institut in Müncheberg in identifying the Diptera in their collections and collected galls in Schleswig-Holstein and the vicinity of Hamburg (KRÖBER 1910, 1956).

Josef Haase (*1890 Markausch, Bohemia, † 1971 Halle), teacher, lepidopterologist and cecidologist. He was an expert on galls and leaf mines. Together with Lucie Utech, he collected galls and leaf mines near the Biologische Station Faule Ort in the National Park „Ostufer der Müritz" (Mecklenburg), where they recorded the galls of 72 gall midges (HAASE & UTECH 1971).

Hans Franz Paul Hedicke (*1891 Magdeburg, † 1949 Berlin, Wittenau), entomologist who worked from 1911 to 1948 at the Zoologisches Museum der Friedrich-Wilhelms-Universität, Berlin. He was a contributor to the series „Nomenclator animalium generum et subgenerum", member of the International Commission of Zoological Nomenclature and editor of the journal „Märkische Tierwelt. Zeitschrift für die faunistische Erforschung der Kurmark", of which four volumes were published between 1934 and 1941. In 1948 he was appointed professor at the Humboldt-Universität, Berlin, where he lectured on nature conservation. Galls induced by various insects were his main interest. He collected galls mainly in the surroundings of Berlin (HEDICKE 1917a, 1917b, 1917-1918) and cooperated with Prof. Ross on a new edition of Ross´ 1911 publication (ROSS & HEDICKE 1927). After the death of E. H. Rübsaamen, H. Hedicke collected the unpublished material and drawings of Rübsaamen and published it subsequently over a period of fourteen years in the journal „Zoologica" (RÜBSAAMEN & HEDICKE 1925-1939). The small part of Hedicke´s collection that survived destruction in World War II is in the Museum für Naturkunde – Leibniz-Institut für Evolutions- und Biodiversitätsforschung Humboldt-Universität, Berlin. More details about his life and scientific activities were published by KÖNIGSMANN (1971).

Hugo Schleicher (1892 – 1951), entomologist working in Zoologisches Museum, Hamburg. He contributed to the knowledge of gall midges in Schleswig-Holstein, Lower Saxony and Mecklenburg-Western Pomerania (SCHLEICHER 1935).

Henri Jean Maresquelle (1898 – 1977), French cecidologist, who was appointed head of the Institut Botanique de Strasbourg in 1943 after the death of C. Houard. He continued the scientific work of the late C. Houard and studied mainly the anatomy, histology, physiology and ultrastructure of plant galls. In 1931 during a field trip he recorded many galls in the surroundings of Giessen in Hesse (MARESQUELLE 1931).

Josef Anton Huber (*1899 Landshut, † 1974 Dillingen), botanist and entomologist, professor of biology and anthropology at the Philosophisch-Theologische Hochschule, Dillingen near Augsburg. He collected galls on various plants in the Bavarian Regierungsbezirk Schwaben and published his results together with records of previous collectors (HUBER 1969a, 1969b, 1974). More details about his life and scientific activities can be found in his obituary, written by KARL (1976).

Herbert Buhr (*1902 Teterow, † 1968 Mühlhausen), botanist, phytopathologist and mycologist, one of the most important German cecidologists. From 1929-1936 he worked at the Botanisches Institut, Universität Rostock and from 1936 to 1941 was professor of botany and pharmacognosy there. After 1946, he worked first as a researcher and later as head of the Institut für Pflanzenzüchtung, Groß Lüsewitz near Rostock. From 1954 – 1961 he was director of the Forschungszentrum Mühlhausen in Thuringia. He went on several expeditions to Dalmatia, Corsica and Cameroon. His area of research was very broad and included plant diseases caused by viruses, bacteria and fungi, nematode con-

trol and insect pests. He was interested in the interactions between parasites and their host plants (BUHR 1937). Buhr also studied galls and mines. He discovered many galls of unknown origin and sent them to his collaborators for descriptions. Some of the insects that induced the galls and mines collected by him were named in his honour. Buhr published many scientific articles. His main work comprises two volumes with keys for the identification of plant galls: "Bestimmungstabellen der Gallen (Zoo- und Phytocecidien) an Pflanzen Mittel- und Nordeuropas" (BUHR 1964, 1965). This work influenced many researchers in Europe to study plant galls and is still a reliable source of knowledge on plant galls. Currently, Hans Roskam (University of Leiden, the Netherlands) is translating Buhr´s books into English. H. Buhr collected galls mainly in Mecklenburg-Western Pomerania (BUHR 1929, 1930, 1939), Saxony (BUHR 1966) and Thuringia (BUHR 1960). He initiated the studies of Helmut Stelter on gall midges, who later described several species of gall midges that were reared from galls by H. Buhr. The extensive herbarium of H. Buhr was in the Minenherbar from 1963 and then since 1968 in the Gallenherbar in Senckenberg Museum für Naturkunde, Görlitz (BÄHRMANN 1999). More details about H. Buhr´s life and scientific activities are in obituaries written by STELTER (1968) and HAASE (1968).

Dora Godan (1909 - 2006 Berlin), entomologist. She worked in the Zoologische Abteilung Biologische Zentralanstalt Berlin-Dahlem. She studied various aspects of the applied entomology of the gall midges *Dasineura affinis, Hartigiola annulipes* and *Dasineura brassicae* (now: *D. napi*), and the interactions between gall midges and their host plants (GODAN 1956a, 1956b, 1962).

Herbert Albrecht Weidner (1911 - 2009 Hof/Bayern), entomologist, professor of entomology and director of the Zoologisches Institut und Zoologisches Museum Universität Hamburg, author of 516 articles, mainly on gall wasps (Hymenoptera: Cynipidae). He published a review of the entomological collections (also plant gall collections) in the Zoologisches Museum, Hamburg (WEIDNER 1969, 1977). He contributed also to the knowledge of gall midges in Germany (WEIDNER 1950, 1952, 1958, 1960, 1962, 1985). Together with his wife, he published an article on plant galls occurring in the northwestern part of Bavaria (WEIDNER & WEIDNER 1951).Weidner´s collections of plant galls from the region around Hamburg, in particular, from Erlangen and Lower Franconia are in the Zoologisches Museum, Universität Hamburg (WEIDNER 1977: 120-121).

Adolf Schröppel (1906 – 1988), Oskar Klement (1897 – 1980) and Alfred Eschelmüller (1922 – ?), were amateur cecidologists. Between 1971 and 1984, they collected plant galls in the Algäu Alps in southwestern Germany and published several papers (ESCHELMÜLLER 1971, 1972, ESCHELMÜLLER & KLEMENT 1974, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, SCHRÖPPEL 1980, 1981, 1982, 1983, 1984).

Helmut Stelter (*1921 Hansfeld), phytopathologist and entomologist, specialized in the study of gall midges. From 1948 to 1950, he was head of the Bezirksstelle für Pflanzenschutz in Neustrelitz (Mecklenburg). From 1950 till his retirement, he worked at the Institut für Pflanzenzüchtung in Groß Lüsewitz later named Institut für Kartoffelforschung, Groß Lüsewitz near Rostock, which was a branch of the Deutsche Akademie für Agrarwissenschaften Berlin. He worked on problems of plant protection, mainly nematode pests of potatoes. The study of gall midges was his hobby. He cooperated with Prof. H. Buhr by identifying gall midges for him and, thus, became an outstanding expert on Cecidomyiidae in Central Europe. From 1954 to 1994, he described 30 new species and two genera of gall midges, and one of them, *Buhriella* STELTER, 1960, was named in honour of Prof. H. Buhr. He investigated mainly the species associated with various species of *Salix* and studied not only their morphology, but also their biology and interactions

with their host plants. In 1993, he summarised the most important results concerning the species associated with *Salix* and validated 15 species of European gall midges and listed their synonyms. H. Stelter published fifty articles on gall midges. On the occassion of his 67th birthday in 1988, the editorial staff of the journal „Beiträge zur Entomologie" published his biography, including a list of 33 publications (ANONYM 1988). His collection of gall midges (mounted in balsam on microscope slides) together with the „Gallenherbar Mitteleuropa" is in the Senckenberg Naturhistorische Sammlungen Dresden (BÄHRMAN 1999).

Max Postner (1921 – 2005), forest entomologist, professor at the Ludwig-Maximilian Universität, München, author of a chapter on gall midges associated with forest trees (POSTNER 1982). He studied mainly the biology, distribution and feasibility of controlling *Agevillea abietis* (now: *Paradiplosis abietispectinatae*), which was a serious pest of *Abies alba* at that time (POSTNER 1957, 1959a, 1959b, 1960a, 1960b, 1960c, 1962b, 1973a, 1973b, 1973c).

Edwin Möhn (*1928 Dauborn, † 2008 Stuttgart) was entomologist and gall-midge taxonomist, chief curator at the Staatliches Museum für Naturkunde, Stuttgart, professor of biology at the Universität Stuttgart. He studied at the Friedrich-Alexander Universität, Erlangen-Nürnberg where he carried out an excellent study on the comparative morphology and taxonomy of gall midge larvae, which was published in the journal "Zoologica" (MÖHN 1955a). He studied gall midge larvae obtained from various collections in museums of natural history in Europe and in his own collection of larvae from the surroundings of Dauborn (Taunus Mountains) and Erlangen. He recorded several new species for Germany (MÖHN 1954, 1955b, 1955c, 1955d, 1958, 1960a, 1960b, 1961a, 1961b). In 1956, Möhn spent a year travelling in El Salvador, where he recorded a large number of new species galling various plants, which he subsequently published in eight papers. He extensively worked on larvae of the family Cecidomyiidae for E. LINDNER's: Die Fliegen der palaearktischen Region (MÖHN 1966-1971). He described in detail the morphological characters of the larvae of six genera of the supertribe Lasiopteridi (*Baldratia, Hybolasioptera, Lasioptera, Ozirhincus, Stefaniola* and *Trotteria*) and described 47 species new to science only on the basis of larvae, often using very small morphological differences. Subsequently many of these species were synonymised with other species. The publication of MÖHN (1966-1971) remained unfinished. In 1968, Möhn was appointed professor at the Universität Stuttgart. From 1981 to 1993, he was head of the Department of Entomology in the Staatliches Museum für Naturkunde, Stuttgart. He is the author of 26 publications on gall midges published between 1954 and 1975. He described 250 species of gall midges new to science, mainly from El Salvador (Central America). After 1975 he finished his studies on gall midges and then focused on problems of systematics and phylogeny. An obituary was published by TSCHORSNIG (2008). The collection of E. Möhn is in the Staatliches Museum für Naturkunde, Stuttgart (BÄHRMANN 1999).

Klaus Dengler (*1937 Wildberg/Calw), forester, later professsor for forest disease protection and entomology at the Hochschule für Forstwirtschaft (Rottenburg am Neckar). He studied the distribution and life cycles of the gall midge *Xylodiplosis nigritarsis* and its predator *Lestodiplosis xylodiplosuga* (DENGLER 2006, SKUHRAVÁ & DENGLER 2001). Over a period of several years he studied the interactions between forest trees, woodpeckers and the gall midge *Resseliella quercivora*. The larvae of *R. quercivora* develop in the cambium of many species of forest trees damaged by birds and induce cambium necroses, which on oaks are known as "oak cancer" or "T-disease". It is likely that this species causes similar disease on other trees, such as elms, beech and lime. He published a detailed study of the biology, ecology, distribution and harmfulness of this species (DENGLER 2004).

Bernhard Holz (*1940 Greifswald) is entomologist. He studied mycophagous gall midges and their host specificity at the Universität Stuttgart under the leadership of Prof. E. Möhn. He described several new mycophagous species and established three new genera: *Buhromyiella, Neoisodiplosis* and *Neomycodiplosis* (HOLZ 1970). The collection of B. Holz is in the collection of E. Möhn in the Staatliches Museum für Naturkunde, Stuttgart (HOLZ 1970).

Margarete Ertel (?), entomologist, studied at the Universität Stuttgart under the supervision of Prof. E. Möhn, where she studied gall midges of the genus *Mayetiola*. She described three new species of this genus (ERTEL 1975). The collection of M. Ertel is in the collection of E. Möhn, in the Staatliches Museum für Naturkunde Stuttgart (ERTEL, 1975).

Hans Meyer (*1945 Lübeck), entomologist and dipterologist worked at the Institut für Ökosystemforschung, Abteilung Angewandte Ökologie Christian-Albrecht Universität, Kiel until his retirement. He studied the gall midge fauna of Schleswig-Holstein, especially in salt marshes, on sea-dikes and in polders, using various trapping methods (MEYER 1984). His ecological studies in salt marshes in Schleswig-Holstein and Lower Saxony were mainly concerned with the effect of different grazing intensities by cattle on the community of invertebrates in salt marshes (MEYER & REINKE 1996, MEYER et al. 1997). As part of his ecological investigations, he described three species of phytophagous gall midges new to science (MEYER 1984, 1985). Together with V. B. Pichinot, he summarised the studies of earlier researchers on phytophagous Diptera in Schleswig-Holstein and compiled a list of 269 species of gall midges (PICHINOT & MEYER 1998). Together with M. Jaschhof, he published the first checklist of gall midges for Germany (MEYER & JASCHHOF 1999), which includes 836 species, i.e. 23% of all Nematocera known from Germany. This list was compiled using the data of the Catalogue of Palaearctic Diptera (SOÓS & PAPP 1986), in which the account of the family Cecidomyiidae is by SKUHRAVÁ (1986), and lists published by RÜBSAAMEN-HEDICKE (1925-1939) and BUHR (1964-1965).

The collection of gall midges (microscope slides) and material in alcohol together with galls, originating mainly from Schleswig-Holstein, is in the Zoologisches Forschungsmuseum Alexander Koenig, Bonn. Further voucher material (microscope slides only) that he used for his thesis (MEYER 1984) is in the Natural History Museum, London.

Marcela Skuhravá (*1934 Praha) and Václav Skuhravý (*1928 Kadov, Strakovice district), Czech entomologists, summarised the knowledge on gall midges in a small book "Gallmücken und ihre Gallen auf Wildpflanzen" (SKUHRAVÁ & SKUHRAVÝ 1963, 1973). They contributed to the knowledge on German gall midges based on their collections of gall midges in three areas in Germany: 90 species from Harz (SKUHRAVÁ & SKUHRAVÝ 1988), 69 species from Naturpark Fichtelgebirge (SKUHRAVÁ & SKUHRAVÝ 1992a) and 29 from Bayerischer Wald (SKUHRAVÁ & SKUHRAVÝ 1992b). In addition, they summarized the knowledge on gall midges associated with oaks in Europe (SKUHRAVÁ et al. 1998) and described gall midge larvae that prey on other gall midges on oak (SKUHRAVÁ & DENGLER 2001). M. Skuhravá identified 11 species of gall midges that were collected in caves in Rhineland-Palatinate/Saarland by WEBER (1995).

Taxa described in honour of German researchers

The following valid taxa of the subfamily Cecidomyiinae, occurring in Europe, were named in honour of German cecidologists:

- H. Buhr: two genera: *Buhriella* STELTER, 1960 and *Buhromyiella* HOLZ, 1970 and six species: *Bayeriola buhri* (MÖHN, 1958), *Jaapiella buhri* STELTER, 1975, *Lasioptera buhri* MÖHN,

1968, *Macrolabis buhri* STELTER, 1956, *Mayetiola buhri* ERTEL, 1975, *Mycodiplosis buhri* HOLZ, 1970

- L. Geisenheyner: one species: *Dasineura geisenheyneri* (KIEFFER, 1904)
- T. Hartig: one genus: *Hartigiola* RÜBSAAMEN, 1912 and one species: *Physemocecis hartigi* (LIEBEL, 1892)
- H. F. P. Hedicke: one species: *Jaapiella hedickei* RÜBSAAMEN, 1921
- O. Jaap: one genus: *Jaapiella* RÜBSAAMEN, 1915 and six species: *Arthrocnodax jaapi* RÜBSAAMEN, 1921, *Contarinia jaapi* RÜBSAAMEN, 1914, *Dasineura jaapi* (RÜBSAAMEN, 1914), *Jaapiella jaapiana* (RÜBSAAMEN, 1914), *Macrolabis jaapi* RÜBSAAMEN, 1915, *Rabdophaga jaapi* (RÜBSAAMEN, 1915)
- J. H. Kaltenbach: one genus: *Kaltenbachiola* HEDICKE, 1938
- F. Karsch: one genus: *Karshomyia* FELT, 1908 and one species: *Rabdophaga karschi* (KIEFFER, 1891)
- L. Lange: one species: *Dichodiplosis langeni* RÜBSAAMEN, 1910
- R. Liebel: one species: *Monodiplosis liebeli* (KIEFFER, 1889)
- F. H. Loew: one genus: *Loewiola* KIEFFER, 1896 and three species: *Dasineura loewiana* (RÜBSAAMEN, 1917), *Dasineura loewii* (MIK, 1882), *Oligotrophus loewianus* KIEFFER, 1909
- H. Ross: one species: *Dasineura rossi* (RÜBSAAMEN, 1914)
- E. H. Rübsaamen: six species: *Asphondylia ruebsaameni* KERTÉSZ, 1898, *Dasineura ruebsaameni* (KIEFFER, 1909), *Lasioptera ruebsaameni* MÖHN, 1968, *Neomycodiplosis ruebsaameni* HOLZ, 1970, *Rhopalomyia ruebsaameni* THOMAS, 1893, *Zygiobia ruebsaameni* STELTER, 1992
- D. H. R. von Schlechtendal: two species: *Contarinia schlechtendaliana* (RÜBSAAMEN, 1893), *Lathyromyza schlechtendali* (KIEFFER, 1886)
- H. Stelter: two species: *Dasineura stelteri* GAGNÉ, 2004, *Lasioptera stelteri* MÖHN, 1968
- F. A. W. Thomas: two species: *Dasineura thomasi* (KIEFFER, 1909), *Dasineura thomasiana* (KIEFFER, 1888)
- J. Winnertz: two species *Lestodiplosis winnertziae* KIEFFER, 1909, *Planetella winnertzi* (KIEFFER, 1898)

3 Study area

Germany is part of Central Europe and of the western Palaearctic Region. The total area is 357,021 km² with 349,223 km² terrestrial land and 7,798 km² water of the total. In the North, it is bordered by the North Sea and the Baltic Sea and in the South by the Alps, with the highest point at the Zugspitze, 2962 m a.s.l. The major rivers are the Rhine, Danube and Elbe. Germany shares borders with nine European countries: Denmark in the north, Poland in the east, Czech Republic in the south east, Austria and Switzerland in the south, France and Luxemburg in the southwest and Belgium and The Netherlands in the west. Germany is divided into 16 federal states.

Climate of Germany

Germany has a warm temperate humid mid-latitude climate. Westerly winds predominate throughout the year. They bring humid air from the Atlantic Ocean and mainly determine the rainfall in Germany. The oceanic influence, which weakens from the northwest to the southeast, is responsible for relatively mild winters and summers, which are not too hot. Occasionally, however, persistent high-pressure systems block the westerly flow and cause very cold winters and very hot and dry summers. The topography of Germany, with its uplands and flat landscapes, has a strong influence on the climate (Table 1). Temperature is determined by the altitude of the terrain and distance

from the sea. Precipitation is strongly determined by the position of the mountains relative to the main wind direction.The forced uplift on the windward side of a mountain enhances cloud formation and precipitation, whereas in the descending air on the leeward side clouds dissipate and the area there is relatively dry. Lowlands, notably sheltered basins, have a particularly warm, dry and sunny climate, whereas higher areas, like the mountain ridges, are characterised by cool, wet and cloudy conditions.

Table 1: Climatological data of German Federal States at different altitudes for the period 1981-2010 , 30-years-average of temperature [°C] and precipitation [mm]; n.e.: not evaluated; Data source: "Deutscher Wetterdienst", generated: 23.05.2013

German Federal State	Altitude			
	1-500 m	501-1000 m	1001-2000 m	> 2000 m
	Temperature-30-year-average [°C]			
Bavaria	7.6 - 9.8	6.7 - 9.0	n.e.	- 3.7
Berlin-Brandenburg	8.8 - 10.2			
Baden-Württemberg	8.5 - 11.0	6.6 - 8.4	n.e.	
Hesse	8.2 - 10.8	6.1 - 6.3		
Mecklenburg-Western-Pomerania	8.4 - 9.2			
Lower Saxony	8.4 - 9.9	6.3		
North Rhine-Westphalia	7.9 - 11.0	7.2		
Rhineland-Palatinate	8.1 - 10.6	n.e.		
Saarland	9.7 - 10.6			
Saxony	7.7 - 9.9	5.4 - 6.8		
Schleswig-Holstein	8.2 - 9.1			
Saxony-Anhalt	7.2 - 10.1	5.6		
Thuringia	7.2 - 9.6	5.6 - 7.7		
	Precipitation-30-year-average [mm]			
Bavaria	608 – 1534	719 - 1885	2019 - 2340	1978
Berlin-Brandenburg	483 – 683			
Baden-Württemberg	688 – 1684	746 - 2062	1896	
Hesse	601 – 1031	1097 - 1338		
Mecklenburg-Western-Pomerania	530 – 684			
Lower Saxony	608 – 1244	1365 - 1528		
North Rhine-Westphalia	688 – 1498	979 - 1229		
Rhineland-Palatinate	542 – 1126	827 - 1157		
Saarland	795 - 1143			
Saxony	562 - 917	739 - 1227		
Schleswig-Holstein	571 - 939			
Saxony-Anhalt	493 - 743	n.e.		
Thuringia	492 - 903	719 - 1306		

The part of Germany that experiences the mildest climate throughout the year is the Upper Rhine rift. The Elbe and Saale valleys leeward of the Harz Mountains and the Thuringian Forest also have a particularly warm and dry climate. The warmest area in winter is the Lower Rhine region due to both its low altitude and the proximity to the sea. In summer, the lowlands in the southern parts of East Germany are as warm as the

southwest as the climate there is more continental. The climate is particularly severe at high altitudes, notably on high plateaus, mountain tops and summits where the temperatures are low, precipitation high and winds strong. This is especially characteristic of the mountains of Harz, Black Forest and Bavarian Forest (HERBER-PFLÜGER 2013).

Biogeographical characterisation of Germany

Germany can be divided into two eco-regions: European-Mediterranean montane mixed forests and Northeast-Atlantic shelf marine. The majority of the territory is covered by arable land (34%), forest and woodland (30%), permanent pastures (13.4%) and about 12% urban areas.

Beech, oaks and other deciduous trees make up one-third of the forest trees. Conifers are increasing as a result of reforestation. Spruce and fir trees predominate in the upper parts of mountains, while pine and larch are found on sandy soils. Many species of ferns, flowers, fungi, and mosses occur in Germany.

The forests are mostly pine and mixed, with fir, spruce, beech, oak, sycamore, maple, horn- beam, ash, lime and elm. Vegetation changes distinctly with increasing altitude. The broadleaved forests in the lowlands change gradually into coniferous forests in the mountains.

The vegetation at the lower altitudes is rich in species composition and, therefore, many of the potential host plants of gall midges occur there. JÄGER & WERNER (2007) report that there are 2800 species of flowering plants in Germany.

From the biogeographical point of view, UDVARDY (1975) categorises the majority of Germany as a Middle European Forest Province, the north-western part as an Atlantic Province and the southernmost part as Central European Highland. NOIRFALISE (1987) gives a detailed classification of Germany based on its natural vegetation.

4 Material and methods

4.1 Gall midge records used in the list

We gathered data on the occurrence of Cecidomyiinae in Germany from articles of various researchers, published over a period of about 237 years, from the end of 18th century untill 2013. Most of the species of gall midges recorded in Germany were found by collecting galls from different host plants. Rearing of the imaginal stages from these galls was often the only way to verify the identity of the inhabitants of the galls and was the basis of the fundamental work of RÜBSAAMEN & HEDICKE (1925-1939) and several subsequent publications of e.g. BARNES, HARRIS, HOLZ, MEYER, MÖHN, POSTNER, ROSKAM, SKUHRAVÁ, SKUHRAVÝ and STELTER.

4.2 Identification, nomenclature and economic importance

Identification of the galls of gall midges is based on the keys of BUHR (1964-1965) and HOUARD (1908-1909, 1913). These fundamental publications were also used to verify older records of gall descriptions in the literature. Identification of gall midge larvae is based on MÖHN (1955a, 1966-1971) and adults on the keys to genera of SKUHRAVÁ (1997a). The nomenclature of gall midge species is based on GAGNÉ (2004) and GANGÉ & JASCHHOF (2014), the nomenclature of host plant species on TUTIN et al. (1964-1980), ROYAL BOTANIC GARDEN EDINBURGH (2001), BUNDESAMT FÜR NATURSCHUTZ (2011) and LAUBER & WAGNER (2001), and of fungi on the "Index Fungorum" (www.indexfungorum.org 2014). Nomenclature of Eriophyidae and Tarsomenidae (Acarina), Polyxenidae (Diplopoda), Limoniidae (Diptera), Adelgidae, Aphididae and Psyllidae (Hemiptera), Cynipidae and Braconidae (Hymenoptera) and Chrysopidae (Neuroptera) follows

DE JONG (2013). Nomenclature of Curculionidae and Scolitidae (Coleoptera) follows BÖHME (2005). The economic importance of gall midge species was assessed based on information in BARNES (1946a, 1946b, 1948a, 1948b, 1949, 1951, 1956), NIJVELDT (1969), SKUHRAVÝ & SKUHRAVÁ (1993, 1996), DARVAS et al. (2000) and SKUHRAVÁ & ROQUES (2000).

4.3 Annotated list of species of gall midges

Each gall midge species is briefly characterised by its biology together with the host plant species and family, the results of a geographical analysis in Germany and overall geographical distribution. Publications of the researchers, who reported the presence of a particular species in Germany, are cited in references at the end of each paragraph; the author´s names are here arranged chronologically. If the species was described on the basis of material collected in Germany, the name of the type locality is given.

4.4 Zoogeographical analysis of the German gall midge fauna

Data on the occurrence of gall midges are analysed from both the geographic and zoological points of view using methods outlined by SKUHRAVÁ (1980, 1987, 1991, 1994a, 1994b, 1997b) and briefly described below. The occurrence, using data on presence or absence of species in a single German federal state, refers to species richness and species density (species number per 1000 km^2).

Species density

Species density refers to the number of species per unit area. Here, it was calculated for the number of species for the total area of Germany and for each federal state as species per 1000 km^2. Using this method, the species densities of various parts of Europe are compared by SKUHRAVÁ & SKUHRAVÝ (2010a).

Species density of gall midges per 1000 km^2 was calculated using the formula of MACARTHUR & WILSON (1967):

$S = x/a^{0,25}$

S: number of species per 1000 km^2, x: number of species found in the country, a: area of the country in 1000 km^2.

Frequency of occurrence in German federal states

The species frequencies found in Germany were subdivided into six frequency groups based on their occurrence in the 13 federal states using the following terms: very rare (recorded from 1 federal state), rare (2), intermediate (3), frequent (4-7), very frequent (8-11) and extremely frequent (12-13). Using the above categories, the number of localities and the local abundance of a species within one federal state were ignored. Species recorded only for "Germany", without referring to a specific federal state, were associated with the first frequency group (15 species). This definition of frequency was selected, because after 1980 only a few studies on frequencies were performed. In addition, the plant gall collectors and their area of research are listed.

4.5 Altitudinal distribution

For the analysis of the altitudinal distribution the definitions of ELLENBERG (1978) were used (see also SKUHRAVÁ & SKUHRAVÝ 2010a). Each of these zones is indicated by different factors, mainly climate and the composition of the vegetation.

In Central Europe the following eight altitudinal zones were distinguished: planare zone (from sea level-200 m a.s.l.), colline (200-500 m a.s.l.), submontane (500-900 m a.s.l.),

montane (900-1500 m a.s.l.), subalpine (1500-1700 m a.s.l.), alpine (1700-2400 m a.s.l.), subnivale and nivale zones (over 2400 m a.s.l.).

A prerequisite for an analysis of the altitudinal distribution is a record of the altitude of each of the localities where species of gall midges were found. There are valuable data for such analyses in articles of HUBER (1969a, 1969b, 1974) and SCHRÖPPEL (1980, 1981, 1982, 1983, 1984) who collected large numbers of galls from the "Regierungsbezirk Schwaben" in Bavaria. Both authors recorded the exact localities and mostly also the altitudes of the places where galls were collected. Using the data of Huber and Schröppel, it was possible to analyse the altitudinal distribution in the area of "Schwaben" from the colline to alpine zone. Missing altitudinal data for localities were obtained from the internet.

4.6 Geographic distribution within the Palaearctic region

The species occurring in Germany were classified, based on their geographic distribution, into seven zoogeographical types (SKUHRAVÁ 1987, 1997b, SKUHRAVÁ & SKUHRAVÝ 1993a, b):

- European: Centres of distribution in Europe.
- Eurosiberian: Abundant in Europe and extending at least to Western Siberia with a few species reaching the Far East.
- Euroasian: Species occur in Europe, reach to the Mediterranean Sea and western Asia, Turkey, Armenia and Kazakhstan.
- Submediterranean or Mediterranean: South-European species occurring mainly around the Mediterranean Sea and (or) associated with species of host plants whose centres of origin are in the Mediterranean region. In Germany, most of these species are at the northern border of their distribution.
- Holarctic: Some of them are primarily European or Eurosiberian according to their origin, but occur secondarily in the Nearctic Region. Usually they were transferred or introduced into the Nearctic Region.
- Cosmopolitan: originally distributed in the Palearctic, but introduced into many parts of the world, e.g. *Mayetiola destructor* (SKUHRAVÁ et al. 1984b).
- Alien: non-native in Germany, not originating from Europe, introduced probably with plant seedlings or seed from other parts of the world.

4.7 Relationships between gall midges and their host plants

Only those host plant species and associated gall midges whose occurrence is well documented for Germany were included. Species listed as "species probably also occurs in Germany" were excluded. For polyphagous species of gall midges, only the most frequent and the most important plant species were listed (e.g. for *Contarinia nasturtii, Dasineura napi, Lasioptera carophila* and *Kiefferia pericarpiicola*).

The number of plant genera with associated gall midges and all the species of plants of these genera occurring in Germany were used to calculate the percentage of host plants for each plant family exploitated by gall midges. This data can be obtained from the BUNDESAMT FÜR NATURSCHUTZ (2011).

The economical importance of gall midges and their effect on host plants is defined as follows: serious pests cause great harm to their host plants, which may result in their death; major pests harm their host plants but do not kill them; minor pests only slightly harm their host plants (DARVAS et al. 2000, SKUHRAVÁ & ROQUES 2000, SKUHRAVÝ & SKUHRAVÁ 1993, 1996).

4.8 Occurrence of gall midges in German federal states

In the case of faunal investigations, we give the names of the collectors of the plant galls, dates of their publications together with number of species of gall midges recorded and the name of the area studied. For each German federal state we summarise the results both in terms of the species richness and the species density (number of species per 1000 km^2).

4.9 Taxonomical problems

Although the gall midge fauna of Germany is well known, some important taxonomical problems remain to be solved. About 170 plant galls, recorded in Germany, are caused by undescribed gall midges. Their descriptions are based only on the galls as the adult stages of these gall midges are unknown (RÜBSAAMEN & HEDICKE 1925-1939, BUHR 1964, 1965). Kieffer´s descriptions of gall midges are usually very short, mostly referring to the shape of galls, whereas the adults and larvae are unknown (KIEFFER 1909). This situation is complicated by the fact that J. J. Kieffer´s collection of gall midges appears to have been lost and revisions, based on his material are impossible. Therefore, it is necessary to find new material of these galls, to rear adults and to redescribe these insufficiently documented species.

The situation for the species of the genus *Lestodiplosis* is similarly complicated. The species rich genus is respresented in the Palaearctic Region with 90 species. Many of the species were already described by Winnertz and Rübsaamen (SKUHRAVÁ 1986, 2006). Larvae of *Lestodiplosis* are zoophagous and prey on different athropods, such as larvae of other gall midges, beetles (scolityds), psyllids, butterflies and mites or attack insects living in rotten wood. The biology of species that were only caught in the field remains unknown. In the past each species of *Lestodiplosis* has been considered to be monophagous and specifically associated with its prey, but this seems to be wrong. Thus, problems exist concerning their taxonomy and prey specificity. To solve these problems a revision of the morphological characters of adults and larvae regarding the variability of species and experiments on their prey specificity are needed.

A verification of species recorded from plant galls often needs additional rearings. The identification of many species based only on the study of herbarium material was often not possible. At present, the list aimed only to document the present knowledge of gall midge occurrences in Germany based on the records in the literature and our own findings.

5 Results

The annotated list comprises species of the subfamily Cecidomyiinae found in Germany over a period of 237 years, from 1776 to present (2013). The fauna of gall midges in Germany and other countries in Europe are compared, regarding species richness, species density, frequency, altitudinal and geographical distribution, relation to host plants and economic importance. Furthermore, the species of gall midges occurring in the different German federal states are listed separately in chapter 5.8.

5.1 Annotated list of species of gall midges

In Germany the present fauna of the subfamily Cecidomyiinae includes 686 species in 123 genera. In comparision with the German checklist of MEYER & JASCHHOF (1999), which includes 653 species, nine species are deleted and 42 added to the current list.

The following nine species, which were included in the checklist of MEYER & JASCHHOF (1999), were excluded from the present list:

- *Arceuthomyia valerii* (TAVARES, 1904) (syn. *Oligotrophus oxycedri* RÜBSAAMEN, 1915). RÜBSAAMEN (1915) described *Oligotrophus oxycedri* associated with *Juniperus oxycedrus* L. on the basis of material collected by O. Jaap in southern Europe (probably in Yugoslavia). There is no evidence that this species occurs in Germany. The citation "Deutschland" in combination with the reference to RÜBSAAMEN in POSTNER 1982: 303 is incorrect. This species now belongs in the genus *Oligotrophus* (HARRIS et al. 2006).
- *Bremia centaureae* (KIEFFER, 1909); in the genus *Bremia* no species with the name *centaureae* exists. KIEFFER (1909) described the species *Perrisia centaureae* (now: *Dasineura centaureae*) associated with *Centaurea montana* L., which occurs in Austria and Switzerland, but not in Germany.
- *Coniophora graminicola* NIJVELDT, 1959. Larvae develop in inflorescences of *Phalaris arundinacea* L. (Poaceae). This species is included in the list of MEYER & JASCHHOF (1999), but its occurrence is not supported by a citation in the literature.
- *Contariia lepidii* KIEFFER, 1909. This species causes galls on *Lepidium draba* L. Galls were found by RÜBSAAMEN (1895e) in the Crimea (now Ukraine), but not in Germany.
- *Dasineura hyssopi* (KIEFFER, 1909). BUHR (1964-1965: No. 3405) mentioned this species inducing galls on *Hyssopus* sp.: "Missbildung aus D. erwähnt". Probably it is a mistake. In his description, KIEFFER (1909) refers to VON FRAUENFELD (1855). He found galls on *Hyssopus* sp. at Castelnuovo (Dalmatia, now Croatia). *Hyssopus* is a herbaceous plant native to southern Europe, the Middle East and the region surrounding the Caspian Sea. *D. hyssopi* evidently does not occur in Germany.
- *Dasineura ribis* (BARNES, 1940). This species was reported by RÜBSAAMEN (1901: 128) as causing flower bud galls on *Ribes alpinum* L. at Tucheler Heide (now: Bory Tucholskie, in Poland). It is unknown in Germany.
- *Jaapiella cucubali* (KIEFFER, 1909) induces galls on *Cucubalus baccifer* L. It evidently does not occur in Germany. The locality of Rübsaamen´s species "Steinau an der Oder" is now located in Poland (Scinawa).
- *Lasiopteryx obfuscata* (MEIGEN, 1818). According to GAGNÉ & JASCHHOF (2014) is a nomen dubium. The type material is lost.
- *Resseliella lavandulae* (BARNES, 1953). This species was included in the checklist of MEYER & JASCHHOF (1999), probably because of the type locality given in SKUHRAVÁ (1986: 284), who referred to BARNES (1953). The host plant *Lavandula angustifolia* MILL. does not occur in Germany and, thus, *R. lavandulae* also does not occur in Germany.

The following 14 species are included in the present list because Germany is recorded, but the federal state is unknown. Their records are based on publications of RÜBSAAMEN-HEDICKE (1925-1939), BUHR (1964-1965) and other researchers. They only cited the locality or area "Germany", "It occurs in Germany", or "The gall is known from Germany". These species are: *Aphidoletes urticaria, Arthrocnodax mali, Contarinia chrysanthemi, Dasineura axillaris, D. cytisi, D. fairmairei, D. fusca, D. pratensis, D. sampaina, D. tetrahit, D. teucrii, Janetia cerris, Lestodiplosis variegata,* and *Rabdophaga triandraperda.*

Acericecis campestre HARRIS, 2004

Larvae develop in small depressions on the underside of leaf galls of *Acer campestre* L. (Aceraceae). The gall was observed, desribed and illustrated already by F. LÖW (1885) in Austria. One generation develops per year. HARRIS (2004a) described this species based on the larva. Occurrence: very rare (THOMAS 1892, 1902). Distribution: European.

Acericecis vitrina (KIEFFER, 1909)

Perrisia vitrina KIEFFER, 1909; *Harrisomyia vitrina* (KIEFFER, 1909)

White larvae cause round pustule galls on leaves of *Acer pseudoplatanus* L. (Aceraceae). SKUHRAVÁ & SKUHRAVÝ (1986) redescribed this species. One generation develops per year. Occurrence: very frequent (ROSS 1922c, JAAP 1924, 1925, LUDWIG 1935, BUHR 1966, HUBER 1969b, SCHRÖPPEL 1984, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000). Distribution: European.

Acodiplosis inulae (LOEW, 1847)

Larvae cause galls on stem, leaf buds and flower heads of *Inula britannica* L. (Asteraceae). One or two generations develop per year. Larvae pupate in the galls. Occurrence: frequent (HEDICKE 1917-1918, BUHR 1939, SCHLEICHER 1935, ZELLER 1940, LANGE 1936). Distribution: European.

Amerhapha gracilis RÜBSAAMEN, 1914

Larvae live as inquilines in galls of the gall midge *Kiefferia pericarpiicola* (BREMI) on *Daucus carota* L. and other host plants of the family Apiaceae. Type locality: Berlin. One generation develops per year. Occurrence: very rare (JAAP 1918). Distribution: European.

Ametrodiplosis auripes (F. LÖW, 1888)

Larvae cause underground galls on *Galium mollugo* L. (Rubiaceae). Type locality: Stuttgart. One generation develops per year. Occurrence: intermediate (F. LÖW 1888, ROSS 1922c, JAAP 1918, WEIDNER 1958). Distribution: European.

Ametrodiplosis crassinerva (KIEFFER, 1901)

Larvae live in swollen flower buds of *Stachys sylvatica* L. (Lamiaceae). One generation develops per year. Occurrence: very rare (HUBER 1969b). Distribution: European.

Ametrodiplosis duclosii (TAVARES, 1930)

Larvae cause galls on axillary leaf buds on *Stellaria graminea* L. (Caryophyllaceae). One generation develops per year. Larva pupates in the gall. Occurrence: very rare (STELTER 1961). Distribution: European.

Ametrodiplosis thalictricola (RÜBSAAMEN, 1895)

Yellow larvae induce fruit galls on *Thalictrum flavum* L. (Ranunculaceae). Two generations develop per year. Occurrence: frequent (HIERONYMUS 1890, RÜBSAAMEN 1895d, ROSS 1916, HEDICKE 1917-1918, JAAP 1928, BUHR 1929, WENGENMAYR 1931, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, BUHR 1960). Distribution: Eurosiberian.

Anabremia bellevoyei (KIEFFER, 1896)

Larvae cause rolled leaf margins of *Lathyrus pratensis* L. (Fabaceae). Occurrence: frequent (ROSS 1922c, HEDICKE 1917-1918, JAAP 1918, BUHR 1939, STELTER 1992d, NIESSEN 1938). Distribution: European.

Anabremia massalongoi (KIEFFER, 1909)

Red larvae live in rolled, hypertrophied and decolourized leaflets of *Vicia villosa* ROTH (Fabaceae). Occurrence: very rare; BUHR (1965, #7518) mentioned that the gall is known also from Germany. Distribution: European.

Anisostephus betulinus (KIEFFER, 1889)

Larvae cause parenchymous galls on leaves of *Betula pubescens* EHRH. and *B. pendula* ROTH (Betulaceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: very frequent (HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, HAASE & UTECH 1971, SCHRÖPPEL 1981, KRUSE 2009, STAUDT 2013). Distribution: Eurosiberian.

Anthodiplosis rudimentalis (KIEFFER, 1901)

Larvae cause swollen flower buds of *Artemisia vulgaris* L. (Asteraceae). Occurrence: rare (STELTER 1989d, SCHMITZ 1996, 1998b). Distribution: European.

Antichiridium caricis (KIEFFER, 1898)
Larvae develop under the leaf sheaths of *Carex echinata* MURRAY (Cyperaceae). Occurrence: very rare (RÜBSAAMEN 1911). Distribution: European.
Antichiridium striatum (RÜBSAAMEN, 1910)
Larvae develop under the leaf sheaths of *Molinia coerulea* (L.) MOENCH (Poaceae). Occurrence: very rare (RÜBSAAMEN 1911). Distribution: European.
Aphidoletes abietis (KIEFFER, 1896)
Larvae prey on the aphid *Sacchiphantes abietis* (L., 1758) (Hemiptera: Adelgidae) on *Picea abies* (L.) KARSTEN (Pinaceae). Occurrence: very rare (MÖHN 1955a). Distribution: Holarctic.
Aphidoletes aphidimyza (RONDANI, 1847)
Cecidomyia cerasi LOEW, 1850; *Diplosis aphidivora* RÜBSAAMEN, 1891, *Diplosis aphidisuga* RÜBSAAMEN, 1891; *Cecidomyia napi* KALTENBACH, 1858
Larvae feed predaciously on many species of aphids (Hemiptera: Aphididae) on various host plants. There are several generations per year. Larvae pupate in cocoons. This species is used for biological control of aphids. WILBERT (1970, 1972, 1973) studied the biology of this species. Occurrence: very frequent (RÜBSAAMEN 1890a, MÖHN 1955a, MEYER 1984). Distribution: Holarctic.
Aphidoletes thompsoni MÖHN, 1954
Larvae are predators of the aphid *Dreyfusia piceae* (RATZ., 1844) (Hemiptera: Adelgidae) on the bark of *Abies alba* MILL. (Pinaceae). Type locality: Laimbach. Occurrence: rare (FRANZ 1955, MÖHN 1955a). Distribution: primarily Europe; it has been introduced into Canada and USA for biological control; at present Holarctic distribution.
Aphidoletes urticaria (KIEFFER, 1895)
Larvae are predators of the aphid *Aphis urticata* GMEL., 1790 and other genera and species of aphids (Hemiptera: Aphididae). Occurrence: very rare (HARRIS 1973 „in Germany"). Distribution: Holarctic.
Apiomyia bergenstammi (WACHTL, 1882)
Larvae cause woody, plurilocular galls on twigs of *Pyrus communis* L. (Rosaceae). One generation develops per year. Larvae hibernate in the galls and in spring they pupate in cocoons in the galls. Occurrence: very rare (BUHR H.J. 2013; Willschdorf: Saxony). Distribution: Mediterranean, southern Europe.
Arnoldiola gemmae (GIRAUD, 1868)
Cecidomyia gemmae RÜBSAAMEN, 1891 (GAGNÉ 2004: 71)
Larvae live as inquilines in galls of the gall wasp *Andricus foecundatrix* (HARTIG, 1840) (Hymenoptera: Cynipidae) on *Quercus petraea* (MATT.) LIEBL. (Fagaceae) and pupate there in white cocoons. Type locality: Berlin. Occurrence: rare (RÜBSAAMEN 1891b, MÖHN 1955a). Distribution: European.
Arnoldiola libera (KIEFFER, 1909)
White larvae produce very small, rounded leaf galls on *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). Only one larva develops per gall. Occurrence: intermediate (HEDICKE 1917-1918, BUHR 1966, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.
Arnoldiola quercus (BINNIE, 1877)
White larvae live as inquilines in galls of the gall midge *Contarinia quercina* (RÜBS.) on *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). Occurrence: intermediate (RÜBSAAMEN 1890a, HEDICKE 1917-1918, PFÜTZENREITER & WEIDNER 1958). Distribution: European.
Arnoldiola sambuci (KIEFFER, 1901)

White larvae live as inquilines in flower bud galls of the gall midge *Placochela nigripes* (LOEW) on *Sambucus nigra* L. (Caprifoliaceae). Occurrence: very rare (ROSS 1916, WENGENMAYR 1931, HUBER 1969b). Distribution: European.

Arthrocnodax incanus (RÜBSAAMEN, 1890)

Diplosis incana RÜBSAAMEN, 1890

Larvae were observed on leaves of *Populus tremula* L. (Salicaceae) together with the gall midge larvae of *Dasineura populeti* (RÜBS.). Type locality: Siegen. Occurrence: rare (RÜBSAAMEN 1890a). Distribution: European.

Arthrocnodax jaapi RÜBSAAMEN, 1921

Arthrocnodax tanaceti KIEFFER, in RÜBSAAMEN & HEDICKE 1925-1939: p. 35, Fig. 27g: larva; p. 48, Fig. 38d: spatula, anal segment of larva: **syn. nov.**

RÜBSAAMEN (1921) described *Arthrocnodax jaapi* on the basis of adults reared from orange-yellow larvae developing in flower-heads of *Tanacetum vulgare* L. (Asteraceae). Type locality: Triglitz/Prignitz. In RÜBSAAMEN & HEDICKE (1925-1939) only the name „*Arthrocnodax tanaceti* KIEFFER" is given, together with figures of larva, larval spatula and anal segment of larva. There is any record of such name in Kieffer´s papers. There is no description, any data on the biology. Data in RÜBSAAMEN & HEDICKE evidently refer to the species *Arthrocnodax jaapi*. Occurrence: rare (RÜBSAAMEN 1921, SKUHRAVÁ & SKUHRAVÝ 1992a). Distribution: Eurosiberian.

Arthrocnodax mali KIEFFER, 1926

Larvae are predators of the mite *Aculus schlechtendali* (NALEPA, 1890) (Acarina: Eriophyidae) on leaves of *Malus domestica* BORKH. (Rosaceae). Occurrence: very rare (WISSMANN 1926). Distribution: European.

Arthrocnodax minutus (WINNERTZ, 1853)

Cecidomyia minuta WINNERTZ, 1853

Biology unknown. A single male was caught. Type locality: Krefeld. Occurrence: very rare (WINNERTZ 1853). Distribution: European.

Arthrocnodax peregrinus (WINNERTZ, 1853)

Cecidomyia peregrina WINNERTZ, 1853

Red-yellow larvae live in galls caused by eriophyid mites (Acarina: Eriophyidae) on leaves of *Prunus spinosa* L (Rosaceae) and *Salix aurita* L. (Salicaceae). Type locality: Krefeld. Occurrence: intermediate (WINNERTZ 1853, SACK 1907, SCHLEICHER 1935, MÖHN 1955a). Distribution: European.

Arthrocnodax vitis RÜBSAAMEN, 1895

Larvae are predators of mites *Colomerus vitis* (PAGENSTECHER, 1857) (Acarina: Eriophyidae) on leaves of *Vitis vinifera* L. (Vitaceae). Each larva pupates in a cocoon on the leaf. Type locality: Rhembsohl. Occurrence: rare (RÜBSAAMEN 1895b, 1906). Distribution: Submediterranean.

Arthrocnodax wissmanni KIEFFER, 1924

Larvae are predators of mites *Aculus schlechtendali* (NALEPA, 1890) (Acarina: Eriophyidae) living on the lower side of leaves of *Malus domestica* BORKH. (Rosaceae). Type locality: Geisenheim. Occurrence: rare (KIEFFER 1924). Distribution: European.

Aschistonyx carpinicolus RÜBSAAMEN, 1917

Yellow larvae live in irregularly curled young leaves of *Carpinus betulus* L. (Corylaceae). Type locality: Triglitz/Prignitz. Occurrence: very frequent (ROSS 1922c, RÜBSAAMEN 1917, HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1929, 1939, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936. WEIDNER & WEIDNER 1951, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.

Asphondylia baudysi VIMMER, 1937

Solitary orange larvae cause swelling on pods of *Coronilla varia* L. (Fabaceae). Occurrence: intermediate (ROSS 1916, WEIDNER 1952). Distribution: European.

Asphondylia coronillae (VALLOT, 1829)

Asphondylia jaapi RÜBSAAMEN, 1915

Orange larvae cause swellings on pods of *Coronilla emerus* L. (Fabaceae). Occurrence: rare (ROSS 1914, NIESSEN 1938). Distribution: Submediterranean.

Asphondylia cytisi FRAUENFELD, 1873

Orange larvae produce galls on buds of *Cytisus nigricans* L. (Fabaceae). Occurrence: rare (RÜBSAAMEN 1892b). Distribution: Eurosiberian.

Asphondylia echii (LOEW, 1850)

Orange coloured larvae develop in flower buds of *Echium vulgare* L. (Boraginaceae) and change them in galls. Occurrence: frequent (SACK 1907, ROSS 1914, 1916, 1922c, WEIDNER & WEIDNER 1951, BUHR 1966, UTECH 1988a, 1988b). Distribution: Submediterranean.

Asphondylia ervi RÜBSAAMEN, 1895

Yellow larvae cause galls on pods of *Vicia sylvatica* L. and *V. hirsuta* (L.) S.F.GRAY (Fabaceae). Type locality: St. Goar. Occurrence: frequent (RÜBSAAMEN 1895d, MÖHN 1955a, BROMM 1964). Distribution: Eurosiberian.

Asphondylia genistae (LOEW, 1850)

Asphondylia moraviae VIMMER, 1928

Orange coloured larvae produce swellings on pods of *Genista germanica* L. and *G. tinctoria* L. (Fabaceae). Occurrence: frequent (SACK 1907, ROSS 1916, 1922c, LANGE 1936, SCHLEICHER 1935). Distribution: European.

Asphondylia hornigi WACHTL, 1880

Larvae develop in swollen fruits of *Origanum vulgare* L. (Lamiaceae). Occurrence: very rare (MÖHN 1955a). Distribution: European.

Asphondylia lathyri RÜBSAAMEN, 1914

Larvae produce swellings of the pods of *Lathyrus pratensis* L. (Fabaceae). Usually two generations develop per year. Occurrence: very rare (RÜBSAAMEN 1914, MÖHN 1955a). Distribution: Eurosiberian.

Asphondylia lupulinae KIEFFER, 1909

Larvae cause galls on axillary leaf buds on *Medicago lupulina* L. (Fabaceae). Only gall is described. Occurrence: rare (BUHR 1966). Distribution: European.

Asphondylia melanopus KIEFFER, 1890

Yellow larvae cause swellings on the pods of *Lotus corniculatus* L. (Fabaceae). Occurrence: frequent (ROSS 1914, 1916, JAAP 1918, SCHLEICHER 1935, MÖHN 1955a, PICHINOT & MEYER 1998). Distribution: European.

Asphondylia menthae KIEFFER, 1902

Gisonobasis ignorata RÜBSAAMEN, 1916

Orange coloured larvae develop in flower buds of *Mentha arvensis* L. (Lamiaceae). Attacked buds are swollen and do not open. Occurrence: very rare (V. SCHLECHTENDAL 1896). Distribution: Submediterranean.

Asphondylia miki WACHTL, 1880

Orange coloured larvae cause galls on pods of *Medicago sativa* L. and *M. falcata* L. (Fabaceae). It is a minor pest of alfalfa in the central and southern Europe (DARVAS et al. 2000). Occurrence: intermediate (LEHMANN 1934, LANGE 1936, BOLLOW 1954: among pests). Distribution: Eurosiberian.

Asphondylia ononidis F. LÖW, 1873

Asphondylia frauenfeldi KIEFFER, 1909

Yellow larvae form galls formed of thickened stipules or pod galls on *Ononis spinosa* L. (Fabaceae). Occurrence: frequent (ROSS 1916, 1922c, LANGE 1936, MÖHN 1955a, BUHR 1966, LUDWIG 1974, OSCHMANN 2000). Distribution: Submediterranean.

Asphondylia pilosa KIEFFER, 1898

Ischnonyx pilosa RÜBSAAMEN, 1916

Larvae cause slender and pointed, densely haired galls on axillary buds of *Cytisus scoparius* (L.) LINK (Fabaceae). Occurrence: very rare (RÜBSAAMEN 1916, ROSS 1916, NIESSEN 1938). Distribution: European (HARRIS 2002), immigrant in North America (GAGNÉ 2004, GAGNÉ & JASCHHOF 2014).

Asphondylia pruniperda RONDANI, 1867

Asphondylia prunorum WACHTL, 1880

Reddish yellow larvae cause leaf bud galls on *Prunus spinosa* L. (Rosaceae). Occurrence: frequent (V. SCHLECHTENDAL 1883, KIEFFER 1889, ROSS 1916, HEDICKE 1917a, LUDWIG 1935, BUHR 1930, 1939, 1966, SCHLEICHER 1935, BROMM 1964). Distribution: European.

Asphondylia sarothamni (LOEW, 1850)

Asphondylia mayeri LIEBEL, 1889

Larvae cause bud or pod galls on *Cytisus scoparius* (L.) LINK (Fabaceae). Two generations develop per year: hibernating generation in the buds, summer generation in the pods. Pupation takes place in the galls. RICHTER-VOLLERT (1964) studied its morphology and ecology. Occurrence: extremely frequent (RÜBSAAMEN 1890a, SACK 1907, JAAP 1918, 1923, 1924-1925, 1928, ROSS 1914, 1916, BUHR 1929, 1939, 1966, LUDWIG 1935, SCHLEICHER 1935, ZELLER 1942, WEIDNER 1950, WEIDNER & WEIDNER 1951, STELTER 1954, 1957, MÖHN 1955a, PICHINOT & MEYER 1998, STAUDT 2013). Distribution: European, Subatlantic.

Asphondylia scrophulariae (SCHINER, 1856)

Orange coloured larvae cause flower bud galls on *Scrophularia canina* L. (Scrophulariaceae). Occurrence: intermediate (ENGEL & WEIDNER 1952). Distribution: Mediterranean.

Asphondylia serpylli KIEFFER, 1898

Asphondylia thymi KIEFFER, 1898

Reddish larvae cause flower bud galls on *Thymus serpyllum* L. (Lamiaceae). Occurrence: rare (ROSS 1922c, BUHR 1960). Distribution: European.

Asphondylia verbasci (VALLOT, 1827)

Orange coloured larvae cause flower bud galls on *Verbascum lychnitis* L. and *V. nigrum* L. (Scrophulariaceae). Occurrence: frequent (BEUTHIN 1887, HIERONYMUS 1890, KRÖBER 1910, JAAP 1924-1925, SCHLEICHER 1935, LANGE 1936, BUHR 1966, UTECH 1988a, 1988b). Distribution: Submediterranean.

Atrichosema aceris KIEFFER, 1904

White larvae cause spindle-shaped swelling on the petiole or the main vein of *Acer campestre* L. (Aceraceae). Occurrence: very frequent (ROSS 1916, JAAP 1923, 1924-1925, 1928, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, BUHR 1966, OSCHMANN 2000). Distribution: European.

Bayeriola buhri (MÖHN, 1958)

Larvae cause galls on terminal and axillary buds of *Gypsophila fastigiata* L. (Caryophyllaceae). Type locality: Kyffhäuser, Ochsenburg (Thuringia). Occurrence: rare (ROSS 1922c, MÖHN 1958, BUHR 1960, HUBER 1969b, SCHRÖPPEL 1982). Distribution: European.

Bayeriola erysimi (RÜBSAAMEN, 1914)

Larvae cause stem swellings on *Erysimum cheiranthoides* L. (Brassicaceae). Only one generation develop per year. Occurrence: intermediate (RÜBSAAMEN 1914, ROSS 1922c, LUDWIG 1974, BUHR H.J. 2013). Distribution: European.

Bayeriola salicariae (KIEFFER, 1888)

Orange coloured larvae induce leaf or flower bud galls on *Lythrum salicaria* L. (Lythraceae). Occurrence: frequent (KIEFFER 1888a, BUHR 1929, MÖHN 1955a). Distribution: European.

Bayeriola thymicola (KIEFFER, 1888)

Red larvae produce terminal or axillary rosette galls on *Thymus serpyllum* L. and *T. pulegioides* L. (Lamiaceae). Type locality: Ohrdruf (Thuringia). Occurrence: frequent (KIEFFER 1888a, ROSS 1922c, JAAP 1919-1920, SCHLEICHER 1935, BUHR 1929, 1966, HUBER 1969b, SCHRÖPPEL 1984, OSCHMANN 2000). Distribution: European, North African.

Blastodiplosis artemisiae (KIEFFER, 1901)

Yellow larvae develop in swollen flower heads of *Artemisia vulgaris* L. (Asteraceae). Occurrence: very rare (BUHR 1929, SCHLEICHER 1935). Distribution: European.

Blastomyia origani (TAVARES, 1902)

Oligotrophus origani TAVARES, 1902

Larvae cause large galls on *Origanum virens* HOFFMANNS & LINK (Lamiaceae). The gall is formed of aggregated leaves. Occurrence: very rare (LANGE 1936, RAPP 1942). Distribution: Mediterranean.

Brachineura maura (RÜBSAAMEN, 1910)

Acroectasis maura RÜBSAAMEN, 1910

Biology unknown. RÜBSAAMEN (1910) caught a male in his room in Remagen (Type locality), which is the single record. Occurrence: rare. Distribution: European.

Brachineura squamigera (WINNERTZ, 1853)

Spaniocera squamigera WINNERTZ, 1853

Type locality: „Germany", probably Krefeld. It is a mycophagous species. WINNERTZ (1853) caught adults in the nature. Later adults were reared from *Paxillus filamentosus* (SCOP.) FR. (Fungi: Paxillaceae) associated with *Alnus* spp. (Betulaceae) and from an unidentified species of the genus *Rhizopogon* (Fungi, Rhizogonaceae) (SKUHRAVÁ 2004, SKUHRAVÁ et al. 2005). Occurrence: rare (WINNERTZ 1853, KRÖBER 1910, MEYER 1984). Distribution: European.

Brachineura stygia (MEIGEN, 1818)

Lasioptera stygia MEIGEN 1818

Biology unknown. Type locality: Germany. Adults were caught in the nature. Occurrence: very rare (MEIGEN 1818). Distribution: European, Germany, England, Latvia.

Brachydiplosis caricum RÜBSAAMEN, 1910

Yellow-red larvae live under the sheaths of withered leaves of *Carex* sp. (Cyperaceae). Type locality: Berlin. Occurrence: very rare (RÜBSAAMEN 1910). Distribution: European.

Bremia cilipes (WINNERTZ, 1853)

Cecidomyia (*Diplosis*) *cilipes* WINNERTZ, 1853

Biology unknown. WINNERTZ (1853) reared adults from the trunk of *Fagus sylvatica* L. (Fagaceae) inhabited by large amount of the fly larvae *Neolimonia dumetorum* (MEIGEN, 1804) (Diptera: Limoniidae). Occurrence: very rare (WINNERTZ 1853). Distribution: European.

Bremia decorata (LOEW, 1850)

Cecidomyia (*Diplosis*) *decorata* LOEW, 1850; *Cecidomyia decorata* WINNERTZ, 1853

LOEW (1850) and WINNERTZ (1853) obtained adults from the decaying wood of *Fagus sylvatica* L. (Fagaceae), inhabited by large amount of various dipteran larvae. Occurrence: rare (WINNERTZ 1853, SKUHRAVÁ in WEBER 1995). Distribution: European.

Bremiola onobrychidis (BREMI, 1847)

White larvae produce pod-like galls on leaflets on *Onobrychis viciifolia* SCOP. ssp. *sativa* LAM. (Fabaceae). Occurrence: frequent (ROSS 1916, HEDICKE 1917-1918, JAAP 1924-1925,

SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, HUBER 1969b, OSCHMANN 2000). Distribution: Eurosiberian, up to Armenia and Kazakhstan. In the past it occurred abundantly, recently in Europe its occurrence decreased. In the Czech Republic it is as regionally extinct (SKUHRAVÁ 2005).

Buhriella rubicola STELTER, 1960

Yellowish larvae cause galls on leaves of *Rubus idaeus* L. (Rosaceae). One generation develops per year. Larvae hibernate in the soil. Type locality: Groß Lüsewitz. Occurrence: intermediate (STELTER 1960, BUHR 1966). Distribution: European.

Buhromyiella giganteosaetosa HOLZ, 1970

Larvae are mycophagous on various species of powdery mildews *Erysiphe* and *Sphaerotheca* (Fungi: Erysiphaceae). Type locality: Mühlhausen (Thuringia). Occurrence: rare (HOLZ 1970). Distribution: European.

Camptodiplosis boleti (KIEFFER, 1901)

Mycodiplosis boleti KIEFFER, 1901; *Mycodiplosis poriae* RÜBSAAMEN, 1912

Larvae are mycophagous. They develop in the fruiting bodies of various species of fungi. KIEFFER (1901) found a single female ovipositing on *Albatrellus confluens* (ALB. & SCHWEIN.) KOTL. & POUZAR (Fungi: Albatrellaceae). RÜBSAAMEN, 1912 recorded it from *Fibroporia vaillantii* (DC.) PARMASTO (Fungi: Polyporaceae). HOLZ (1970) reared this species from *Albatrellus cristatus* (SCHAEFF.) KOTL. & POUZ. and *Albatrellus ovinus* (SCHAEFF.) KOTL. & POUZ, respectively from *Grifola frondosa* (DICKS.) GRAY (Fungi: Albatrellaceae & Meripilaceae). Occurrence: rare (RÜBSAAMEN 1912, HOLZ 1970). Distribution: European.

Cecidomyia magna (MÖHN, 1955)

Stelechodiplosis magna MÖHN, 1955

Larvae live in old resin mass of *Picea abies* (L.) KARSTEN (Pinaceae) where they also hibernate. Type locality: Hebertshausen near Munich. Occurrence: rare (MÖHN 1955a , 1955b). Distribution: European.

Cecidomyia pini (DE GEER, 1776)

Larvae are associated with resin masses on branches of *Pinus sylvestris* L. and *Picea abies* (L.) KARSTEN (Pinaceae). Larvae form white cocoons out on needles. Two generations develop per year. Occurrence: intermediate (BEUTHIN 1887, KRÖBER 1910, TUBEUF 1930a, 1930b, MÖHN 1955a). Distribution: European.

Clinodiplosis botularia (WINNERTZ, 1853)

Pink larvae live as inquilines in galls of the gall midge *Dasineura fraxini* (KIEFFER) on leaves of *Fraxinus excelsior* L. (Oleaceae). Occurrence: intermediate (WINNERTZ 1853). Distribution: European.

Clinodiplosis cilicrus (KIEFFER, 1889)

Clinodiplosis strobi KIEFFER, 1909; *Clinodiplosis rosiperda* RÜBSAAMEN, 1892; *Clinodiplosis vitis* LÜSTNER, 1900; *Clinodiplosis acinorum* RÜBSAAMEN, 1906; *Clinodiplosis schlechtendaliana* RÜBSAAMEN, 1911; *Clinodiplosis gallicola* RÜBSAAMEN, 1911; *Clinodiplosis rhynchitou* RÜBSAAMEN, 1911; *Clinodiplosis lathyri* RÜBSAAMEN, 1917; *Clinodiplosis scorzonerae* RÜBSAAMEN, 1917; *Clinodiplosis piceae* KIEFFER, 1920

Pink larvae are phytosaprophagous and live mainly in flower heads of various plant species of the family Asteraceae, in galls caused by other gall midges, in decaying plant matter and in cones of coniferous trees. Two generations develop per year. Many species of the genus *Clinodiplosis* KIEFFER, 1894 were described. SKUHRAVÁ (1973) synonymized 34 species under *Clinodiplosis cilicrus*. Occurrence: very frequent (RÜBSAAMEN, 1890a, 1892b, 1906, 1911, 1917, KIEFFER 1920, LUDWIG 1935, SCHLEICHER 1935, NOLTE 1954a, MÖHN 1955a, MEYER 1984, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, SKUHRAVÁ in WEBER 1995, WERNER 1997). Distribution: Eurosiberian.

Clinodiplosis cingulata (WINNERTZ, 1853)
Biology unknown. Adults were caught. Occurrence: very rare (WINNERTZ 1853). Distribution: European.
Clinodiplosis invocata (WINNERTZ, 1853)
Yellowish larvae develop as inquilines in galls caused by the the gall midge *Dasineura acrophila* WINNERTZ on leaflets of *Fraxinus excelsior* L. (Oleaceae). Occurrence: rare (WINNERTZ 1853). Distribution: European.
Clinodiplosis latibulorum (WINNERTZ, 1853)
Biology unknown. Adults were caught. Occurrence: very rare (WINNERTZ 1853). Distribution: European.
Clinodiplosis mutabilis (WINNERTZ, 1853)
Biology unknown. Adults were caught. Occurrence: very rare (WINNERTZ 1853). Distribution: European.
Clinodiplosis oleracei RÜBSAAMEN, 1917
Whitish-yellow larvae live on the upper side of the leaves of *Cirsium oleraceum* (L.) SCOP. (Asteraceae). Attacked leaves are twisted and yellow coloured. Type locality: Triglitz/Prignitz. Occurrence: intermediate (HEDICKE 1917-1918, JAAP 1918, LANGE 1936, BRAUN 1983). Distribution: European.
Clinodiplosis socialis (WINNERTZ, 1853)
Larvae live as inquilines in galls of the gall midge *Lasioptera rubi* (SCHRANK) on *Rubus* spp. Occurrence: very rare (WINNERTZ 1853). Distribution: European.
Coniophora autumnalis (MAMAEV, 1961)
Procystiphora autumnalis MAMAEV, 1961
MAMAEV (1961) caught adults in the nature. NIJVELDT (1973) reared adults from flower buds of *Ulmus minor* MILL. (Ulmaceae). Occurrence: very rare (GÄBLER 1958). Distribution: European.
Contarinia acerplicans (KIEFFER, 1889)
White larvae cause leaf-fold galls on *Acer pseudoplatanus* L. and *A. campestre* L. (Aceraceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: frequent (KIEFFER 1889, RÜBSAAMEN 1889a, HIERONYMUS 1890, ROSS 1916, 1922c, JAAP 1919-1920, 1924-1925, BUHR 1939, LUDWIG 1935, SCHLEICHER 1935, NIESSEN 1938, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1992b, OSCHMANN 2000, STAUDT 2013). Distribution: European.
Contarinia acetosellae (RÜBSAAMEN, 1891)
Larvae develop in deformed flower buds of *Rumex acetosella* L. (Polygonaceae). Type locality: Siegen. Occurrence: intermediate (RÜBSAAMEN 1891c, 1912, HEDICKE 1917-1918, JAAP 1918, MÖHN 1955a). Distribution: European; introduced to North America (GAGNÉ 1989).
Contarinia aconitifloris STELTER, 1962
Larvae develop in swollen flower buds of *Aconitum lycoctonum* L. and *A. napellus* L. (Ranunculaceae). Type locality: Mühlhausen (Thuringia). Occurrence: rare (ROSS 1922c, JAAP 1919-1920, HUBER 1969b, STELTER 1962a, SCHRÖPPEL 1980). Distribution: Euro-Siberian.
Contarinia acrocecis STELTER, 1962
Red larvae cause artichoke galls on stem tops of *Galium mollugo* L. (Rubiaceae). Type locality: Groß Lüsewitz. Occurrence: rare (STELTER 1962b). Distribution: European
Contarinia aequalis KIEFFER, 1898
Yellow larvae cause galls on leaf buds of *Senecio nemorensis* L. ssp. *fuchsii* (GMEL.) CELAK. (Asteraceae). Occurrence: frequent (ROSS 1916, HEDICKE 1917-1918, JAAP 1919-1920, 1923,

LUDWIG 1935, NIESSEN 1937, HUBER 1969b, SCHRÖPPEL 1984, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000). Distribution: Eurosiberian.

Contarinia anthobia (F. LÖW, 1877)

Yellow larvae live in swollen flower buds of *Crataegus laevigata* (POIRET) DC. (Rosaceae). Occurrence: frequent (RÜBSAAMEN 1890a, HEDICKE 1917-1918, JAAP 1918, 1928, LUDWIG 1935, SCHLEICHER 1935). Distribution: European.

Contarinia anthonoma (KIEFFER, 1890)

White jumping larvae develop in deformed flower buds of *Cytisus scoparius* (L.) LINK (Fabaceae). Only one generation develop per year. Larvae hibernate in the soil. Occurrence: rare (ROSS 1922c, ZELLER 1942). Distribution: European.

Contarinia anthophthora (F. LÖW, 1880)

Whitish larvae live in deformed flower buds of *Verbascum orientale* (L.) ALL. (Scrophulariaceae). Occurrence: intermediate. References: LÖW 1880, HEDICKE 1917-1918, JAAP 1918, SCHLEICHER 1935, BUHR H.J. 2013. Distribution: European.

Contarinia artemisiae RÜBSAAMEN, 1917

Larvae live in slightly swollen flower buds of *Artemisia vulgaris* L. (Asteraceae). Occurrence: intermediate (JAAP 1918, BUHR 1939, PICHINOT & MEYER 1998). Distribution: European.

Contarinia asclepiadis (GIRAUD, 1863)

Whitish larvae live in deformed fruit capsules of *Vincetoxicum hirundinaria* MEDIK. (Asclepiadaceae). Occurrence: rare (JAAP 1924-1925, BUHR 1966, OSCHMANN 2000). Distribution: European.

Contarinia baeri (PRELL, 1931)

Yellow larvae live free between a pair of needles of *Pinus sylvestris* L. (Pinaceae). Type locality: Tharandter Wald near Dresden. Damaged needles of full length are sharply bent at the base and hanging down obliquely. One generation develops per year. Larvae hibernate in the soil. This species is a minor pest in Europe (SKUHRAVÁ & ROQUES 2000). Occurrence: frequent (BUTOWITSCH 1930, PRELL 1931, BERGER 1957, POSTNER 1982, FRIEDERICHS & WINTER 1987, SKUHRAVÁ & SKUHRAVÝ 1992a). Distribution: Eurosiberian.

Contarinia baggendorfi STELTER 1982

Larvae cause flower bud galls on *Angelica sylvestris* L. (Apiaceae). Type locality: Baggendorf (Grimmen). Occurrence: very rare (STELTER 1982b). Distribution: European.

Contarinia ballotae KIEFFER, 1898

White larvae develop in swollen leaf bud galls of *Ballota nigra* L. (Lamiaceae). Occurrence: frequent (V. SCHLECHTENDAL 1883, JAAP 1918, 1923, 1924-1925, LANGE 1936). Distribution: European.

Contarinia barbichei (KIEFFER, 1890)

White larvae develop in leaf bud galls on *Lotus corniculatus* L. (Fabaceae). Two up to four generations may develop per year. Pupation occurs in the soil. Occurrence: frequent (ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1919-1920,1924-1925, BUHR 1929, 1939,1966, MARESQUELLE 1931, SCHLEICHER 1935, BERGER 1936, STELTER 1954, HUBER 1969b, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1992a, OSCHMANN 2000). Distribution: European.

Contarinia campanulae (KIEFFER, 1895)

White larvae live in deformed flower buds of *Campanula rapunculoides* L. and *C. trachelium* L. (Campanulaceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: frequent (TOEPFER 1918, ROSS 1916, 1922c, JAAP 1919-1920, 1924-1925, SCHLEICHER 1935, LANGE 1936, HUBER 1969b, SCHRÖPPEL 1981, OSCHMANN 2000). Distribution: European.

Contarinia carpini KIEFFER, 1897

White larvae produce leaf galls on *Carpinus betulus* L. (Corylaceae). One generation develop per year. Hibernation in the soil. Occurrence: frequent (RÜBSAAMEN 1891c, ROSS 1916, 1922c, JAAP 1918, SCHLEICHER 1935, BUHR 1966, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.

Contarinia chrysanthemi (KIEFFER, 1895)

Yellow larvae live among achenes in flowerheads *Leucanthemum vulgare* LAM. (Asteraceae). Occurrence: very rare (BUHR 1964 #1790 mentioned that galls are known from Germany without referring to a locality). Distribution: European.

Contarinia convallariae RÜBSAAMEN, 1925

Gregarious larvae develop in swollen flower buds of *Convallaria majalis* L. (Liliaceae). There is no description of this species, only a figure in RÜBSAAMEN & HEDICKE (1925-1939, p. 47). THOMAS (1909) found swollen flower buds of *Convallaria majalis* in his garden in Ohrdruf in Mai 1907 and sent the microscope slide with larvae to Rübsaamen for identification. Occurrence: very rare (THOMAS 1909, ROSS 1911, HOUARD 1913, RÜBSAAMEN & HEDICKE 1925-1939). Distribution: European.

Contarinia coryli (KALTENBACH, 1859)

Diplosis corylina F. LÖW, 1878

White larvae, usually three or four in number, live in catkins of *Corylus avellana* L. (Corylaceae) and cause swellings. One generation develops per year. Larvae hibernate in the soil. Occurrence: very frequent (HIERONYMUS 1890, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1918, 1923, BUHR 1929, 1966, BENICK 1932, LUDWIG 1935, SCHLEICHER 1935, WEIDNER 1950, WEIDNER & WEIDNER 1951, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988, BUHR H.J. 2005, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian, up to China.

Contarinia craccae (LOEW, 1850)

Contarinia craccae KIEFFER, 1897

Yellowish orange larvae develop in swollen flower buds of *Vicia cracca* L. (Fabaceae). Two generations develop per year. Larvae hibernate in the soil. Occurrence: frequent (ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1924-1925, ZELLER 1941, STELTER 1958, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1992b, PICHINOT & MEYER 1998, OSCHMANN 2000, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Contarinia crispans KIEFFER, 1909

White larvae live among frilled and twisted leaves of *Valeriana officinalis* L. (Valerianaceae). Occurrence: very rare (V. SCHLECHTENDAL 1891, ROSS 1911, JAAP 1918). Distribution: European.

Contarinia dactylidis (LOEW, 1851)

Larvae live in inflorescences of *Dactylis glomerata* L. (Poaceae). Occurrence: very rare (PICHINOT & MEYER 1998). Distribution: European.

Contarinia digitata (LOEW, 1850)

Cecidomyia digitata WINNERTZ, 1853

Biology unknown. WINNERTZ (1853) caught adults on poor meadows („auf schlechten Wiesen") which is the single record. Occurrence: very rare (WINNERTZ 1853). Distribution: European.

Contarinia dipsacearum RÜBSAAMEN, 1921

Larvae develop in deformed flowerheads of *Knautia arvensis* (L.) COULT. and *Succisa pratensis* MOENCH (Dipsacaceae). Type locality: Eibsee near Oberstdorf (Allgäu). Occurrence: frequent (ROSS 1922c, JAAP 1918, 1919-1920, RÜBSAAMEN 1921, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, BROMM 1964, HUBER 1969b, SCHRÖPPEL 1982). Distribution: European.

Contarinia echii (KIEFFER, 1895)

Larvae live in swollen flower buds of *Echium vulgare* L. (Boraginaceae). Occurrence: very rare (ROSS 1916). Distribution: European.

Contarinia fagi RÜBSAAMEN, 1921

Whitish yellow larvae live among young deformed leaves of *Fagus sylvatica* L. (Fagaceae). Type locality: Partenkirchen. Larvae feed on very young leaves that are just expanding. Attacked leaves are heavily damaged; the shoot either does not develop or turns black and falls. Multiplication of lateral shoots is a result of the attack. Several generations develop per year. Pupation takes place in the soil. It is evaluated as a minor pest that may cause serious harm in nurseries (SKUHRAVÁ & ROQUES 2000). Occurrence: very frequent (ROSS 1922c, RÜBSAAMEN 1921, JAAP 1919-1920, 1924-1925, 1928, BUHR 1939, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, BROMM 1964, HUBER 1969b, SCHRÖPPEL 1981, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000, HOLIGHAUS & LUNDERSTÄDT 2009). Distribution: European.

Contarinia festucae JONES, 1940

Larvae live in inflorescences of *Festuca rubra* L. (Poaceae). Occurrence: rare (MEYER 1984: reared from *Festuca arundinacea* SCHREB). Distribution: European.

Contarinia floricola (V. OETTINGEN, 1927)

Contarinia poae BARNES, 1946; SKUHRAVÁ 1986, 1989; *Contarinia poae* TOMASZEWSKI, 1931: auctorum; synonymy according to GAGNÉ (2004).

Several yellow larvae live in inflorescences of *Poa pratensis* L. (Poaceae). Only one generation develops per year. This species was first discovered at Szczecin (Poland) (V. OETTINGEN 1927). TOMASZEWSKI (1931) collected this species at Randowbruch (Western-Pomerania). Occurrence: frequent (SCHOBER 1959, MÜHLE 1957, FRÖHLICH 1958a, MEYER 1984). Distribution: European.

Contarinia floriperda RÜBSAAMEN, 1917

Several larvae live in swollen flower buds of *Sorbus aucuparia* L. (Rosaceae). One generation develops per year. Type locality: Triglitz/Prignitz. Occurrence: intermediate (RÜBSAAMEN 1917, JAAP 1918, 1928, SCHLEICHER 1935, BUHR 1939). Distribution: European.

Contarinia florum RÜBSAAMEN, 1917

White larvae live in swollen flower buds of *Asparagus officinalis* L., *Convallaria majalis* L. and *Polygonatum multiflorum* (L.) ALL. (Liliaceae). Occurrence: very rare (RÜBSAAMEN, 1917, JAAP 1928). Distribution: European.

Contarinia galeobdolontis KIEFFER, 1909

Whitish larvae live among small leaves of the terminal pair on *Lamium galeobdolon* (L.) NATH. (Lamiaceae). Occurrence: intermediate (NIESSEN 1937, BUHR 1966, HUBER 1969b). Distribution: European.

Contarinia gei KIEFFER, 1909

Contarinia geicola RÜBSAAMEN, 1917

White larvae live in deformed leaves of *Geum urbanum* L. (Rosaceae). Occurrence: frequent (ROSS 1922c, RÜBSAAMEN 1917, HEDICKE 1917-1918, JAAP 1918, 1924-1925, 1928, BUHR 1929, 1966, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, STELTER 1954). Distribution: Eurosiberian.

Contarinia heraclei (RÜBSAAMEN, 1889)

White larvae live in small depressions on the lower side of the leaves of *Heracleum sphondylium* L. (Apiaceae). Type locality: Berlin. Occurrence: intermediate (RÜBSAAMEN 1889c, JAAP 1919-1920, ROSS 1922c, LUDWIG 1935, SCHLEICHER 1935, HUBER 1969b, SCHRÖPPEL 1982). Distribution: European.

Contarinia hyperici BARNES, 1952

Larvae live in swollen flower buds of *Hypericum perforatum* L. (Hypericaceae). Occurrence: intermediate (HAASE & UTECH 1971). Distribution: European.

Contarinia hypochoeridis (RÜBSAAMEN, 1891)

Larvae develop in flower heads of *Hypochoeris radicata* L. and *H. glabra* L. (Asteraceae). Occurrence: frequent (RÜBSAAMEN 1890a, 1891c, 1891e, 1912, LUDWIG 1935, BUHR 1939, MÖHN 1955a, MEYER 1984, PICHINOT & MEYER 1998). Distribution: European.

Contarinia inquilina RÜBSAAMEN, 1917

Orange-yellow larvae live as inquilines in fruit galls caused by the the gall midge *Kiefferia pericarpiicola* (BREMI) on *Pimpinella saxifraga* L. (Apiaceae). Occurrence: very rare (RÜBSAAMEN 1917, JAAP 1918). Distribution: European.

Contarinia inulicola STELTER, 1965

White larvae live in leaf bud galls at the stem top of *Inula britannica* L. (Asteraceae). Type locality: Bad Sülze (Western Pomerania). Occurrence: rare (STELTER & BUHR 1965, BUHR H.J. 2013). Distribution: European.

Contarinia jaapi RÜBSAAMEN, 1914

Yellow-white larvae live in terminal leaf galls on *Lathyrus pratensis* L. (Fabaceae). Type locality: Triglitz/Prignitz. Occurrence: intermediate (JAAP 1918, 1928, SCHLEICHER 1935, BUHR 1939). Distribution: European.

Contarinia jacobaeae (LOEW, 1850)

Larvae develop in flower heads or in deformed stems of *Senecio jacobaea* L. (Asteraceae). Two or more generations develop per year. Larvae pupate in the soil. Occurrence: very frequent (RÜBSAAMEN 1891b, 1891e, HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, NIESSEN 1938, BERGER 1936, HUBER 1969b, STAUDT 2013). Distribution: Eurosiberian.

Contarinia kiefferi (V. SCHLECHTENDAL, 1891)

Yellow larvae cause oval, reddish, fleshy galls on terminal or side buds on stem of *Descurainia sophia* (L.) WEBB (Brassicaceae). The gall includes also pertinent flower buds. Type locality: Zwickau. Occurrence: very rare. Schlechtendal's record has been the single one in Germany (V. SCHLECHTENDAL 1891, ROSS 1911). Distribution: European.

Contarinia lamii KIEFFER, 1909

Larvae live between deformed leaves of *Lamium maculatum* L. (Lamiaceae). Occurrence: very rare (SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.

Contarinia lamiicola RÜBSAAMEN, 1916

White larvae live in terminal leaf bud gall of *Lamium maculatum* L. (Lamiaceae). Occurrence: frequent (JAAP 1918, 1924-1925, LANGE 1936, HUBER 1969b). Distribution: European.

Contarinia lathyri KIEFFER, 1909

White or yellow larvae live in swollen flower buds of *Lathyrus pratensis* L. (Fabaceae). Occurrence: rare (HUBER 1969b, OSCHMANN 2000). Distribution: Eurosiberian.

Contarinia lilii KIEFFER, 1909

Yellow larvae develop in swollen flower buds of *Lilium martagon* L. (Liliaceae). Occurrence: frequent (ROSS 1922c, RODE 1965, PICHINOT & MEYER 1998, OSCHMANN 2000). Distribution: European.

Contarinia lonicerearum (F. LÖW, 1877)

Larvae cause flower bud galls on *Lonicera xylosteum* L. and other *Lonicera*-species (Caprifoliaceae). Occurrence: very frequent (RÜBSAAMEN 1890a, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1924-1925, BUHR 1930, 1939, LUDWIG 1935, HUBER 1969b, BUHR H.J. 2013). Distribution: European.

Contarinia loti (DE GEER, 1776)

Yellow larvae live in flower buds of *Lotus corniculatus* L. (Fabaceae). Attacked buds are swollen and remain shut. Two or more generations develop per year. Larvae pupate in the soil. Occurrence: extremely frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, ROSS 1916, 1922c, JAAP 1918, 1923, 1924-1925, 1928, BUHR 1929, MARESQUELLE 1931, SCHLEICHER 1935, LUDWIG 1935, LANGE 1936, WEIDNER & WEIDNER 1951, MÖHN 1955a, STELTER 1958, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1982, UTECH 1988a, 1988b, OSCHMANN 2000, LEHMANN 2007, LEHMANN & FLÜGEL 2012). Distribution: European.

Contarinia lysimachiae (RÜBSAAMEN, 1893)

Yellowish white larvae live in swollen flower buds of *Lysimachia vulgaris* L. (Primulaceae). Occurrence: intermediate (RÜBSAAMEN 1891b, HEDICKE 1917-1918, SCHLEICHER 1935, SKUHRAVÁ & SKUHRAVÝ 1992a). Distribution: European.

Contarinia majanthemi RÜBSAAMEN, 1925

White larvae develop in swollen flower buds of *Majanthemum bifolium* (L.) SCHM. (Liliaceae). Only the larvae are described (RÜBSAAMEN in RÜBSAAMEN & HEDICKE, 1925-1939) with spatula and terminal segment. Occurrence: very rare (JAAP 1918 as Cecidomyidarum sp.). Distribution: European.

Contarinia marchali KIEFFER, 1896

Larvae develop inside swollen fruits of *Fraxinus excelsior* L. (Oleaceae). Only one generation develops per year. Hibernation and pupation take place in the soil. Occurrence: intermediate (BUHR 1966, HUBER 1969b). Distribution: European.

Contarinia martagonis KIEFFER, 1909

Yellow larvae live inside swollen deformed flower buds of *Lilium martagon* L. (Liliaceae) which are covered with long white hairs. Occurrence: rare (RODE 1965, HUBER 1974). Distribution: European.

Contarinia medicaginis KIEFFER, 1895

Yellow larvae induce galls on flower buds of *Medicago sativa* L. and *M. falcata* L. (Fabaceae). Two or more generations develop per year. Larvae pupate in the soil. In central, southern and southeastern Europe it is a serious pest of lucerne (DARVAS et al. 2000). Occurrence: very frequent (ROSS 1916, HEDICKE 1917a, JAAP 1923, 1924-1925, BUHR 1929, 1966, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, MÖHN 1955a, KLEMM 1957, HUBER 1969b, UTECH 1988a, 1988b, OSCHMANN 2000, LEHMANN 2007, KWAST 2012). Distribution: Eurosiberian (Holarctic).

Contarinia melanocera KIEFFER, 1904

Larvae produce plurilocular swellings on the twigs of *Genista tinctoria* L. (Fabaceae). Only one generation develops per year. Larvae hibernate in the soil. Occurrence: frequent (ROSS 1916, JAAP 1918, BUHR 1929, 1966, SCHLEICHER 1935, BERGER 1936, BROMM 1964). Distribution: European.

Contarinia merceri BARNES, 1930

Larvae live gregariously in the inflorescences of *Alopecurus pratensis* L. (Poaceae). Damaged florets are later blind or empty. Larvae feed on the reproductive organs and prevent seed production. Usually only one generation develops per year. Occurrence: rare (FRÖHLICH 1960, GREILER 1994). Distribution: Eurosiberian.

Contarinia molluginis (RÜBSAAMEN, 1889)

Several dirty yellowish-white larvae develop in leaf bud galls on *Galium mollugo* L. (Rubiaceae). Occurrence: frequent (RÜBSAAMEN 1889a, ROSS 1922c, HEDICKE 1917-1918, JAAP 1918, BUHR 1929, LUDWIG 1935, STELTER 1962b, HUBER 1969b). Distribution: Eurosiberian.

Contarinia nasturtii (KIEFFER, 1888)

Diplosis nasturtii KIEFFER, 1888; *Diplosis ruderalis* KIEFFER, 1890; *Contarinia torquens* DE MEIJERE, 1906; *Contarinia isatidis* RÜBSAAMEN, 1910; *Contarinia perniciosa* RÜBSAAMEN, 1914; *Contarinia geisenheyneri* RÜBSAAMEN, 1917

KIEFFER (1888b) described this species from swollen flower buds of *Rorippa palustris* (L.) BESSER (Brassicaceae). Later several other species were described from various host plants of Brassicaceae. STOKES (1953) proved by biological investigations and experiments that some species are identical with *C. nasturtii*. Lemon-yellow larvae cause several types of damage: they live in swollen flower buds that remain closed, in crincled and crumpled heart leaves and in swollen young shoots. Several generations develop per year. Pupation takes place in the soil. It is a pest of cabbage (DARVAS et al. 2000). Occurrence: extremely frequent up to 1970, the occurrence decreased after 1970 (RÜBSAAMEN 1912, GEISENHEYNER 1907, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1929, 1939, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, NIESSEN 1937, ZELLER 1940, WEIDNER & WEIDNER 1951, MEYER 1954, NOLTE & FRITSCHE 1954, STELTER 1954, KRÖBER 1956, NOLL 1959a, 1959b, BUHR 1960, 1966, HAASE & UTECH 1971, ESCHELMÜLLER 1972, KLEMENT & ESCHELMÜLLER 1978). Distribution: European, including Turkey; immigrant in Canada.

Contarinia nicolayi (RÜBSAAMEN, 1895)

Larvae live in swollen flower buds of *Heracleum sphondylium* L. (Apiaceae). Occurrence: very frequent (ROSS 1916, 1922c, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, HUBER 1969b, STELTER 1982b OSCHMANN 2000). Distribution: European.

Contarinia onobrychidis KIEFFER, 1895

Yellow larvae develop in swollen flower buds of *Onobrychis viciifolia* SCOP. (Fabaceae). Occurrence: rare (ROSS 1916, 1922c, JAAP 1924-1925, WEIDNER & WEIDNER 1951, OSCHMANN 2000). Distribution: Eurosiberian.

Contarinia ononidis KIEFFER, 1899

Yellow larvae develop in deformed vegetative tips of *Ononis repens* L. (Fabaceae). Occurrence: frequent (BUHR H.J. 2013, LANGE 1936, PICHINOT & MEYER 1998). Distribution: European.

Contarinia pastinaceae (RÜBSAAMEN, 1891)

Yellow larvae develop in slightly swollen fruits of *Pastinaca sativa* L. (Apiaceae). Type locality: Berlin. Occurrence: frequent (HEDICKE 1917-1918, RÜBSAAMEN 1891b, NIESSEN 1938, WEIDNER & WEIDNER 1951, WEIDNER 1962). Distribution: European.

Contarinia petioli (KIEFFER, 1898)

Harmandia petioli KIEFFER, 1898; *Syndiplosis winnertzi* RÜBSAAMEN, 1910

Orange coloured larvae cause globular galls on leaf petioles on *Populus tremula* L. (Salicaceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: extremely frequent (HIERONYMUS 1890, RÜBSAAMEN 1910, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1924-1925, 1928, BUHR 1929, 1966, BENICK 1932, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, WEIDNER & WEIDNER 1951, WEIDNER 1950, 1962, MÖHN 1955a, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1988, PICHINOT & MEYER 1998, OSCHMANN 2000, BUHR H.J. 2005, STAUDT 2013). Distribution: Eurosiberian.

Contarinia picridis (KIEFFER, 1912)

Larvae develop in galls formed by haired leaves of *Picris hieracioides* L. (Asteracae). Occurrence: frequent (JAAP 1923, 1924-1925, WEIDNER & WEIDNER 1951, OSCHMANN 2000). Distribution: European.

Contarinia pilosellae KIEFFER, 1896

Lemon yellow larvae live in swollen flower heads of *Hieracium pilosella* L. (Asteraceae). Occurrence: very frequent (RÜBSAAMEN 1890a, ROSS 1922c, JAAP 1918, 1919-1920, 1924-1925, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, STELTER 1954, MÖHN 1955a, BUHR 1966, OSCHMANN 2000). Distribution: European.

Contarinia pisi (LOEW, 1850)

Cecidomyia pisi WINNERTZ, 1854

White larvae live in swollen flower buds, clustered leaves at vegetative tips or in malformed pods of *Pisum sativum* L. (Fabaceae). Several generations develop per year. Larvae pupate in the soil. *C. pisi* is locally a major pest, mainly in areas where peas have been grown intensively (DARVAS et al. 2000). Occurrence: frequent (WINNERTZ 1853, BEUTHIN 1887, SACK 1907, KRÖBER 1910, SCHLEICHER 1935, BUHR 1939, 1966). Distribution: Eurosiberian.

Contarinia polygonati RÜBSAAMEN, 1921

Whitish larvae live in swollen flower buds of *Polygonatum multiflorum* (L.) ALL. (Liliaceae). Type locality: Triglitz/Prignitz. Occurrence: rare (ROSS 1922c, JAAP 1918, RÜBSAAMEN 1921). Distribution: European.

Contarinia populi (RÜBSAAMEN, 1917)

Yellow-whitish larvae cause small globular galls on the leaves of *Populus tremula* L. (Salicaceae). Each gall projects on both sides of the leaf and has a small circular opening on the upper or on the lower side. One generation develops per year. Hibernation takes place in the soil. Occurrence: frequent (RÜBSAAMEN 1890a, JAAP 1918, 1919-1920, 1924-1925, LUDWIG 1935, SCHLEICHER 1935, BUHR 1966, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, KWAST 2012). Distribution: Eurosiberian.

Contarinia pulchripes (KIEFFER, 1890)

White larvae develop in deformed pods of *Cytisus scoparius* (L.) LINK and *Genista pilosa* L. (Fabaceae). Occurrence: intermediate (SACK 1907, SCHLEICHER 1935). Distribution: European.

Contarinia pyrivora (RILEY, 1886)

Many yellowish-white larvae live inside the malformed and enlarged unripe fruits of *Pyrus communis* L. (Rosaceae). The infested fruits dry up and crack, later falling to the ground. Before then the fully-grown larvae leave attacked fruits and fall to the soil where they hibernate. One generation develops per year. It is a major pest of pear (DARVAS et al. 2000). Occurrence: very frequent (SACK 1907, HEDICKE 1917-1918, JAAP 1918, SCHLEICHER 1935, BUHR 1939, 1966). Distribution: Eurosiberian (Holarctic).

Contarinia quercina (RÜBSAAMEN, 1890)

Yellow-white larvae live among very young leaves in leaf buds of *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). Attack results in irregular rosette of deformed leaves. Two generations develop per year. Hibernation in the soil. *C. quercina* is a pest of young oak trees in forest nurseries (SKUHRAVÁ & ROQUES 2000). Occurrence: frequent (RÜBSAAMEN 1890a, ROSS 1922c, JAAP 1918, 1919-1920, 1923, 1928, BUHR 1929, LUDWIG 1935, SCHLEICHER 1935, PFÜTZENREITER & WEIDNER 1958, SKUHRAVÁ & SKUHRAVÝ 1988, PICHINOT & MEYER 1998). Distribution: European.

Contarinia quinquenotata (F. LÖW, 1888)

Dirty orange-yellow larvae live in swollen, deformed and unopened flower buds of *Hemerocallis fulva* L. (Liliaceae). One generation develops per year. Larvae hibernate in the soil. It is an alien species in Europe (SKUHRAVÁ et al. 2010). Occurrence: frequent (WEIDNER 1952, KRÖBER 1956, BUHR H.J. 2013). Distribution: European.

Contarinia ramicola (RUDOW, 1875)

Larvae cause plurilocular swellings on young shoots of *Tilia platyphyllos* SCOP. and *T. cordata* MILL. (Tiliaceae). RUDOW (1875a, b) found galls in the castle gardens of Remplin and Ivenack (Mecklenburg). Occurrence: very rare (RUDOW 1875b). Distribution: European.

Contarinia rhamni RÜBSAAMEN, 1892

Larvae live in swollen flower buds of *Rhamnus frangula* L. (Rhamnaceae). Type locality: Siegen. Occurrence: intermediate (RÜBSAAMEN 1892b, HEDICKE 1917-1918, BUHR 1930, LUDWIG 1935, SCHLEICHER 1935). Distribution: European.

Contarinia ribis KIEFFER, 1909

Larvae live in unopened flower buds of *Ribes uva-crispa* L. (Grossulariaceae). Occurrence: intermediate (V. SCHLECHTENDAL 1891, ROSS 1916, JAAP 1924-1925). Distribution: European.

Contarinia rubicola KIEFFER, 1909

Contarinia rubicola RÜBSAAMEN, 1910

White larvae live in unopened flower buds of *Rubus caesius* L. (Rosaceae). Occurrence: frequent (RÜBSAAMEN 1910, MÖHN 1955a). Distribution: European.

Contarinia rumicis (LOEW, 1850)

After LOEW (1850) larvae develop in swollen flower buds of various species of *Rumex*, mainly *R. acetosa* L. and *R. acetosella* L. (Polygonaceae), after HARRIS (2003) in fruit galls. Occurrence: very rare (BUHR 1939). Distribution: Eurosiberian, immigrant in USA.

Contarinia sambuci (KALTENBACH, 1873)

KALTENBACH (1873) described the species based on red-yellow larvae that cause galls on flower buds of *Sambucus nigra* L. (Caprifoliaceae). One generation per year. Hibernation in the soil. Occurrence: very frequent (KALTENBACH 1874, HIERONYMUS 1890). Distribution: European.

Contarinia scabiosae KIEFFER, 1898

Larvae live in unopened flower buds of *Scabiosa columbaria* L. (Dipsacaceae). Occurrence: very rare (JAAP 1919-1920, ROSS 1922c). Distribution: European.

Contarinia schlechtendaliana (RÜBSAAMEN, 1893)

Contarinia sonchi KIEFFER, 1896

Yellow larvae live in swollen flower heads of *Sonchus arvensis* L. (Asteraceae). Type locality: Sinzig. Occurrence: intermediate (RÜBSAAMEN 1893, LANGE 1936, NIESSEN 1937). Distribution: European.

Contarinia scoparii (RÜBSAAMEN, 1889)

Larvae develop in a chamber of swollen terminal bud of *Cytisus scoparius* (L.) LINK (Fabaceae). Galls occur also on stem, vein, leaf and flower stalks. Type locality: Siegen. Occurrence: very rare (RÜBSAAMEN 1889a, 1889c, LUDWIG 1935). Distribution: European (Atlantic).

Contarinia scrophulariae KIEFFER, 1896

Yellow larvae develop in swollen flower buds of *Scrophularia nodosa* L. (Scrophulariaceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: very frequent (RÜBSAAMEN 1891c, ROSS 1916, JAAP 1919-1920, 1924-1925, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, BUHR 1939, BROMM 1964, HUBER 1969b, BUHR H.J. 2005, OSCHMANN 2000, STAUDT 2013). Distribution: European.

Contarinia scutati RÜBSAAMEN, 1910

White larvae live in deformed fruits of *Rumex scutatus* L. (Polygonaceae). Larvae pupate in the soil. More than one generation develops per year. Type locality: St. Goar. Occurrence: rare (RÜBSAAMEN 1910, NIESSEN 1937). Distribution: European.

Contarinia silvestris KIEFFER, 1897

Larvae develop in deformed pods of *Lathyrus sylvestris* L. (Fabaceae). Occurrence: rare (BUHR 1939, PICHINOT & MEYER 1998). Distribution: European.

Contarinia solani (RÜBSAAMEN, 1891)

Whitish larvae develop in swollen flower buds of *Solanum dulcamara* L. (Solanaceae). Type locality: Berlin. Occurrence: frequent (RÜBSAAMEN 1891b, HEDICKE 1917-1918, JAAP 1918, 1924-1925, 1928, SCHLEICHER 1935, STELTER 1954). Distribution: Eurosiberian.

Contarinia sorbi KIEFFER, 1896

White larvae develop in pod-like folded leaflets of *Sorbus aucuparia* L. (Rosaceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: very frequent (ROSS 1916, 1922c, JAAP 1918, 1919-1920, 1928, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, BROMM 1964, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, OSCHMANN 2000). Distribution: European.

Contarinia steini (KARSCH, 1881)

Whitish-yellow larvae live in swollen flower buds of *Silene latifola* POIR. (Caryophyllaceae). Two generations develop per year. Larvae pupate and hibernate in the soil. Type locality: Berlin. Occurrence: very frequent (KARSCH 1881, HEDICKE 1917-1918, JAAP 1918, ROSS 1916, 1922c, BUHR 1929, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, HAASE & UTECH 1971, MEYER 1984, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, BUHR H.J. 2013). Distribution: Eurosiberian.

Contarinia subulifex KIEFFER, 1897

Larvae develop in pointed galls on the upper side of the leaves of *Quercus cerris* L. (Fagaceae). Occurrence: very rare. Galls were found by H. Kretschmer in Darmstadt in May 2006 (Dr. A. Wehrmaker, pers. comm.). Distribution: Mediterranean.

Contarinia tanaceti RÜBSAAMEN, 1921

Orange-yellow larvae live in flower heads of *Tanacetum vulgare* L. (Asteraceae) among achenes. Occurrence: frequent (SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, PICHINOT & MEYER 1998). Distribution: Eurosiberian.

Contarinia thlaspeos RÜBSAAMEN, 1910

White larvae live in slightly swollen fruits of *Thlaspi arvense* L. (Brassicaceae). Type locality: Laacher See. Occurrence: frequent (RÜBSAAMEN 1910, STELTER 1954, BUHR 1966). Distribution: European.

Contarinia tiliarum (KIEFFER, 1890)

Yellow larvae cause conspicuous globular swellings on flower stalks, leaf petioles and young twigs of *Tilia cordata* MILL. and *T. platyphyllos* SCOP. (Tiliaceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: extremely frequent (HIERONYMUS 1890, RÜBSAAMEN 1890a, HEDICKE 1917b, 1917-1918, ROSS 1916, JAAP 1918, 1924-1925, 1928, BUHR 1929, 1939, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, ZELLER 1940, 1941, WEIDNER & WEIDNER 1951, MÖHN 1955a, KÜHLHORN 1957, BROMM 1964, HUBER 1969b, DREWECK 1980, SKUHRAVÁ & SKUHRAVÝ 1992a, KWAST 2012). Distribution: Eurosiberian.

Contarinia tragopogonis KIEFFER, 1909

Whitish yellow larvae live free among the achenes of the faded basically lightly swollen (BUHR 1965, #7153] flower heads of *Tragopogon pratensis* L. (Asteraceae). Several generations develop per year. Larvae pupate in the soil. Occurrence: rare (ROSS 1922c, HUBER 1969b, HAASE & UTECH 1971). Distribution: European.

Contarinia tremulae KIEFFER, 1909

White jumping larvae develop in rolled leaf margin of *Populus tremula* L. (Salicaceae) which is smooth and brillant. Occurrence: very rare (LUDWIG 1935, STAUDT 2013). Distribution: European.

Contarinia tritici (KIRBY, 1798)

Lemon or golden yellow gregarious larvae develop in spikelets of *Triticum aestivum* L. (Poaceae). It is an inconspicuous and often overlooked, but serious pest of wheat. One generation develops per year, but a second generation may occur. *C. tritici* is a serious pest of wheat in Europe (DARVAS et al. 2000). Occurrence: extremely frequent (WAGNER 1866, SACK 1907, SCHLEICHER 1935, KLEE 1936, HEINZE 1955, BASEDOW 1971, 1972, 1977, LÜBKE & WETZEL 1984, PICHINOT & MEYER 1998, LEHMHUS & HEIMBACH 2010, GAAFAR et al. 2011a, 2011b). Distribution: Holarctic, cosmopolitan.

Contarinia umbellatarum RÜBSAAMEN, 1910

Orange yellow larvae live in swollen flower buds of *Pimpinella saxifraga* L. (Apiaceae). Occurrence: frequent (RÜBSAAMEN 1910, JAAP 1918, BUHR 1929, SCHLEICHER 1935, SCHRÖPPEL 1983). Distribution: European.

Contarinia valerianae RÜBSAAMEN, 1890

White or whitish-yellow larvae live in swollen flower buds of *Valeriana officinalis* L. (Valerianaceae). Two generations develop per year. Type locality: Siegen. Occurrence: intermediate (RÜBSAAMEN 1890a, LUDWIG 1935, BROMM 1964, HUBER 1969b). Distribution: European.

Contarinia variabilis RÜBSAAMEN, 1917

Larvae live between fruits of *Rumex scutatus* L. (Polygonaceae). Type locality: St. Goar. Occurrence: very rare (RÜBSAAMEN 1917. Distribution: European.

Contarinia viburnorum KIEFFER, 1913

Yellow larvae develop in swollen flower buds of *Viburnum lantana* L. and *V. opulus* L. (Caprifoliaceae). Occurrence: frequent (ROSS 1916, LUDWIG 1935, HUBER 1969b, BUHR H.J. 2013). Distribution: European.

Contarinia vincetoxici KIEFFER, 1909

White larvae live in swollen flower buds of *Vincetoxicum hirundinaria* MEDIK. (Asclepiadaceae). Type locality: Bad Kreuznach. Occurrence: frequent (KIEFFER 1909, ROSS 1922c, JAAP 1925). Distribution: European.

Contarinia viticola RÜBSAAMEN, 1906

White, later yellow-white larvae live in swollen flower buds of *Vitis vinifera* L. (Vitaceae). Occurrence: very rare (RÜBSAAMEN 1906). Distribution: European.

Coquillettomyia dentata FELT, 1908

Picrodiplosis caricis MÖHN, 1955 (HARRIS 2004b)

Larvae of *P. caricis* were described as living free under leaf sheaths of *Carex* sp. (Cyperaceae). Adults were caught in the nature. Occurrence: frequent (MÖHN 1955a, 1955b, MEYER 1984, SKUHRAVÁ in WEBER 1995, WERNER 1997). Distribution: Holarctic.

Coquillettomyia extensa MAMAEV, 1973

Biology unknown. Adults were caught. Occurrence: very rare (MEYER 1984). Distribution: European.

Coquillettomyia lobata (FELT, 1907)

Biology unknown. Adults are usually caught in the nature. Occurrence: intermediate (MEYER 1984). Distribution: Holarctic.

Coquillettomyia mirifica (MARIKOVSKIJ, 1953)

Biology unknown. Adults were caught. Occurrence: very rare (WERNER 1997). Distribution: Euroasian.

Coquillettomyia umida (MÖHN, 1955)

Pelodiplosis umida MÖHN, 1955

Larvae live freely among fallen leaves of *Populus* (Salicaceae) and *Quercus* (Fagaceae). Type locality: Dauborn, Taunus. Occurrence: very rare (MÖHN 1955a, 1955b). Distribution: European.

Coquillettomyia uvae (MÖHN, 1955)

Strobilodiplosis uvae MÖHN, 1955

Larvae live freely in fallen cones of *Picea abies* (L.) KARSTEN (Pinaceae). Type locality: Hebertshausen near Munich. Occurrence: very rare (MÖHN 1955a, 1955b). Distribution: European.

Craneiobia corni (GIRAUD, 1863)

Orange-yellow larvae produce galls on the leaves of *Cornus sanguinea* L. (Cornaceae). Galls are hard, up to 12 mm high, each gall appears on the upper surface as a rounded swelling, on the lower surface as a flask-shaped projection. Each gall has one or several cavities, each cavity with a single larva. Full-grown larvae leave galls and hibernate in the soil. One generation develops per year. Occurrence: very frequent (V. SCHLECHTENDAL 1883, HIERONYMUS 1890, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1918, 1924-1925, BUHR 1929, 1966, MARESQUELLE 1931, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, MÖHN 1955a, HUBER 1969b, OSCHMANN 2000, KWAST 2012, STAUDT 2013). Distribution: European, Submediterranean.

Cupressatia siskiyou (FELT, 1917)

Janetiella siskiyou FELT, 1917; *Craneiobia lawsonianae* DE MEIJERE, 1935

Larvae live among scales in the cones of *Chamaecyparis lawsoniana* (MURRAY) PARL. (Cupressaceae). One generation per year. Larvae spin cocoons in cones and pupate there in the spring. Occurrence: rare (STELTER 1978a, 1988, BUHR H.J. 2013). Distribution: alien in Germany introduced to Europe from the Nearctis.

Cystiphora leontodontis (BREMI, 1847)

Cystiphora leontodontis KIEFFER, 1909

Reddish-yellow larvae develop in pustule galls on the leaves of *Leontodon hispidus* L. (Asteraceae). Full-grown larvae leave galls and pupate in the soil. Two and more generations develop per year. Occurrence: rare (BUHR 1929, HAASE & UTECH 1971). Distribution: European.

Cystiphora sanguinea (BREMI, 1847)

Cecidomyia hieracii F. LÖW, 1874; *Cystiphora pilosellae* KIEFFER, 1892

Orange larvae cause pustule galls on the leaves of *Hieracium murorum* L. and *H. pilosella* L. (Asteraceae). Two or more generations develop per year. Larvae pupate in the soil. Occurrence: extremely frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, BUHR 1929, 1939, 1966, WENGENMAYR 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, NIESSEN 1937, STELTER 1954, MÖHN 1955a, WEIDNER & WEIDNER 1951, WEIDNER 1962, HUBER 1969a, 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1982, 1984, SKUHRAVÁ & SKUHRAVÝ 1988, 1992b, PICHINOT & MEYER 1998, OSCHMANN 2000, STAUDT 2013). Distribution: European.

Cystiphora schmidti (RÜBSAAMEN, 1914)

Larvae cause pustule galls on leaves and stems of *Chondrilla juncea* L. (Asteraceae). Two or more generations develop per year. Larvae pupate in the soil. Occurrence: intermediate (HEDICKE 1917-1918, RÜBSAAMEN 1914). Distribution: European (Mediterranean), introduced to USA and Australia for biological control.

Cystiphora scorzonerae KIEFFER, 1909

Larvae cause blister galls on leaves of *Scorzonera humilis* L. (Asteraceae). Occurrence: very rare (F. LÖW 1888, ROSS 1922c, HUBER 1969b, SCHRÖPPEL 1984). Distribution: European.

Cystiphora sonchi (VALLOT, 1827)

Cecidomyia sonchi BREMI, 1847; *Cecidomyia sonchi* F. LÖW, 1875

Yellow-whitish larvae cause pustule galls on the leaves of *Sonchus oleraceus* L. and *S. arvensis* L. (Asteraceae). Two or more generations develop per year. A part of larvae pupates in galls, a part in the soil. Larvae hibernate in the soil. Occurrence: very frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, ROSS 1916, 1922d, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1928, BUHR 1929, 1939, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, NIESSEN 1937, HUBER 1969a, 1969b, DREWECK 1980, UTECH 1988a, 1988b, MEYER 1984, PICHINOT & MEYER 1998). Distribution: Eurosiberian, introduced to Canada for biological control.

Cystiphora taraxaci (KIEFFER, 1888)

Orange larvae cause pustule galls on the leaves of *Taraxacum officinale* WEB. (Asteraceae). Two or more generations develop per year. Larvae pupate and hibernate in the soil. Occurrence: very frequent (KIEFFER 1888a, RÜBSAAMEN 1890a, JAAP 1918, 1919-1920, 1924-1925, ROSS 1916, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, WEIDNER & WEIDNER 1951, WEIDNER 1962, MÖHN 1955a, HUBER 1969a, 1969b, 1974, ESCHELMÜLLER & KLEMENT 1974, DREWECK 1980, MEYER 1984, PICHINOT & MEYER 1998, SKUHRAVÁ & SKUHRAVÝ 1992a, OSCHMANN 2000, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian, introduced to Canada (Saskatchewan) for biological control.

Dasineura abietiperda (HENSCHEL, 1880)

Cecidomyia piceae HENSCHEL, 1881; *Cecidomyia piceae* HARTIG, 1893

Red or yellow-red larvae live in small cavities in the bark or timber of one year old twigs of *Picea abies* (L.) KARSTEN (Pinaceae). Only one generation develops per year. Larvae hibernate in galls. Occurrence: rare (HARTIG 1893, SCHNEIDER 1962, HUBER 1969b). Distribution: Euroasian.

Dasineura acrophila (WINNERTZ, 1853)

White larvae live gregariously and produce galls on leaflets of *Fraxinus excelsior* L. (Oleaceae). Attacked leaflet is folded upwards along mid-vein, each part becomes thickened and both parts form together a large cavity in which larvae develop. Usually all leaflets on young shoots are attacked. Only one generation develops per year. Larvae hibernate in the soil. Occurrence: very frequent (WINNERTZ 1853, RÜBSAAMEN 1890a, JAAP 1918, 1924-1925, 1928, ROSS 1916, 1922c, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, HUBER 1969b, ESCHELMÜLLER & KLEMENT 1974, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, SCHRÖPPEL 1982, PICHINOT & MEYER 1998, SKUHRAVÁ & SKUHRAVÝ 1992a, LEHMANN 2007). Distribution: European.

Dasineura acuminata (RÜBSAAMEN, 1915)

Yellow larvae cause leaf bud galls at the stem top of *Campanula rapunculoides* L. (Campanulaceae). Type locality: Jena. Occurrence: intermediate (RÜBSAAMEN 1915, JAAP 1925, LANGE 1936, BUHR 1966, OSCHMANN 2000, BUHR H.J. 2013). Distribution: European.

Dasineura affinis (KIEFFER, 1886)

At first white, later pale orange coloured larvae produce galls on the young leaves of *Viola reichenbachiana* JORD. ex BOREAU (Violaceae). Leaf margins are rolled up and thickened. Several larvae develop in one roll where they pupate in white cocoons. Two or more generations develop per year. GODAN (1956b, 1962) studied biology and ecology of this species. Occurrence: very frequent (HIERONYMUS 1890, HEDICKE 1917-1918, JAAP 1918, 1924-1925, BUHR 1929, 1939, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, NIESSEN 1938, HASE 1952, BROMM 1964, HUBER 1969b, HAASE & UTECH 1971, STELTER 1982d, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000, KWAST 2012). Distribution: European, North African.

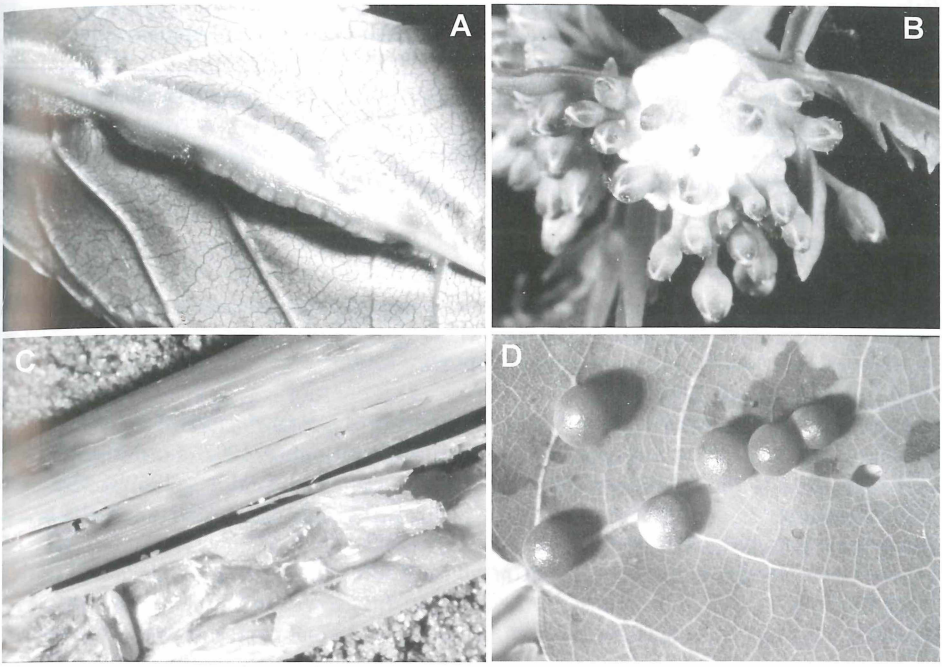

Fig. 2: Galls of *Dasineura fraxini* on *Fraxinus excelsior* (A), *Dasineura sisymbrii* on *Rorippa sylvestris* (B), *Giraudiella inclusa* on *Phragmites australis* (C), and *Harmandiola tremulae* on *Populus tremula* (D) (Photos: H. Meyer, J. Müller-Karch (B)).

Dasineura alopecuri (REUTER, 1895)
Solitary orange to brick-red larvae live in florets of *Alopecurus pratensis* L. (Poaceae). Larvae feed on developing seed. Only one larva develops in the floret. Usually one generation develops per year. Larvae hibernate in the florets where they pupate in the spring of the next year. This species may be considered a pest. Occurrence: intermediate (FRÖHLICH 1960, GREILER 1994). Distribution: European, immigrant in North America (Canada) and New Zealand.
Dasineura alpestris (KIEFFER, 1909)
Dasyneura schneideri RÜBSAAMEN, 1917; *Dasyneura arabis* BARNES, 1927
Red larvae cause leaf bud galls on *Arabis alpina* L. and *A. hirsuta* (L.) SCOP. (Brassicaceae). The leaves remain small and are deformed, densely covered with whitish hairs. Larvae pupate in white cocoons in galls. Occurrence: frequent (RÜBSAAMEN 1917, JAAP 1919-1920, ROSS 1916, 1922c, SCHLEICHER 1935, NIESSEN 1938, BUHR 1939, 1966, STELTER 1954, HUBER 1969b, SCHRÖPPEL 1981, BUHR H.J. 2013). Distribution: European.
Dasineura angelicae (RÜBSAAMEN, 1915)
Orange-yellow larvae live in swollen flower buds of *Angelica sylvestris* L. (Apiaceae). One generation per year. Larvae hibernate in the soil. Type locality: Triglitz/Prignitz. Occurrence: frequent (RÜBSAAMEN 1915, HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1930, SCHLEICHER 1935, LANGE 1936). Distribution: European.
Dasineura aparines (KIEFFER, 1889)

Pale sulphur-yellow larvae cause large galls on the growing tips of *Galium aparine* L. (Rubiaceae). Occurrence: very frequent (HEDICKE 1917-1918, JAAP 1918, ROSS 1916, 1922d, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, HUBER 1969b, HAASE & UTECH 1971, STELTER 1994b, BUHR H.J. 2013, STAUDT 2013). Distribution: European, North African.

Dasineura armoraciae (VIMMER, 1936)

Whitish-yellow larvae cause flower bud galls on *Armoracia rusticana* G.M. SCH. (Brassicaceae). Occurrence: frequent (JAAP 1922, LUDWIG 1925, BUHR 1960, BUHR H.J. 2013). Distribution: European.

Dasineura artemisiae (RÜBSAAMEN, 1915)

Orange-yellow larvae develop in slightly swollen flower heads of *Artemisia campestris* L. (Asteraceae) and also in galls of the gall midge *Rhopalomyia artemisiae* BOUCHÉ. Larvae pupate in the soil. Type locality: Bergedorf/Hamburg. Occurrence: very rare (JAAP 1928, PICHINOT & MEYER 1998). Distribution: European.

Dasineura asperulae (F. LÖW, 1875)

Orange red larvae produce spongy galls on stems of *Asperula tinctoria* L. and *A. cynanchica* L. (Rubiaceae). Occurrence: intermediate (GEISENHEYNER 1907, ROSS 1916, 1922c, JAAP 1925, BUHR 1960, NIESSEN 1937, WEIDNER & WEIDNER 1951, HUBER 1969b). Distribution: European.

Dasineura astragalorum (KIEFFER, 1909)

Larvae cause swellings on stems of *Astragalus arenarius* L. and *A. glycyphyllos* L. (Fabaceae). Occurrence: very rare (HIERONYMUS 1890 as „Stegelanschwellung"; WELZOW, 2010, leg. H. J. Buhr; Spremberg/Brandenburg; 2010, leg. E. Kwast pers. comm.). Distribution: European.

Dasineura auricomi (KIEFFER, 1909)

Larvae live greariously at the base of swollen fruits of *Ranunculus auricomus* L. (Ranunculaceae). Occurrence: rare (THOMAS 1892, JAAP 1918, 1928). Distribution: European.

Dasineura auritae (RÜBSAAMEN, 1915)

Yellow larvae cause marginal leaf rolls on *Salix aurita* L. and *S. cinerea* L. (Salicaceae), in each gall only one larva. Two generations develop per year. Larvae of summer generation pupate in the galls, of hibernating generation in the soil. Occurrence: very frequent (HIERONYMUS 1890, HEDICKE 1917-1918, JAAP 1918, 1928, ROSS 1916, 1922c, BUHR 1929, 1966, SCHLEICHER 1935, LANGE 1936, BROMM 1964, HUBER 1969b, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, STELTER 1989c, STAUDT 2013). Distribution: European.

Dasineura axillaris (KIEFFER, 1896)

Red larvae cause swollen leaf bud galls in axils of the stem of *Trifolium medium* L. (Fabaceae). Occurrence: very rare (BUHR 1965, #7177 mentioned that the galls are known from Germany, but referred to no locality). Distribution: European.

Dasineura berberidis (KIEFFER, 1909)

Larvae cause galls on young leaves at the vegetative tip of *Berberis vulgaris* L. (Berberidaceae). Leaf margin is rolled. Occurrence: very rare (JAAP 1919-1920, ROSS 1922c). Distribution: European.

Dasineura berteroae (STELTER, 1976)

Dirty white larvae cause flower bud galls on *Berteroa incana* (L.) DC. (Brassicaceae). Type locality: Warin/Wismar. Occurrence: very rare (STELTER 1970b, 1976, 1992c). Distribution: European.

Dasineura bistortae (KIEFFER, 1909)

Dasyneura polygoni RÜBSAAMEN, 1921

Slightly red larvae live in loosely rolled leaf margin on *Polygonum bistorta* L. (Polygonaceae). Occurrence: very frequent (RÜBSAAMEN 1890a, JAAP 1919-1920, 1924-1925, ROSS 1922c, BUHR 1939, 1966, LUDWIG 1935, LANGE 1936, BROMM 1964, SCHRÖPPEL 1983, OSCHMANN 2000). Distribution: Euroasian.

Dasineura bupleuri (WACHTL, 1883)

Orange red larvae cause deformations of the growing points or of a single leaf of *Bupleurum falcatum* L. (Apiaceae). Occurrence: intermediate (JAAP 1925, LANGE 1936, BUHR 1960). Distribution: European.

Dasineura campanulae (RÜBSAAMEN, 1914)

White larvae live in swollen flower buds of *Campanula rotundifolia* L. (Campanulaceae). Type locality: St. Goar. Occurrence: intermediate (RÜBSAAMEN 1914, JAAP 1919-1920, 1924-1925, ROSS 1922c, HUBER 1969b, SCHRÖPPEL 1981, OSCHMANN 2000). Distribution: European, North African

Dasineura capsulae (KIEFFER, 1901)

Perrisia cornifex KIEFFER, 1909

Orange coloured larvae produce hard galls on the growing points of *Euphorbia cyparissias* L. (Euphorbiaceae). Occurrence: very frequent (HIERONYMUS 1890, ROSS 1916, HEDICKE 1917-1918, JAAP 1923, 1924-1925, BUHR 1929, 1930, 1966, SCHLEICHER 1935, LANGE 1936, NIESSEN 1937, ZELLER 1941, 1942, WEIDNER & WEIDNER 1951, KÜHLHORN 1957, HAASE & UTECH 1971, LUDWIG 1974, OSCHMANN 2000). Distribution: European, North African.

Dasineura cardaminicola (RÜBSAAMEN, 1915)

Red larvae develop in swellings at the base of leaf petiole or flower stalk of *Cardamine amara* L. (Brassicaceae). Type locality: Stützerbach and Gehlberg (Thuringia). Occurrence: frequent (JAAP 1919-1920, 1924, ROSS 1922c, LANGE 1936, BUHR 1966, HUBER 1969b, SCHRÖPPEL 1981, OSCHMANN 2000). Distribution: European.

Dasineura cardaminis (WINNERTZ, 1853)

Red larvae cause flower bud galls on *Cardamine pratensis* L. (Brassicaceae). Occurrence: very frequent (WINNERTZ 1853, HIERONYMUS 1890, GEISENHEYNER 1907, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1930, 1939, LUDWIG 1935, SCHLEICHER 1935, BUHR H.J. 2013). Distribution: European.

Dasineura comosae (RÜBSAAMEN, 1915)

Larvae live in folded leaflets of *Hippocrepis comosa* L. (Fabaceae). Type locality: Hausberg near Jena. Occurrence: rare (ROSS 1922c, JAAP 1919-1920, 1925, HUBER 1969b, SCHRÖPPEL 1982). Distribution: European.

Dasineura corniculata (KIEFFER, 1909)

Larvae cause small horn pointed galls on leaves of *Lamium album* L. (Lamiaceae). Occurrence: very rare (RÜBSAAMEN 1895d). Distribution: European.

Dasineura corylina (KIEFFER, 1913)

Dasyneura coryli RÜBSAAMEN, 1912

Larvae live as inquilines in swollen catkins of *Corylus avellana* L. (Corylaceae) caused by the the gall midge *Contarinia coryli* (KALTENBACH). Occurrence: frequent (RÜBSAAMEN 1912, BUHR 1966, OSCHMANN 2000). Distribution: European.

Dasineura crataegi (WINNERTZ, 1853)

First whitish, later yellow and last red-yellowish larvae produce terminal rosette leaf galls on *Crataegus laevigata* (POIRET) DC. and *C. monogyna* JACQ. (Rosaceae). Some larvae pupate in galls, some larvae leave galls and pupate in the soil. Two generations per year. Occurrence: extremely frequent (WINNERTZ 1853, SCHRÖDER 1896, RÜBSAAMEN 1890a, HIERONYMUS 1890, KRÖBER 1910, ROSS 1916, 1922d, HEDICKE 1917a, 1917-1918, SCHULZE 1916a, JAAP 1918, 1919-1920, 1923, 1928, BUHR 1929, MARESQUELLE 1931, SCHLEICHER 1935,

LUDWIG 1935, BERGER 1936, LANGE 1936, ZELLER 1940, 1941, WEIDNER 1950, 1962, WEIDNER & WEIDNER 1951, KÜHLHORN 1957, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, ESCHELMÜLLER & KLEMENT 1974, SCHRÖPPEL 1981, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000, LEHMANN 2007, STAUDT 2013). Distribution: European, including Turkey.

Dasineura cytisi (KIEFFER, 1909)

White larvae live in the gall at vegetation tip of non-flowering shoots of *Chamaespartium sagittale* (L.) GIBBS (Fabaceae). Occurrence: very rare (BUHR 1964, #2960 mentioned it for Germany without referring to a locality). Distribution: Southeuropean.

Dasineura dioicae (RÜBSAAMEN, 1895)

Yellowish white larvae cause galls on *Urtica dioica* L. (Urticaceae). Leaf margin is slightly thickened and curled upwards. Type locality: Tegeler See. Occurrence: frequent (RÜBSAAMEN 1895c, HEDICKE 1917-1918, JAAP 1918, BUHR 1929, 1966, SCHLEICHER 1935, BROMM 1964). Distribution: European.

Dasineura dryophila (RÜBSAAMEN, 1917)

Slightly red larvae live as inquilines in leaf bud galls of the gall midge *Contarinia quercina* (RÜBS.) on *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). Occurrence: rare (RÜBSAAMEN 1917, JAAP 1918, PFÜTZENREITER & WEIDNER 1958). Distribution: European.

Dasineura engstfeldi (RÜBSAAMEN, 1889)

First whitish, later slightly red coloured larvae produce elongate swellings like wrinkles on the upper surface of the leaf blade on *Filipendula ulmaria* (L.) MAXIM. (Rosaceae). Occurrence: very frequent (RÜBSAAMEN 1889c, HIERONYMUS 1890, HEDICKE 1917-1918, JAAP 1918, 1928, ROSS 1922c, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, STELTER 1954, BRAUN 1983). Distribution: Eurosiberian.

Dasineura epilobii (F. LÖW, 1889)

Pale red larvae cause flower bud galls on *Epilobium angustifolium* L. (Onagraceae). Occurrence: very frequent (LÖW 1889a, RÜBSAAMEN 1890a, SACK 1907, ROSS 1916, 1922c, JAAP 1924-1925, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, ZELLER 1942, WEIDNER & WEIDNER 1951, STELTER 1954, BROMM 1964, SKUHRAVÁ & SKUHRAVÝ 1988,1992a, 1992b, OSCHMANN 2000, LEHMANN & FLÜGEL 2012). Distribution: Eurosiberian.

Dasineura erigerontis (RÜBSAAMEN, 1912)

Red larvae live in onion-shaped leaf bud galls on stem or vegetative tip of *Erigeron acris* L. (Asteraceae). Type locality: Rhine province. Occurrence: intermediate (GEISENHEYNER 1902, RÜBSAAMEN 1912, JAAP 1925, NIESSEN 1928, BUHR 1939). Distribution: European.

Dasineura excavans (KIEFFER, 1909)

Solitary larvae live in small depressions of 1 mm diameter on leaves of *Lonicera xylosteum* L. (Caprifoliaceae) which are surrounded by yellowish zones of 5-7 mm in diameter. Occurrence: intermediate (ROSS 1922c, JAAP 1924-1925, BUHR 1966, HUBER 1969b, OSCHMANN 2000). Distribution: European.

Dasineura fairmairei (KIEFFER 1896)

Red larvae develop in swollen flower buds of *Lathyrus sylvestris* L. (Fabaceae). Occurrence: very rare (BUHR 1964, #3729 mentioned it for Germany without referring to a locality). Distribution: Eurosiberian.

Dasineura festucae (BARNES, 1939)

Red larvae develop in the florets and seed cases of *Festuca rubra* L. (Poaceae). Occurrence: very rare (BARNES, 1939b, MEYER 1984: reared from *Festuca arundinacea* SCHREB.). Distribution: European.

Dasineura filipendulae (KIEFFER, 1909)

Larvae develop in swollen unopened flower buds of *Filipendula vulgaris* MOENCH (Rosaceae). Occurrence: very rare (V. SCHLECHTENDAL 1883). Distribution: European.

Dasineura foliumcrispans (RÜBSAAMEN, 1895)

Gregarious white larvae develop on lower side of the leaves of *Symphytum officinale* L. (Boraginaceae) and cause crinkling and yellowing of attacked leaves. Type locality: Siegen. Occurrence: rare (RÜBSAAMEN 1896, HEDICKE 1917-1918). Distribution: European.

Dasineura frangulae (RÜBSAAMEN, 1917)

Red-yellow larvae live in swollen flower buds of *Rhamnus frangula* L. (Rhamnaceae). Type locality: Triglitz/Prignitz. Occurrence: very rare (HEDICKE 1917-1918, JAAP 1918). Distribution: European.

Dasineura fraxinea (KIEFFER, 1907)

White larvae produce pustule galls on the leaflets of *Fraxinus excelsior* L. (Oleaceae). Only one larva develops in the gall. One generation develops per year. Larvae hibernate in the soil. It is evaluated as a minor pest (SKUHRAVÁ & ROQUES 2000). Occurrence: frequent (BAER 1907 (pest), ROSS 1916, JAAP 1928, BUHR 1929, 1966, SCHLEICHER 1935, LANGE 1936, HAASE & UTECH 1971, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, PICHINOT & MEYER 1998, OSCHMANN 2000). Distribution: European.

Dasineura fraxini (BREMI, 1847) (Fig. 2A)

Orange larvae cause swellings of the mid-vein on the leaflets of *Fraxinus excelsior* L. (Oleaceae). Usually one generation, rarely two generations develop per year. Larvae hibernate and pupate in the soil. It is evaluated as a minor pest (SKUHRAVÁ & ROQUES 2000). Occurrence: very frequent (ROSS 1916, 1922c, 1922d, HEDICKE 1917b, 1917-1918, JAAP 1918, 1919-1920, 1924-1925, 1928, BUHR 1929, 1939, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER 1950, HUBER 1969b, HAASE & UTECH 1971, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, SEGEBADE & SCHÄFFER 1979, DREWECK 1980, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, PICHINOT & MEYER 1998, KWAST 2012, STAUDT 2013). Distribution: European, North African.

Dasineura fructum (RÜBSAAMEN, 1895)

Orange-yellow larvae live on and inside slightly deformed fruits of *Cerastium fontanum* BAUMG. (Caryophyllaceae). Type locality: Berlin: Tegeler Weg. Occurrence: very rare (RÜBSAAMEN 1895d, HEDICKE 1917-1918, JAAP 1918). Distribution: European.

Dasineura fusca RÜBSAAMEN, 1914

Orange-yellow larvae live, probably as inquilines, in flower bud galls of the gall midge *Dasineura oxyacanthae* RBS. on *Crataegus laevigata* (POIRET) (DC.) (Rosaceae). Type locality: Germany. Occurrence: very rare (RÜBSAAMEN 1914). Distribution: European.

Dasineura galiicola (F. LÖW, 1880)

Orange-yellow larvae form artichoke-shaped galls on *Galium uliginosum* L. (Rubiaceae). Occurrence: very frequent (ROSS 1916, JAAP 1928, BUHR 1929, 1939, 1966, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, WEIDNER & WEIDNER 1951, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, PICHINOT & MEYER 1998). Distribution: Eurosiberian.

Dasineura geisenheyneri (KIEFFER, 1904)

Red larvae live in swollen flower buds of *Hippocrepis comosa* L. (Fabaceae). Type locality: Bad Kreuznach. Occurrence: intermediate (GEISENHEYNER 1902, KIEFFER 1904, JAAP 1925, HUBER 1969b, OSCHMANN 2000). Distribution: European.

Dasineura gentneri (PRICHARD, 1953)

Solitary larvae develop in flower buds in flower heads of *Trifolium repens* L. and *T. hybridum* L. (Fabaceae). They cause a considerable reduction in seed production. Full-grown larvae drop to the soil where they spin a cocoon. Several generations occur per

year (GAGNÉ 1989). Occurrence: very rare (MEYER 1984: reared from *Trifolium pratense* L., PICHINOT & MEYER 1998). Distribution: Holarctic: primarily European, immigrant to North America.

Dasineura geranii (KIEFFER, 1907)

Larvae develop gregariously in flowers and fruits of *Geranium sanguineum* L. (Geraniaceae). Occurrence: rare (JAAP 1919-1920, ROSS 1922c, HUBER 1969b). Distribution: Eurosiberian.

Dasineura glechomae (KIEFFER, 1889)

White larvae cause leaf bud galls on the growing points of *Glechoma hederacea* L. (Lamiaceae). Occurrence: frequent (RÜBSAAMEN 1890a, HEDICKE 1917-1918, JAAP 1918, 1928, ROSS 1922c, BUHR 1930, LUDWIG 1935, SCHLEICHER 1935, HUBER 1969b, ESCHELMÜLLER & KLEMENT 1974, 1977, KLEMENT & ESCHELMÜLLER 1978, SCHRÖPPEL 1984). Distribution: Eurosiberian, immigrant to USA (Maryland).

Dasineura gleditchiae (OSTEN SACKEN, 1866)

Larvae develop gregariously in folded leaflets of *Gleditsia triacanthos* L. (Fabaceae). Occurrence: rare (STELTER 1990b, BUHR H.J. 2013). Distribution: alien species, Nearctic, introduced to Europe.

Dasineura glyciphylli (RÜBSAAMEN, 1912)

Yellow-white larvae live in swollen folded leaflets of *Astragalus glycyphyllos* L. (Fabaceae). Type locality: Laacher See. Occurrence: frequent (ROSS 1922c, JAAP 1924-1925, BUHR 1929, 1960, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, SCHRÖPPEL 1980, OSCHMANN 2000). Distribution: European.

Dasineura harrisoni (BAGNALL, 1922)

Dasyneura jaapiana RÜBSAAMEN, 1917

According to HARRIS (2010) records from galls on *Filipendula vulgaris* MOENCH (Rosaceae) are treated as misidentifications of an undescribed *Dasineura* species, because RÜBSAAMEN's (1917: 50) description referred to *Filipendula ulmaria* (GILIB.) and not from the wrongly cited *Filipendula vulgaris*. Red larvae cause large cancerous galls on stems of *Filipendula ulmaria* (L.) MAXIM.). Larvae pupate in cocoons within the galls. Type locality of *D. jaapiana* RBS.: Triglitz/Prignitz, leg. Jaap. Occurrence: frequent (HEDICKE 1917-1918, JAAP 1918, 1928, SCHLEICHER 1935, LANGE 1936, BUHR 1960). Distribution: European.

Dasineura helianthemi (HARDY, 1850)

Cecidomyia helianthemi HARDY, 1850; *Contarinia helianthemi* (HARDY, 1850): RÜBSAAMEN & HEDICKE 1925-1939: 220; SKUHRAVÁ 1986: 239; *Dasineura helianthemi* (HARDY, 1850): HARRIS 2009b

Yellow red larvae live in terminal leaf bud galls on *Helianthemum nummularium* (L.) MILL. (Cistaceae). Occurrence: rare (HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European, North African.

Dasineura holosteae (KIEFFER, 1909)

Solitary white larvae develop in swollen seed capsules of *Stellaria holostea* L. (Caryophyllaceae). Occurrence: very rare (PICHINOT & MEYER 1998). Distribution: European.

Dasineura hygrophila (MIK, 1883)

Pale yellow larvae produce globular leaf galls on the growing points of *Galium palustre* L. (Rubiaceae). Occurrence: very frequent (HEDICKE 1917-1918, JAAP 1918, 1925, 1928, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000). Distribution: Eurosiberian.

Dasineura hyperici (BREMI, 1847)

Orange-yellow larvae cause leaf bud galls on *Hypericum perforatum* L. and other *Hypericum* species (Hypericaceae). Occurrence: very frequent (HIERONYMUS 1890, RÜBSAAMEN

1890a, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, ROSS 1922c, BUHR 1929, 1939, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, ZELLER 1940, 1941, 1942, WEIDNER & WEIDNER 1951, BROMM 1964, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000, LEHMANN & FLÜGEL 2012). Distribution: European.

Dasineura inflata STELTER, 1986

Yellow larvae develop in seed of *Carex otrubae* PODP. (Cyperaceae). Pupation takes place in the gall. Occurrence: very rare (STELTER 1986). Distribution: European.

Dasineura irregularis (BREMI, 1847)

Cecidomyia acercrispans KIEFFER, 1888

White larvae cause galls from leaves of *Acer pseudoplatanus* L. (Aceraceae). The leaves are wrinkled, curled and rolled upwards and their veins are hypertrophied and slightly swollen. Two generations develop per year. Pupation takes place in the soil. *D. irregularis* may be locally and occasionally a major pest of young maple trees grown in forest nurseries or in hedges (SKUHRAVÁ & ROQUES 2000). Occurrence: extremely frequent (V. SCHLECHTENDAL 1883, RÜBSAAMEN 1889a, HIERONYMUS 1890, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, 1928, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, WEIDNER 1950, WEIDNER & WEIDNER 1951, SKUHRAVÁ & SKUHRAVÝ 1988, STAUDT 2013). Distribution: European.

Dasineura kellneri (HENSCHEL, 1875)

Cecidomyia laricis F. LÖW, 1878

Solitary orange larvae develop in galls formed by lateral or flower buds of *Larix decidua* MILL. (Pinaceae). Attacked buds are swollen and capped with resin. Inside of the buds is a large chamber where larvae develop and pupate in the spring of the next year. One generation develops per year. It is a major pest of larch in Central Europe; locally and occasionally it may cause harm to larch trees but attack does not lead to the death (SKUHRAVÁ & ROQUES 2000). Occurrence: frequent (ROSS 1916, SCHREMMER 1960, POSTNER 1962a, 1963, 1982 (pest), BUHR 1966, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, KWAST 2012). Distribution: European.

Dasineura kiefferi (MARCHAL, 1896)

Whitish larvae develop in slightly swollen flower bud of *Hedera helix* L. (Araliaceae). Occurrence: very rare (BUHR H.J. 2013: galls were found near Dresden, 2009). Distribution: European.

Dasineura kiefferiana (RÜBSAAMEN, 1891)

Pale yellow larvae live in rolled leaf margin of *Epilobium angustifolium* L. (Onagraceae). Occurrence: very frequent (RÜBSAAMEN 1890a, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1919-1920, 1924-1925, 1928, BUHR 1929, 1939, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, BROMM 1964, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000, STAUDT 2013). Distribution: Eurosiberian.

Dasineura kleini (RÜBSAAMEN, 1891)

Larvae live as inquilines in flower bud galls caused by the gall midge *Contarinia nasturtii* (KIEFFER) on *Sisymbrium officinale* (L.) SCOP. (Brassicaceae). Occurrence: rare (RÜBSAAMEN 1891b). Distribution: European.

Dasineura koesterbecki STELTER, 1986

Orange-red larvae develop in seeds of *Carex acutiformis* EHRH. (Cyperaceae) and pupate in the soil. Type locality: Kösterbeck (District Rostock). Occurrence: very rare (STELTER 1986). Distribution: European.

Dasineura lamii (KIEFFER, 1909)

White larvae develop in swollen flower buds of *Lamium maculatum* L. (Lamiaceae). Occurrence: rare (ROSS 1922c, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.

Dasineura lamiicola (MIK, 1888)

White larvae live in leaf bud galls at the stem top of *Lamium maculatum* L. (Lamiaceae). Leaves are abnormally haired. Occurrence: very rare (ROSS 1916, WENGENMAYR 1929). Distribution: European.

Dasineura lathyri (KIEFFER, 1909)

White larvae live in folded slightly hypertrophied leaflets of *Lathyrus pratensis* L. (Fabaceae). Occurrence: very rare (ROSS 1922c: #783 as unknown gall midge). Distribution: Eurosiberian.

Dasineura lathyricola (RÜBSAAMEN, 1890)

Reddish larvae live in leaf bud galls on stems of *Lathyrus pratensis* L. (Fabaceae). Type locality: Siegen. Occurrence: frequent (RÜBSAAMEN 1890a, ROSS 1916, BUHR 1930, 1966, LUDWIG 1935, SCHLEICHER 1935, PICHINOT & MEYER 1998). Distribution: Eurosiberian.

Dasineura lathyrina (RÜBSAAMEN, 1890)

Yellow larvae live as inquilines in leaf bud galls caused by the gall midge *Dasineura lathyricola* (RÜBS.) on stems of *Lathyrus pratensis* L. (Fabaceae). Occurrence: rare (RÜBSAAMEN 1890a). Distribution: European.

Dasineura leguminicola (LINTNER, 1879)

Cecidomyia flosculorum KIEFFER, 1890

Yellow or pink larvae feed within the flowers of *Trifolium pratense* L. (Fabaceae) and prevent the development of seed. Full-grown larvae drop to the ground and pupate in the soil. Two or three generations develop per year. It is a pest of clover in central and northern Europe and is widespread in North America (DARVAS et al. 2000). GAGNÉ (1989) supposes that it is an immigrant from Europe. Occurrence: rare (BUHR 1966, MEYER 1984, PICHINOT & MEYER 1998). Distribution: European, secondarily Holarctic.

Dasineura linosyridis (MÖHN, 1958)

Larvae cause leaf galls on *Aster linosyris* (L.) BERNH. (Asteraceae) which are formed by swollen midveins. Type locality: Kyffhäuser, Ochsenburg. Occurrence: rare (MÖHN 1958, BUHR 1960). Distribution: European.

Dasineura lithospermi (LOEW, 1850)

Reddish larvae cause rosette leaf galls on *Lithospermum officinale* L. (Boraginaceae). Occurrence: frequent (ROSS 1916, SCHLEICHER 1935). Distribution: Eurosiberian.

Dasineura loewiana (RÜBSAAMEN, 1917)

Pale reddish larvae live in pod-like malformations of the leaflets on stems of *Vicia cracca* L., *V. tetrasperma* (L.) SCHREB. and *V. tenuifolia* ROTH (Fabaceae). Type locality: Bad Kreuznach. Occurrence: very frequent (HEDICKE 1917-1918, JAAP 1918, 1919-1920, ROSS 1922c, LUDWIG 1935, SCHLEICHER 1935, HUBER 1969b, STELTER 1992a, LEHMANN & FLÜGEL 2012). Distribution: European.

Dasineura loewii (MIK, 1882)

Pink larvae cause globular galls on the tips of flower stalks of *Euphorbia seguierana* NECKER (Euphorbiaceae). Occurrence: frequent (JAAP 1924; OSCHMANN 2000 mentioned similar galls on *Euphorbia virgata* W. & K. found by JAAP (1924) that could be caused by other gall midge species). Distribution: European.

Dasineura lotharingiae (KIEFFER, 1888)

Larvae cause galls at the top of stems and in swollen flower buds of *Cerastium glomeratum* THUILL. (Caryophyllaceae). Occurrence: very frequent (RÜBSAAMEN 1890a, HEDICKE

1917-1918, BUHR 1929, 1930, 1966, LUDWIG 1935, SCHLEICHER 1935, STELTER 1954, HUBER 1969b, MEYER 1984, PICHINOT & MEYER 1998). Distribution: European.

Dasineura lupulinae (KIEFFER, 1891)

Reddish yellow larvae cause pea-sized leaf galls on the stems of *Medicago lupulina* L. (Fabaceae). Occurrence: frequent (JAAP 1918, BUHR 1929, SCHLEICHER 1935, BOLLOW 1956, KÜHLHORN 1957, MEYER 1984). Distribution: European.

Dasineura mali (KIEFFER, 1904)

At first white, later red larvae develop in rolled leaf margins of *Malus domestica* BORKH. (Rosaceae). Infested leaves drop prematurely. Two or more generations develop per year. One part of larvae pupates in galls, other part drops to the ground and pupate in the soil. It is a serious pest of young apple trees and scions in orchards and in nurseries (DARVAS et al. 2000). Occurrence: very frequent (HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, 1928, ROSS 1922c, BUHR 1930, 1939, 1966, SCHLEICHER 1935, ZELLER 1942, LANGE 1936, HUBER 1969b, CARL 1980, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000). Distribution: Eurosiberian, Holarctic, immigrant in North America, Argentina and New Zealand.

Dasineura medicaginis (BREMI, 1847)

Cecidomyia ignorata WACHTL, 1884

Reddish-yellow to orange-yellow larvae develop in onion-shaped leaf bud galls on *Medicago sativa* L. and *M. falcata* L. (Fabaceae) in several generations per year. Larvae pupate in the soil. It is a serious pest of lucerne in Central Europe (DARVAS et al. 2000). Occurrence: extremely frequent (HIERONYMUS 1890, ROSS 1916, 1922d, HEDICKE 1917a, 1917-1918, JAAP 1918, 1923, 1924-1925, BUHR 1929, 1966, MARESQUELLE 1931, LEHMANN 1934, SCHLEICHER 1935, LANGE 1936, KLEMM 1937, NIESSEN 1937, ZELLER 1941, WEIDNER & WEIDNER 1951, UTECH 1988a, 1988b, OSCHMANN 2000, BUHR H.J. 2005). Distribution: Eurosiberian.

Dasineura miki (KIEFFER, 1909)

Larvae live in deformed flower heads of *Centaurea scabiosa* L. (Asteraceae). Occurrence: rare (BROMM 1964, SKUHRAVÁ & SKUHRAVÝ 1992a). Distribution: European.

Dasineura minoterminalis (STELTER, 1969)

Solitary larvae develop in terminal leaf buds of *Salix aurita* L., *S. caprea* L. and *S. cinerea* L. (Salicaceae) in one generation per year. Type locality: Teschendorf, Groß Lüsewitz. Occurrence: frequent (STELTER 1969c, 1977, SKUHRAVÁ & SKUHRAVÝ 1992a). Distribution: European.

Dasineura minungula STELTER, 1986

Solitary orange-red larvae develop in seeds of *Carex paniculata* L. (Cyperaceae) in one generation per year. Larvae pupate in the galls. Type locality: Kösterbeck (Rostock). Occurrence: very rare (STELTER 1986). Distribution: European.

Dasineura myosotidis (KIEFFER, 1902)

Larvae live in swollen flower buds of *Myosotis scorpioides* L. (Boraginaceae). Occurrence: rare (STELTER 1954, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.

Dasineura myrtilli (RÜBSAAMEN, 1915)

Dasineura myrtylli RÜBSAAMEN, 1915; SKUHRAVÁ (1986: 157), GAGNÉ (2004: 135) and GAGNÉ & JASCHHOF (2014: 181) incorrect spellings

RÜBSAAMEN (1915) decribed a female of this species which he reared from galls of the gall midge *Jaapiella vacciniorum* (KIEFFER) on *Vaccinium myrtillus* L. (Ericaceae). This species is probably an inquilin in the galls of this gall causer. Occurrence: frequent (JAAP 1918, 1924-1925, BUHR 1929, 1966). Distribution: European.

Dasineura napi (LOEW, 1850)

Cecidomyia brassicae WINNERTZ, 1853; *Dasineura brassicae* (WINNERTZ, 1853)
Whitish orange coloured larvae live gregariously in swollen and prematurely ripening and yellowing siliquas of *Brassica napus* L. ssp. *napus*, *B. oleracea* L. and other host plant species of the family Brassicaceae. Normal development of seed is disturbed. Several generations develop per year. Pupation takes place in the soil. It is a serious pest. The females usually use the puncture holes made by weevils *Ceutorhynchus obstrictus* (MARSHAM, 1802) (Coleoptera, Curculionidae) for egg-lying (DARVAS et al. 2000). Occurrence: very frequent (WINNERTZ 1853, HIERONYMUS 1890, HEDICKE 1917-1918, SCHLEICHER 1935, LANGE 1936, STELTER 1954, KLEMM 1957, BUHL 1960, BUHR 1966, PICHINOT & MEYER 1998, LABORIUS 2009). Distribution: European.

Dasineura nervicola (KIEFFER, 1909)
Larvae cause egg-shaped swellings on the midvein of *Hieracium lactucella* WALR. and *H. pilosella* L. (Asteraceae). Occurrence: very rare (ROSS 1922c). Distribution: European.

Dasineura odoratae STELTER, 1982
Larvae cause leaf galls on *Viola odorata* L. (Violaceae). Larvae pupate in the gall or in the soil. Type locality: Schmalkalden. Occurrence: intermediate (STELTER 1982d, BUHR H.J. 2013). Distribution: European.

Dasineura oxyacanthae (RÜBSAAMEN, 1914)
Red larvae live in swollen flower buds of of *Crataegus laevigata* (POIRET) DC. (Rosaceae). One generation develops per year. Type locality: Metternich. Occurrence: frequent (RÜBSAAMEN 1914, SCHLEICHER 1935, NIESSEN 1937, UTECH 1988a, 1988b, BUHR H.J. 2013). Distribution: European.

Dasineura papaveris (WINNERTZ, 1853)
Reddish yellow larvae develop in the seed capsules of *Papaver rhoeas* L. and *P. dubium* L. (Papaveraceae). Type locality: Aachen. Occurrence: intermediate (WINNERTZ 1853, JAAP 1918, BUHR 1966, KWAST 2012). Distribution: Euroasian.

Dasineura peinei (RÜBSAAMEN, 1890)
Yellow larvae live as inquilines in leaf galls caused by the gall midge *Dasineura sanguisorbae* (RÜBS.) on *Sanguisorba officinalis* L. (Rosaceae). Type locality: Weidenau. Occurrence: very rare (RÜBSAAMEN 1890a, 1890b). Distribution: European.

Dasineura periclymeni (RÜBSAAMEN, 1889)
Yellow-red larvae live in fleshy, thickened leaf rolled margins on *Lonicera periclymenum* L. (Caprifoliaceae). Type locality: Siegen. Occurrence: very frequent (RÜBSAAMEN 1889a, HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1929, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988, PICHINOT & MEYER 1998). Distribution: European.

Dasineura phyteumatis (F. LÖW, 1885)
Orange coloured larvae develop in swollen flower buds of *Phyteuma orbiculare* L. and *P. spicatum* L. (Campanulaceae). Only one generation develops per year. Larvae hibernate in the soil. Occurrence: frequent (LÖW 1885, ROSS 1916, 1922c, TOEPFER 1918, JAAP 1919-1920, 1924-1925, WEIDNER & WEIDNER 1951, BUHR 1966, HUBER 1969b, 1974, ESCHELMÜLLER & KLEMENT 1974, SCHRÖPPEL 1983, OSCHMANN 2000, BUHR H.J. 2013, STAUDT 2013). Distribution: European.

Dasineura plicatrix (LOEW, 1850)
White larvae live gregariously in contorted and twisted leaves on growing shoots of *Rubus caesius* L., *R. fruticosus* L. and other *Rubus*-species (Rosaceae). Several generations develop per year. Larvae pupate in the soil. It is evaluated as a minor pest of blackberry, loganberry and raspberry in northern Europe (DARVAS et al. 2000). Occurrence: extremely frequent (V. SCHLECHTENDAL 1981, RÜBSAAMEN 1890a, HEDICKE 1917-1918, JAAP

1918, 1923, 1928, 1924-1925, ROSS 1922c, BUHR 1929, 1939, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, ZELLER 1941, WEIDNER & WEIDNER 1951, MÖHN 1955a, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1992a, 1992b, STAUDT 2013). Distribution: European, North African, immigrant to Canada.

Dasineura poae (MÜHLE, 1957)

Larvae develop in the inflorescences of *Poa pratensis* L. (Poaceae). Type locality: Steinach near Straubing. Occurrence: intermediate (MÜHLE 1957, FRÖHLICH 1958a). Distribution: European.

Dasineura populeti (RÜBSAAMEN, 1889)

White larvae develop in rolled leaf margins on shoots of *Populus tremula* L. (Salicaceae). Several generations develop per year. Larvae pupate in the soil. Type locality: Siegen. Occurrence: extremely frequent (RÜBSAAMEN 1889a, HIERONYMUS 1890, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, ROSS 1922c, BUHR 1929, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, NIESSEN 1937, ZELLER 1940, 1942, WEIDNER 1950, WEIDNER & WEIDNER 1951, HUBER 1969b, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000, LEHMANN & FLÜGEL 2012, STAUDT 2013). Distribution: Eurosiberian.

Dasineura potentillae (WACHTL, 1885)

Orange red larvae develop gregariously in deformed flower buds of *Potentilla argentea* L. (Rosaceae). Occurrence: frequent (V. SCHLECHTENDAL 1883, WACHTL 1885, HEDICKE 1917-1918, ROSS 1922c, BUHR 1929, SCHLEICHER 1935, ZELLER 1941, LANGE 1936, HAASE & UTECH 1971). Distribution: Eurosiberian.

Dasineura pratensis (KIEFFER, 1909)

White gregarious larvae live in gall including deformed inflorescences of *Lathyrus pratensis* L. (Fabaceae). Occurrence: very rare (RÜBSAAMEN-HEDICKE 1925-1939, BUHR 1964: #3718 mentioned galls from Germany, but without giving localities). Distribution: European.

Dasineura praticola (KIEFFER, 1892)

First whitish, later yellow and in the end red larvae live in swollen flower buds of *Lychnis flos-cuculi* L. (Caryophyllaceae). Occurrence: intermediate (JAAP 1924-1925, LUDWIG 1935, STELTER 1954, OSCHMANN 2000). Distribution: European.

Dasineura procera (RÜBSAAMEN, 1914)

White larvae live in slightly swollen flower heads of *Aster linosyris* (L.) BERNH. (Asteraceae). Type locality: St. Goar. Occurrence: very rare (RÜBSAAMEN 1914, NIESSEN 1937). Distribution: European.

Dasineura pteridicola (KIEFFER, 1901)

White larvae develop in inconspicuous galls on leaflet margin of *Pteridium aquilinum* (L.) KUHN (Dennstaedtiaceae). The margin is bent, not rolled. Larvae hibernate in the soil. One generation develops per year. Occurrence: very frequent (HEDICKE 1917-1918, ROSS 1916, JAAP 1919-1920, 1924-1925, 1928, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, HUBER 1969b, DREWECK 1980, SCHRÖPPEL 1983, SKUHRAVÁ & SKUHRAVÝ 1992a, OSCHMANN 2000, KWAST 2012). Distribution: European.

Dasineura pteridis (MÜLLER, 1871)

Cecidomyia filicina KIEFFER, 1889

Orange yellow larvae develop in swollen rolled leaflet margin on *Pteridium aquilinum* (L.) KUHN (Dennstaedtiaceae). One generation develops per year. Larvae hibernate in the soil. This species was studied by WIECZOREK (1972/73). Occurrence: very frequent (RÜBSAAMEN 1890a, KÜSTER 1910, ROSS 1922c, JAAP 1928, BUHR 1929, 1966, LUDWIG 1935,

SCHLEICHER 1935, WEIDNER & WEIDNER 1951, DREWECK 1980, SKUHRAVÁ & SKUHRAVÝ 1992a, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian including Japan.

Dasineura pulsatillae (KIEFFER, 1894)

Red larvae develop inside fruits of *Pulsatilla vernalis* (L.) MILL. and *P. vulgaris* MILL. (Ranunculaceae). Occurrence: rare (JAAP 1918, SCHLEICHER 1935). Distribution: European.

Dasineura pustulans (RÜBSAAMEN, 1889)

White larvae live in depressions of the leaves of *Filipendula ulmaria* (L.) MAXIM. (Rosaceae). Type locality: Sieghütte, Siegen. Occurrence: extremely frequent (V. SCHLECHTENDAL 1883, RÜBSAAMEN 1889c, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1928, BUHR 1929, 1966, LUDWIG 1935, LANGE 1936, WEIDNER 1950, HUBER 1969b, 1974, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, BROMM 1983, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, OSCHMANN 2000, STAUDT 2013). Distribution: European.

Dasineura pyri (BOUCHÉ, 1847)

White larvae develop in curled and rolled leaf margins of *Pyrus communis* L. (Rosaceae). Two or more generations develop per year. Larvae pupate in the galls or in the soil. It may be occasionally a serious pest of pears, especially on young trees (DARVAS et al. 2000). Occurrence: very frequent (BEUTHIN 1887, HIERONYMUS 1890, RÜBSAAMEN 1890a, KRÖBER 1910, HEDICKE 1917-1918, JAAP 1918, 1924-1925, 1928, ROSS 1922c, BUHR 1930, MARESQUELLE 1931, SCHLEICHER 1935, LANGE 1936, NIESSEN 1937, MÖHN 1955a, HAASE & UTECH 1971, PICHINOT & MEYER 1998, OSCHMANN 2000, BUHR H.J. 2013). Distribution: Eurosiberian, immigrant in eastern Nearctic and New Zealand.

Dasineura ranunculi (BREMI, 1847)

Orange yellow larvae cause cornet-shaped leaf galls of *Ranunculus bulbosus* L. and *R. acris* L. (Ranunculaceae). Occurrence: extremely frequent (RÜBSAAMEN 1890a, GEISENHEYNER 1913, HEDICKE 1917-1918, ROSS 1916, 1922c, TOEPFER 1918, JAAP 1918, 1924-1925, 1928, BUHR 1929, 1930, 1939, 1966, LUDWIG 1935, SCHLEICHER 1935, NIESSEN 1938, ZELLER 1941, STELTER 1954, BROMM 1964, HUBER 1969b, HAASE & UTECH 1971, DREWECK 1980, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000, STAUDT 2013). Distribution: Eurosiberian.

Dasineura rapunculi (KIEFFER, 1906)

Red larvae develop in leaf bud gall on the vegetative tip or in flower buds of *Campanula rapunculus* L. (Campanulaceae). Occurrence: very rare (GEISENHEYNER 1913). Distribution: European.

Dasineura rosae (BREMI, 1847)

Cecidomyia rosarum HARDY, 1850; *Wachtliella rosarum* (HARDY, 1850): auctorum

Orange coloured larvae cause galls on leaflets of *Rosa canina* L. and some other species of *Rosa* (Rosaceae). The attacked leaflet is folded along the midvein and swollen forming a chamber where larvae develop. Several generations develop per year. Full-grown larvae leave galls; fall to the soil where they pupate. Occurrence: extremely frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, ROSS 1916, 1922c, 1922d, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, BUHR 1929, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, NIESSEN 1937, WEIDNER & WEIDNER 1951, BROMM 1964, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, ESCHELMÜLLER & KLEMENT 1974, SCHRÖPPEL 1983, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000, LEHMANN 2007, LEHMANN & FLÜGEL 2012, KRUSE 2009, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian, including Kazakhstan.

Dasineura rossi (RÜBSAAMEN, 1914)

Orange-yellow larvae develop among a cluster of deformed leaves of *Astragalus danicus*

RETZ. (Fabaceae) in several generations per year. Type locality: Gerolshofen (Bavaria). Occurrence: rare (RÜBSAAMEN 1914, ROSS 1916, BUHR 1960, WEIDNER & WEIDNER 1951). Distribution: European.

Dasineura rostratae STELTER, 1992

White larvae develop in siliquas of *Sisymbrium loeselii* L. (Brassicaceae). Type locality: Berlin. Occurrence: very rare (STELTER 1992c). Distribution: European.

Dasineura rubella (KIEFFER, 1896)

Whitish-pink larvae cause galls on young leaves of *Acer campestre* L. (Aceraceae). Two and more generations develop per year. Larvae pupate in the soil. This species damage cut trees in hedges. Occurrence: frequent (V. SCHLECHTENDAL 1883, LIEBEL 1886, JAAP 1924-1925, BUHR 1929, LANGE 1936, HUBER 1969b). Distribution: Eurosiberian.

Dasineura ruebsaameni (KIEFFER, 1909)

Whitish-yellow larvae cause parenchymous galls on leaves of *Carpinus betulus* L. (Corylaceae). Occurrence: intermediate (RÜBSAAMEN 1895d, HEDICKE 1917-1918, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.

Dasineura rumicicola (RÜBSAAMEN, 1914)

White larvae live as inquilines in deformed fruits of *Rumex scutatus* L. (Polygonaceae) together with larvae of the gall midge *Contarinia scutati* RÜBS. Type locality: Oberwesel am Rhein. Occurrence: very rare (RÜBSAAMEN 1914, NIESSEN 1937). Distribution: European.

Dasineura salviae (KIEFFER, 1909)

Red larvae live in swollen flower buds of *Salvia pratensis* L. (Lamiaceae). STELTER (1969a) desribed a male, female, larva and biology. Occurrence: intermediate (STELTER 1969a). Distribution: European.

Dasineura sampaina (TAVARES, 1902)

White larvae cause artichoke galls at tip of shoots of *Linum bienne* MILLER and *L. usitatissimum* L. (Linaceae). Occurrence: very rare (V. SCHLECHTENDAL 1890: "Germany"). Distribution: European.

Dasineura sanguisorbae (RÜBSAAMEN, 1890)

Red larvae develop gregariously in pod-like folded leaflets of *Sanguisorba officinalis* L. (Rosaceae). Type locality: Weidenau. Occurrence: frequent (RÜBSAAMEN 1890a, 1890b, ROSS 1916, LUDWIG 1935, BUHR 1960, HUBER 1969b, SCHRÖPPEL 1984, KWAST 2012). Distribution: Eurosiberian.

Dasineura saxifragae (KIEFFER, 1891)

Yellow larvae live in swollen flower buds of *Saxifraga granulata* L. (Saxifragaceae). Occurrence: rare (JAAP 1918, BUHR 1930, SCHLEICHER 1935). Distribution: European.

Dasineura schulzei (RÜBSAAMEN, 1917)

Red larvae develop in leaf bud galls on *Euphorbia palustris* L. (Euphorbiaceae). Type locality: Berlin. Occurrence: frequent (HEDICKE 1917-1918, SCHLEICHER 1935). Distribution: European.

Dasineura senecionis (RÜBSAAMEN, 1925)

Yellow larvae develop in swollen flower head of *Senecio nemorensis* subsp. *fuchsii* (GMEL.) CELAK. (Asteraceae). Occurrence: intermediate (JAAP 1919-1920: 24 (as *Dasyneura senecionis* RÜBS. n. sp., in litt.), ROSS 1922c, RÜBSAAMEN- HEDICKE 1925-1939, HUBER 1969b, SCHRÖPPEL 1984). Distribution: European.

Dasineura serotina (WINNERTZ, 1853)

White larvae cause leaf bud galls on *Hypericum humifusum* L. (Hypericaceae). Occurrence: frequent (WINNERTZ 1853, ROSS 1916, RÜBSAAMEN 1890a, JAAP 1928, LUDWIG 1935, BUHR 1966, BUHR H.J. 2013, STAUDT 2013). Distribution: European.

Dasineura silvicola (KIEFFER, 1909)
White larvae cause axillary leaf bud galls on *Stellaria holostea* L. (Caryophyllaceae). Type locality: Bad Kreuznach. Occurrence: very rare (KIEFFER 1909). Distribution: European.
Dasineura similis (F. LÖW, 1888)
Orange-yellow larvae cause terminal leaf bud galls on *Veronica scutellata* L. (Scrophulariaceae). Occurrence: frequent (HEDICKE 1917-1918, JAAP 1918, BUHR 1929, LUDWIG 1935, SCHLEICHER 1935). Distribution: European.
Dasineura sisymbrii (SCHRANK, 1803) (Fig. 2B)
Orange coloured larvae cause spongy galls on stems and inflorescences of *Rorippa palustris* (L.) BESS. (original description), other species of the genus *Rorippa* and also of *Barbarea* and *Sisymbrium* (Brassicaceae). Two or three generations develop in one year. Larvae pupate in the galls. Occurrence: extremely frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, GEISENHEYNER 1913, ROSS 1916, 1922d, HEDICKE 1917-1918, JAAP 1918, 1923, 1928, HARMS 1918, BUHR 1929, 1939, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, NIESSEN 1937, WEIDNER 1950, WEIDNER & WEIDNER 1951, STELTER 1954, MÖHN 1955a, BROMM 1964, HUBER 1969b, 1974, KLEMENT 1972, ESCHELMÜLLER & KLEMENT 1974, KLEMENT & ESCHELMÜLLER 1978, DREWECK 1980, SCHRÖPPEL 1981, 1983, PICHINOT & MEYER 1998, LEHMANN & FLÜGEL 2012, KWAST 2012). Distribution: Eurosiberian.
Dasineura sodalis (F. LÖW, 1877)
White larvae live as inquilines in galls of the gall midge *Dasineura tortrix* (F. LÖW) on *Prunus spinosa* L. (Rosaceae). Occurrence: rare (ROSS 1922c, LANGE 1936). Distribution: European.
Dasineura spadicea (RÜBSAAMEN, 1917)
Yellow larvae live in pod-like swollen leaflets of *Vicia cracca* L. (Fabaceae). STELTER (1992a) considered this species to be the gall causer. Type locality: Bad Kreuznach. Occurrence: very frequent (JAAP 1918, 1924-1925, 1928, ROSS 1922c, BUHR 1929, 1966, SCHLEICHER 1935, BROMM 1964, STELTER 1992a). Distribution: Eurosiberian.
Dasineura spicatae (KIEFFER, 1909)
Larvae cause galls on leaf buds and flower buds of *Veronica spicata* L. (Scrophulariaceae). Occurrence: very rare (v. SCHLECHTENDAL 1891). Distribution: European.
Dasineura stellariae (RÜBSAAMEN, 1915)
White larvae cause brown ovoid galls at the growing points of *Stellaria holostea* L. (Caryophyllaceae). Type locality: Sattenfeld near Bad Oldesloe (Holstein). Occurrence: frequent (RÜBSAAMEN 1915, JAAP 1924-1925, LUDWIG 1935, SCHLEICHER 1935, BUHR 1939, 1966, HUBER 1969b, OSCHMANN 2000). Distribution: European.
Dasineura stelteri GAGNÉ 2004
Dasineura barbareae STELTER, 1992 (preoccupied by *Cecidomyia barbareae* CURTIS, 1845)
Yellow-orange up red-orange larvae develop in siliquas of *Barbarea vulgaris* R. BR. (Brassicaceae). Two generations occur per year. Larvae pupate in the soil. Occurrence: very rare (STELTER, 1992c). Distribution: European.
Dasineura strumosa (BREMI, 1847)
Cecidomyia galeobdolontis WINNERTZ, 1853
Whitish larvae cause swollen leaf buds on young shoots of *Lamium galeobdolon* (L.) NATH. (Lamiaceae). Galls are situated usually under the ground. Occurrence: extremely frequent (WINNERTZ 1853, ROSS 1916, JAAP 1918, 1924-1925, 1928, BUHR 1929, 1966, LUDWIG 1935, LANGE 1936, WEIDNER & WEIDNER 1951, HUBER 1969b, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000, STAUDT 2013). Distribution: European.
Dasineura subterranea (KIEFFER, 1909)

Larvae develop in underground or ground level bud of *Silene vulgaris* (MOENCH) GARCKE (Caryophyllaceae). The bud is swollen, globular, pea-sized, and fleshy. Occurrence: very rare (ROSS 1922c, HUBER 1969b, SCHRÖPPEL 1984). Distribution: European.

Dasineura symphyti (RÜBSAAMEN, 1891)

White larvae develop in swollen flower buds of *Symphytum officinale* L. (Boraginaceae). Occurrence: frequent (HIERONYMUS 1890, RÜBSAAMEN 1891b, HEDICKE 1917-1918, JAAP 1924-1925, ROSS 1922c, SCHLEICHER 1935, LANGE 1936, NIESSEN 1937, HUBER 1969b, OSCHMANN 2000). Distribution: European.

Dasineura tetensi (RÜBSAAMEN, 1891)

Perrisia ribicola KIEFFER, 1909

At first white, later yellowish larvae live in folded and twisted leaves on terminal shoots of *Ribes nigrum* L. (Grossulariaceae). Type locality: Berlin. Three or four generations develop per year. Larvae pupate in the soil. Occasionally *D. tetensi* may be a serious pest of black currant (DARVAS et al. 2000). Occurrence: very frequent (RÜBSAAMEN 1891b, 1912, HEDICKE 1917-1918, JAAP 1918, 1924, BUHR 1930, SCHLEICHER 1935, BROMM 1964, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000). Distribution: Eurosiberian.

Dasineura tetrahit (KIEFFER, 1909)

White larvae live in swollen flower buds of *Galeopsis tetrahit* L. (Lamiaceae). Occurrence: very rare (BUHR 1964: #2840 mentioned galls from Germany without giving localities). Distribution: European.

Dasineura teucrii (TAVARES, 1903)

Perrisia teucriicola KIEFFER, 1909

Red larvae live gregariously in deformed buds of *Teucrium chamaedrys* L. (Lamiaceae). Occurrence: very rare (RÜBSAAMEN & HEDICKE 1925-1939). Distribution: Submediterranean.

Dasineura thomasi (KIEFFER, 1909)

Dasyneura thomasi RÜBSAAMEN, 1912

Red larvae live in rolled leaf margin of *Campanula cochleariifolia* LAM. (Campanulaceae). Occurrence: very rare (THOMAS 1892, JAAP 1919-1920, ROSS 1922c, HUBER 1969b, SCHRÖPPEL 1981). Distribution: European.

Dasineura thomasiana (KIEFFER, 1888)

Orange-reddish larvae develop in young terminal leaves or inside leaf buds of *Tilia platyphyllos* SCOP. and *T. cordata* MILL. (Tiliaceae). Attacked leaves are deformed and crinkled with hypertrophied veins. Two genarations develop per year. Larvae pupate and hibernate in the soil. Occurrence: very frequent (KIEFFER 1888a, RÜBSAAMEN 1890a, HIERONYMUS 1890, HEDICKE 1917b, 1917-1918, JAAP 1918, 1919-1920, 1925, 1928, ROSS 1922c, BUHR 1929, 1939, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, ZELLER 1941, WEIDNER & WEIDNER 1951, STELTER 1990c, OSCHMANN 2000). Distribution: European.

Dasineura tiliae (SCHRANK, 1803)

Cecidomyia tiliamvolvens RÜBSAAMEN, 1889

Red-yellow or orange coloured larvae cause galls on leaves of *Tilia platyphyllos* SCOP. and *T. cordata* MILL. (Tiliaceae). The gall is a rolled leaf margin that is fleshy and swollen. One generation develops per year. Larvae hibernate in the soil. Occurrence: very frequent (RÜBSAAMEN 1889a, ROSS 1916, 1922d, HEDICKE 1917b, 1917-1918, JAAP 1918, 1919-1920, 1924-1925, 1928, BUHR 1929, 1939, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, ZELLER 1940, MÖHN 1955a, HUBER 1969b, STELTER 1990c, SKUHRAVÁ & SKUHRAVÝ 1992a, PICHINOT & MEYER 1998, KRUSE 2009, OSCHMANN 2012, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Dasineura tortilis (BREMI, 1847)

Cecidomyia alni F. LÖW, 1877

First yellow, then orange red larvae cause galls on *Alnus glutinosa* (L.) GAERTN. and *A. incana* (L.) MOENCH (Betulaceae). Attacked leaf is folded upwards and the midvein and bases of lateral veins are thickened. One generation develops per year. Larvae hibernate in the soil. Occurrence: extremely frequent (THOMAS 1878, RÜBSAAMEN 1890a, HIERONYMUS 1890, HEDICKE 1917-1918, ROSS 1916, 1922c, JAAP 1918, 1919-1920, 1924-1925, 1928, BUHR 1929, 1939, 1966, BENICK 1932, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, BROMM 1964, DREWECK 1980, BRAUN 1983, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, PICHINOT & MEYER 1998, OSCHMANN 2000, STAUDT 2013). Distribution: European.

Dasineura tortrix (F. LÖW, 1877)

White larvae live gregariously in terminal leaf bud galls on *Prunus spinosa* L. and other species of the genus *Prunus* (Rosaceae). The gall is fusiform, terminal leaves are massed together and the leaf margins are losely rolled. One generation develops per year. Larvae hibernate in the soil. It is evaluated as a minor pest of young plum trees, mainly in fruitgrower nurseries (DARVAS et al. 2000). Occurrence: very frequent (V. SCHLECHTENDAL 1883, HEDICKE 1917-1918, JAAP 1918, 1923, 1925,1928, ROSS 1922c,1922d, BUHR 1929, SCHLEICHER 1935, LANGE 1936, SCHRÖPPEL 1980, OSCHMANN 2000. Distribution: European.

Dasineura traili (KIEFFER, 1909)

Larvae develop in swollen flower buds of *Ranunculus acris* L. (Ranunculaceae). Only the gall was described. Occurrence: very rare (LUDWIG 1935, #523 as unknown gall midge). Distribution: European.

Dasineura trifolii (F. LÖW, 1874)

Reddish-yellow larvae live in pod-like folded leaflets of *Trifolium repens* L. (Fabaceae). Several generations develop per year, larvae of summer generations pupate in the galls in white cocoons. In autumn larvae leave galls and hibernate in the soil. Occurrence: very frequent (RÜBSAAMEN 1890a, SACK 1907, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, BUHR 1929, 1939, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, ZELLER 1940, 1941, WEIDNER & WEIDNER 1951, BROMM 1964, HUBER 1969b, SCHRÖPPEL 1984, MEYER 1984, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000). Distribution: Eurosiberian, immigrant in USA.

Dasineura tubicoloides GAGNÉ, 2004

Cecidomyia tubicola KIEFFER, 1889 (not *Cecidomyia tubicola* OSTEN SACKEN 1862, now *Caryomyia tubicola*); *Dasineura tubicola* (KIEFFER, 1889)

Larvae cause tubular galls from leaf buds on the stems of *Cytisus scoparius* (L.) LINK (Fabaceae). Occurrence: frequent (KIEFFER, 1889, RÜBSAAMEN 1890a, HEDICKE 1917-1918, JAAP 1918, 1923, LUDWIG 1935, SCHLEICHER 1935, BUHR 1939). Distribution: European, Subatlantic.

Dasineura tubularis (KIEFFER, 1909)

Larvae cause galls on leaves of *Quercus cerris* L. (Fagaceae). The galls are hemispherical on the upper side and pipe-shaped on the lower leaf side. Occurrence: very rare (BUHR 1965: # 5592 mentioned galls from Bavaria without giving localities). Distribution: Mediterranean.

Dasineura tympani (KIEFFER, 1909)

Transparent larvae cause pustule galls on leaves of *Acer campestre* L. (Aceraceae). Occurrence: frequent (JAAP 1924-1925, BUHR 1966, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.

Dasineura ulmaria (BREMI, 1847)

Yellowish white larvae cause leaf galls on *Filipendula ulmaria* (L.) MAXIM. (Rosaceae). The gall is hemispherical on the upper side and cylindrical on the lower leaf side. Each gall contains one chamber where larva develops and pupates. Two or three generations develop per year. Occurrence: extremely frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, v. SCHLECHTENDAL 1883, SCHRÖDER 1896, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1928, ROSS 1916, 1922c, BUHR 1929, MARESQUELLE 1931, BENICK 1932, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, ZELLER 1940, WEIDNER 1950, 1962, WEIDNER & WEIDNER 1951, STELTER 1954, BUHR 1966, HUBER 1969b, 1974, HAASE & UTECH 1971, ESCHELMÜLLER 1972, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, DREWECK 1980, BRAUN 1983, MEYER 1984, SCHRÖPPEL 1984, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, PICHINOT & MEYER 1998, OSCHMANN 2000, LEHMANN & FLÜGEL 2012, STAUDT 2013). Distribution: Eurosiberian.

Dasineura ulmicola (KIEFFER, 1909)

White larvae cause small galls on on the upper leaf surface of *Ulmus minor* MILL. (Ulmaceae) with small elevations surrounded by lighter zones. Emergence openings are on the lower leaf surface. Occurrence: rare (THOMAS 1893, OSCHMANN 2000). Distribution: European.

Dasineura urticae (PERRIS, 1840)

Whitish-orange larvae cause irregular galls on leaves, stems and flower stalks of *Urtica dioica* L. (Urticaceae). The gall is rounded, unilocular with a mouth-like opening on the upper surface of the leaf. Two or more generations develop per year. Larvae pupate in the soil. Occurrence: extremely frequent (BEUTHIN 1887, RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, KRÖBER 1910, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, BUHR 1929, MARESQUELLE 1931, BENICK 1932, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, ZELLER 1940, 1942, WEIDNER 1962, WEIDNER & WEIDNER 1951, MÖHN 1955a, KÜHLHORN 1957, BROMM 1964, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, DREWECK 1980, MEYER 1984, SCHRÖPPEL 1984, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, PICHINOT & MEYER 1998, OSCHMANN 2000, LEHMANN & FLÜGEL 2012, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Dasineura viciae (KIEFFER, 1888)

White larvae live gregariously in pod-like folded and hypertrophied leaflets of *Vicia sepium* L., according to STELTER (1992a) also of *Vicia angustifolia* GRUFB. and *V. sativa* L. (Fabaceae). Two or three generations develop per year. Larvae pupate in the soil. Occurrence: extremely frequent (RÜBSAAMEN 1889a, 1890, HIERONYMUS 1890, ROSS 1916, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, BUHR 1929, 1939, 1966 SCHLEICHER 1935, LUDWIG 1935, NIESSEN 1937, WEIDNER & WEIDNER 1951, HUBER 1969b, 1974, HAASE & UTECH 1971, DREWECK 1980, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, STELTER 1992a, OSCHMANN 2000, STAUDT 2013). Distribution: Eurosiberian.

Dasineura violae (F. LÖW, 1880)

Pale orange-red larvae live gregariously in rosette leaf galls on *Viola arvensis* MURR. (Violaceae). Larvae pupate in galls in white cocoons. Several generations develop per year. Occurrence: very frequent (LÖW 1880, RÜBSAAMEN 1890a, HIERONYMUS 1890, v. SCHLECHTENDAL 1891, ROSS 1916, 1922d, HEDICKE 1917-1918, JAAP 1918, BUHR 1929, 1966, LUDWIG 1935, BERGER 1936, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, HUBER 1969b, 1974, STELTER 1982d, HAASE & UTECH 1971). Distribution: European.

Dasineura violahirtae STELTER, 1982

Larvae cause galls on *Viola hirta* L. (Violaceae). Galls are formed of slightly swollen leaf margins. Only one generation develops per year. Larvae hibernate and pupate in the

soil. Type locality: Barbarossahöhle (Kyffhäuser). Occurrence: frequent (HIERONYMUS 1890, JAAP 1924-1925, LUDWIG 1935, STELTER 1982d). Distribution: European.

Dasineura virgaeaureae (LIEBEL, 1889)

First white, later yellowish larvae develop in leaf bud galls on growing tip of *Solidago virgaurea* L. (Asteraceae). Occurrence: frequent. References: JAAP 1918, 1919-1920, 1928, BUHR 1929, 1966, SCHLEICHER 1935, BERGER 1936, SCHRÖPPEL 1984. Distribution: European.

Dasineura vitisidaea (KIEFFER, 1909)

Whitish larvae cause galls on vegetative tips of *Vaccinium vitis-idaea* L. (Ericaceae). Occurrence: intermediate (RÜBSAAMEN 1891c, SCHRÖPPEL 1984). Distribution: European.

Dasineura xylostei (KIEFFER, 1909)

Larvae cause small parenchymous pustule galls on leaves of *Lonicera xylosteum* L. (Caprifoliaceae). Occurrence: rare (ESCHELMÜLLER & KLEMENT 1974, SCHRÖPPEL 1982, OSCHMANN 2000). Distribution: European.

Dichodiplosis langeni RÜBSAAMEN, 1910

Mycophagous red larvae live in dried fruits of *Prunus spinosa* L. and *P. domestica* L. (Rosaceae). Type locality: Remagen. Occurrence: very rare (RÜBSAAMEN 1910). Distribution: European.

Didactylomyia longimana (FELT, 1908)

Biology unknown, probably mycophagous. Adults are associated with spider web. Occurrence: rare (SKUHRAVÁ in WEBER 1995). Distribution: cosmopolitan.

Didymomyia tiliacea (BREMI, 1847)

Cecidoyia tiliacea BREMI, 1847; *Cecidomyia frauenfeldi* KALTENBACH, 1872; *Hormomyia reaumuriana*. F. LÖW, 1878

Larvae produce hard woody galls on leaves of *Tilia platyphyllos* SCOP. and *T. cordata* MILL. (Tiliaceae). The gall is conical on upper side, hemispherical on lower leaf side. In summer a cylindrical inner part containing yellow larva separates from the rest swelling on the leaf and fall to ground where it remain up to the spring of the following year. Only one generation develops per year. Occurrence: extremely frequent (KALTENBACH 1874, RUDOW 1875a, 1875b, HIERONYMUS 1890, ROSS 1916, JAAP 1918, 1923, 1924-1925, BUHR 1929, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, ZELLER 1940, WEIDNER & WEIDNER 1951, BROMM 1964, HAASE & UTECH 1971, KLEMENT & ESCHELMÜLLER 1978, BRAUN 1983, OSCHMANN 2000, LEHMANN & FLÜGEL 2012, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Diodaulus linariae (WINNERTZ, 1853)

White larvae cause leaf rosette galls on the vegetative tips of the stem of *Linaria vulgaris* MILL. (Scrophulariaceae). Two generations develop per year. In summer larvae pupate in the gall, in winter in the soil. Occurrence: frequent (RÜBSAAMEN 1889a, JAAP 1928, BENICK 1932, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, BUHR 1939, MÖHN 1955a, HUBER 1969b). Distribution: Eurosiberian.

Diodaulus traili (KIEFFER, 1889)

Yellow larvae develop in swollen flower buds of *Pimpinella saxifraga* L. (Apiaceae). Occurrence: frequent (ROSS 1916, 1922c, JAAP 1918, 1924-1925, 1928, BUHR 1929, 1966, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, HUBER 1969b). Distribution: European.

Drisina glutinosa GIARD, 1893

Massalongia aceris RÜBSAAMEN, 1921

Solitary white larvae live in small depressions on the lower surface of the leaves of *Acer pseudoplatanus* L. (Aceraceae). The larva is surrounded by a drop of liquid. Full-grown larvae leave the gall and drop to the soil where they hibernate. Only one generation de-

velops per year (SKUHRAVÁ & SKUHRAVÝ 1986). From time to time it is a serious pest of maple in Central Europe (SKUHRAVÁ & ROQUES 2000). Occurrence: very frequent (RÜBSAAMEN 1890a, 1921, HEDICKE 1917-1918, JAAP 1919-1920, 1923, 1924-1925, ROSS 1922c, LUDWIG 1935, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, BUHR 1966, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, OSCHMANN 2000, STAUDT 2013). Distribution: European.

Dryomyia circinans (GIRAUD, 1861)

Larvae cause galls on leaves of *Quercus cerris* L. (Fagaceae). The gall consists of a disc covered with white hairs on the lower leaf side and an opening with circular elevation on the upper side. One larva develops in each gall. Only one generation develops per year. Full-grown larvae leave galls and fall to the soil where they hibernate and pupate in the spring. Occurrence: very rare. Only galls found by BEUTHIN (1887) in the surroundings of Hamburg. Distribution: Mediterranean.

Endopsylla agilis DE MEIJERE, 1907

Larvae develop as endoparasites in the body of the psyllid *Baeopelma foersteri* (FLOR, 1861); Hemiptera: Psyllidae) on *Alnus* sp. (Betulaceae). Occurrence: rare (SPEYER 1941 & KRÖBER 1956: reared from *Cacopsylla mali* (SCHMIDTEBERGER, 1836) living on *Malus domestica* BORKH. (Rosaceae). Distribution: European.

Feltiella acarisuga (VALLOT, 1827)

Feltiella tetranychi RÜBSAAMEN, 1910; *Therodiplosis persicae* KIEFFER, 1912; synonymy according to GAGNÉ (1995)

Larvae feed as predators on red spider mites (Acarina: Tetranychidae). Larvae pupate in white cocoons on leaves or in the soil. Several generations develop per year. This species is used for biological control of red spider mites in greenhouses. Occurrence: rare (RÜBSAAMEN 1910 & 1911, WEIHRAUCH 2006). Distribution: cosmopolitan.

Geocrypta braueri (HANDLIRSCH, 1884)

Larvae cause leaf bud galls on underground shoots of *Hypericum perforatum* L. (Hypericaceae). Occurrence: frequent (JAAP 1918, 1919-1920, 1928, ROSS 1922c, BUHR 1929, SCHLEICHER 1935, MÖHN 1955a). Distribution: European.

Geocrypta campanulae (MÜLLER, 1871)

Cecidomyia trachelii WACHTL, 1885

Red larvae cause onion-shaped galls on terminal or axillary buds of *Campanula rotundifolia* L. (Campanulaceae). Occurrence: very frequent (HIERONYMUS 1890, GEISENHEYNER 1902, HEDICKE 1917-1918, JAAP 1919-1920, 1924-1925, ROSS 1922c, BUHR 1939, 1966, WEIDNER & WEIDNER 1951, HUBER 1969b, ESCHELMÜLLER & KLEMENT 1974, SCHRÖPPEL 1981, OSCHMANN 2000). Distribution: European.

Geocrypta galii (LOEW, 1850)

Reddish-yellow larvae cause round bladder swellings on stems and flower stalks of *Galium mollugo* L., *G. verum* L. and other *Galium* species (Rubiaceae). The galls are solitary or gregarious and coalescent; their walls are fleshy, glossy, with a lateral opening. Inside each gall is one chamber. Several generations develop per year. Pupation and hibernation takes place in the soil. Occurrence: extremely frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, TOEPFER 1918, BUHR 1929, 1939, MARESQUELLE 1931, BENICK 1932, SCHLEICHER 1935, LUDWIG 1935, LANGE 1936, NIESSEN 1937, ZELLER 1941, WEIDNER 1950, 1962, WEIDNER & WEIDNER 1951, BROMM 1964, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, DREWECK 1980, SCHRÖPPEL 1981, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, PICHINOT & MEYER 1998, OSCHMANN 2000, LEHMANN 2007, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Geocrypta heterophylli (RÜBSAAMEN, 1914)
Red larvae cause rolled leaf margins of *Lathyrus heterophyllus* L. and *L. sylvestris* L. (Fabaceae). Larvae pupate in the galls. Type locality: Munich. Occurrence: intermediate. References: RÜBSAAMEN 1914, ROSS 1916, JAAP 1924-1925, OSCHMANN 2000. Distribution: Eurosiberian.
Gephyraulus diplotaxis (SOLINAS, 1982)
Larvae cause flower bud galls on *Diplotaxis muralis* (L.) DC. (Brassicaceae). Occurrence: very rare (LUDWIG 1935). Distribution: European.
Gephyraulus raphanistri (KIEFFER, 1886)
White larvae develop gregariously in unopened, swollen flower buds of *Raphanus raphanistrum* L. (Brassicaceae) in two generations per year. Larvae hibernate and pupate in the soil. Occurrence: very frequent (HIERONYMUS 1890, RÜBSAAMEN 1890a, ROSS 1916, 1922c, 1922d, HEDICKE 1917-1918, JAAP 1918, BUHR 1930, 1939, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, BUHR 1939, 1966, WEIDNER & WEIDNER 1951, STELTER 1954, MÖHN 1955a, PICHINOT & MEYER 1998). Distribution: European.
Giraudiella inclusa (FRAUENFELD, 1862) (Fig. 2C)
Giraudiella incurvans NIJVELDT, 1953
Solitary whitish or slightly pink larvae produce corn-like, hard woody galls inside the stem of *Phragmites australis* (CAV.) TRIN. (Poaceae). Two generations develop per year. Larvae pupate and also hibernate in the galls. TSCHARNTKE (1986, 1988a, 1988b, 1989, 1991, 1998, 1999) and GRABO 1991 studied biology and ecology. Occurrence: very frequent (HIERONYMUS 1890, RÜBSAAMEN 1892a, KRÖBER 1910, HEDICKE 1917-1918, JAAP 1928, BUHR 1929, 1966, SCHLEICHER 1935, FRÖMEL 1980, MEYER 1984, PICHINOT & MEYER 1998, KWAST 2012). Distribution: European.
Hadrobremia longiventris (KIEFFER, 1909)
Clinodiplosis trifolii KIEFFER 1909
Yellow larvae develop in swollen flower bud of *Trifolium medium* L. (Fabaceae). Occurrence: rare (JAAP 1925). Distribution: Eurosiberian.
Haplodiplosis marginata (VON ROSER, 1840)
Diplosis equestris WAGNER, 1871; *Haplodiplosis incerta* RÜBSAAMEN, 1926: RÜBSAAMEN & HEDICKE 1925-1939
Red larvae develop in saddle-shaped depressions (galls) on stems of *Triticum aestivum* L., *Hordeum vulgare* L., less of *Secale cereale* L., *Avena sativa* L. and also on some other species and genera of wild Poaceae, mainly of the tribe Triticeae (SKUHRAVÝ et al. 1983, 1993). Only one generation develops per year. Larvae hibernate in the soil where they pupate in the spring. It is a minor pest of cereals in northern Europe but a major pest of cereals in Central Europe (DARVAS et al. 2000). Occurrence: very frequent (V. ROSER 1840, WAGNER 1871, RÜBSAAMEN 1912, SCHLEICHER 1935, MÖHN 1955a, HEDDERGOTT 1960, 1963a, 1963b, WEIGAND 1972, WEIDNER 1985). Distribution: European.
Harmandiola cavernosa (RÜBSAAMEN, 1899)
Solitary orange red larvae produce large, thick walled galls on the leaves of *Populus tremula* L. (Salicaceae). The globular gall develops on the upper leaf side; it partly extends to the underside where it has a slit-like opening. One generation develops per year. Larvae hibernate in the soil. Occurrence: extremely frequent (ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, 1928, BUHR 1929, 1966, MARESQUELLE 1931, BENICK 1932, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, WEIDNER 1950, WEIDNER & WEIDNER 1951, BROMM 1964, HUBER 1969b, HAASE & UTECH 1971, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, DREWECK 1980, SCHRÖPPEL 1983, SKUHRAVÁ &

SKUHRAVÝ 1988, 1992a, OSCHMANN 2000, KRUSE 2009, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Harmandiola globuli (RÜBSAAMEN, 1889)

Solitary red yellow larvae produce small unilocular, globular, hard but thin walled galls on the upper side of the leaf of *Populus tremula* L. (Salicaceae). The slit-like opening is on the lower side. One generation develops per year. Larvae hibernate in the soil. Occurrence: extremely frequent (RÜBSAAMEN 1889a, HIERONYMUS 1890, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, BUHR 1929, 1966, MARESQUELLE 1931, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, ZELLER 1941, WEIDNER 1950, WEIDNER & WEIDNER 1951, MÖHN 1955a, HUBER 1969b, HAASE & UTECH 1971, KLEMENT & ESCHELMÜLLER 1978, DREWECK 1980, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, OSCHMANN 2000, KRUSE 2009, LEHMANN & FLÜGEL 2012, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Harmandiola populi (RÜBSAAMEN, 1917)

Solitary yellow larvae produce small, unilocular, globular, hard but thin-walled galls on the lower surface of the leaf of *Populus tremula* L. (Salicaceae), with the opening on the upper side. One generation develops per year. Hibernation takes place in the soil. Occurrence: very frequent (RÜBSAAMEN 1917, JAAP 1918, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, MÖHN 1955a, BROMM 1964, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, OSCHMANN 2000, BUHR H.J. 2005, LEHMANN & FLÜGEL 2012, KWAST 2012). Distribution: Eurosiberian.

Harmandiola pustulans (KIEFFER, 1909)

Larvae cause pustule galls on leaves of *Populus tremula* L. (Salicaceae). The wall of the gall is very thin. Round opening is either on the upper or on the lower side of the leaf. One generation develops per year. Larvae hibernate in the soil. Occurrence: frequent (BUHR 1966, DREWECK 1980, BUHR H.J. 2013). Distribution: European.

Harmandiola tremulae (WINNERTZ, 1853) (Fig. 2D)

Diplosis loewii RÜBSAAMEN, 1892

Solitary red larvae cause large, unilocular, globular, very hard and thick-walled galls on the upperside of the leaf of *Populus tremula* L. (Salicaceae). The opening is on the underside. One generation develops per year. Larvae hibernate in the soil. Occurrence: extremely frequent (WINNERTZ 1953, RUDOW 1875a, 1875b, HIERONYMUS 1890, RÜBSAAMEN 1890a, 1892b, SACK 1907, KRÖBER 1910, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1923, 1924-1925, BUHR 1929, 1966, MARESQUELLE 1931, BENICK 1932, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, WEIDNER 1950, 1962, WEIDNER & WEIDNER 1951, MÖHN 1955a, HAASE & UTECH 1971, DREWECK 1980, SKUHRAVÁ & SKUHRAVÝ 1992a, PICHINOT & MEYER 1998, OSCHMANN 2000, LEHMANN & FLÜGEL 2012, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian, including Kazakhstan.

Hartigiola annulipes (HARTIG, 1839)

Cecidomyia piligera LOEW, 1850

Solitary white larvae produce cylindrical galls on the upperside of the leaves of *Fagus sylvatica* L. (Fagaceae). One generation develops per year. In autumn the full-grown larvae close the opening at the base of the gall by a lid. The galls separate from the leaves and fall to the soil where larvae hibernate hidden in the galls. In the spring the larvae pupate inside the galls and then the adult gall midges emerge. Occurrence: extremely frequent (BEUTHIN 1887, RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, KÜSTER 1910, KRÖBER 1910, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, BUHR 1929, MARESQUELLE 1931, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, NIESSEN 1937, ZELLER 1942, WEIDNER 1950, 1962, WEIDNER & WEIDNER 1951, MÖHN 1955a,

KÜHLHORN 1957, HUBER 1969b, HAASE & UTECH 1971, ESCHELMÜLLER & KLEMENT 1974, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, SEGEBADE & SCHÄFFER 1979, DREWECK 1980, SCHRÖPPEL 1981, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000, BOGENSCHÜTZ 2006, LEHMANN 2007, KRUSE 2009, STAUDT 2013). Distribution: European, including Turkey and Caucasus.

Herbomyia robusta MÖHN, 1955

Larvae live freely under the leaf sheath of *Carex* sp. (Cyperaceae) where they pupate in cocoons. Type locality: Dauborn. Occurrence: very rare (MÖHN 1955a, 1955b). Distribution: European.

Holobremia fallacicornis (KIEFFER, 1904)

Biology unknown. A single male was caught on old oak wood. Occurrence: very rare (RÜBSAAMEN & HEDICKE 1925-1939), WERNER (1997) caught the species from compost stack and dump on waste disposal facilities near Berlin, det. Spungis). Distribution: European.

Hybolasioptera fasciata (KIEFFER, 1904)

Lasioptera cerealis, var. *fasciata* KIEFFER, 1904

Larvae live in depressions of stems of *Secale cereale* L., *Triticum aestivum* L., *Elymus repens* (L.) GOULD and other species and genera of Poaceae. Occurrence: frequent (RÜBSAAMEN 1895a, v. SCHLECHTENDAL 1895, SACK 1907, HEDICKE 1917-1918, MÖHN 1955a, 1968, STELTER 1970b). Distribution: European.

Hygrodiplosis vaccinii (KIEFFER, 1897)

Yellow or reddish larvae cause galls on *Vaccinium uliginosum* L. (Ericaceae). The leaf margin is rolled downwards and thickened. Occurrence: rare (JAAP 1922). Distribution: European.

Hyperdiplosis bryanti FELT, 1913

Biology unkown. Adults were caught. Occurrence: very rare (MEYER 1984). Distribution: Holarctic.

Hyperdiplosis lobata FELT, 1907

Biology unkown. Adults were caught. Occurrence: very rare (MEYER 1984). Distribution: Holarctic.

Inulomyia subterranea (FRAUENFELD, 1861)

Larvae cause underground, thick-walled galls, densely covered with hairs, which are situated on the root neck of *Inula ensifolia* L. (Asteraceae). Occurrence: very rare (BUHR 1960, STELTER & BUHR 1965: reared from *Inula hirta* L. and *I. salicina* L). Distribution: Eurosiberian.

Iteomyia capreae (WINNERTZ, 1853)

First white, then orange, at maturity red larvae produce small hemispherical galls on the leaves of *Salix caprea* L., *S. aurita* L. and its hybrids and relatives (Salicaceae). The circular opening is on the lower surface of the leaf. Each gall includes one larva. When full-grown, larvae leave galls, drop to the soil where they hibernate. One generation develops per year. Occurrence: extremely frequent (WINNERTZ 1853, RUDOW 1875a, 1875b, RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, KÜSTER 1910, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, TOEPFER 1918, BUHR 1929, MARESQUELLE 1931, BENICK 1932, SCHLEICHER 1935, BERGER 1936, LANGE 1936, NIESSEN 1937, WEIDNER 1950, WEIDNER & WEIDNER 1951, MÖHN 1955a, BROMM 1964, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, ESCHELMÜLLER & KLEMENT 1974, SEGEBADE & SCHÄFFER 1979, DREWECK 1980, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000, LEHMANN 2007, LEHMANN & FLÜGEL 2012, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Iteomyia major (KIEFFER, 1898) (Fig. 3A)

Pale orange coloured larvae produce large irregular, plurilocular swellings of leaf veins on *Salix caprea* L. and *S. cinerea* L. (Salicaceae). The gall has many chambers with openings on the lower side. One generation develops per year. Larvae hibernate in the soil. Occurrence: very frequent (HIERONYMUS 1890, ROSS 1916, 1922d, JAAP 1924-1925, 1928, BUHR 1929, SCHLEICHER 1935, ZELLER 1940, LANGE 1936, HUBER 1969b, 1974, HAASE & UTECH 1971, DREWECK 1980, LEHMANN & FLÜGEL 2012, KWAST 2012, STAUDT 2013). Distribution: European.

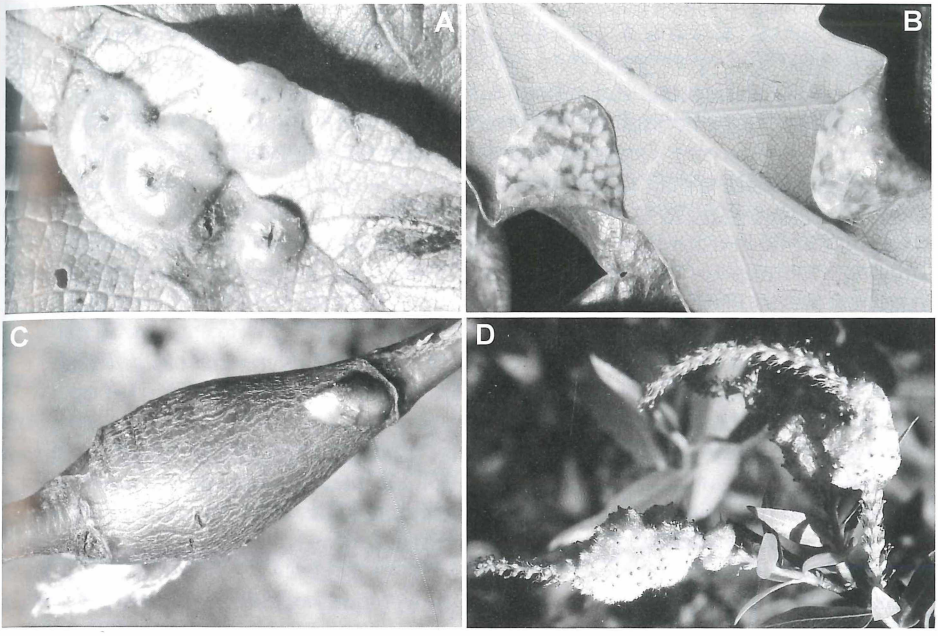

Fig. 3: Galls of *Iteomyia major* on *Salix caprea* (A), *Macrodiplosis pustularis* on *Quercus robur* (B), *Rabdophaga dubiosa* on *Salix caprea* (C), and *Rabdophaga heterobia* on *Salix triandra* (D) (Photos: H. Meyer).

Jaapiella alpina (F. LÖW, 1885)

Red larvae develop gregariously in leaf bud galls on non-flowering plants of *Silene acaulis* (L.) JACQ. (Caryophyllaceae). Only one generation develops per year. Occurrence: very rare (ROSS 1922c: Berchtesgaden, 2000 m, Kirchlespitze 2100 m, BUHR 1965: #6576 Botanical Garden in Rostock: introduced). Distribution: European; Alpine and Subalpine species with disjunctive distribution (SKUHRAVÁ 1987).

Jaapiella bryoniae (BOUCHÉ, 1847)

White larvae cause large leaf bud galls on the tips of *Bryonia alba* L. and *B. dioica* JACQ. (Cucurbitaceae). Occurrence: frequent (KALTENBACH 1874, HIERONYMUS 1890, SACK 1907, HEDICKE 1917-1918, ROSS 1922c, JAAP 1923, SCHLEICHER 1935, NIESSEN 1937, WEIDNER & WEIDNER 1951, STELTER 1954, MÖHN 1955a, HUBER 1969b, PICHINOT & MEYER 1998). Distribution: European, North African.

Jaapiella buhri STELTER, 1975

White larvae develop in rolled leaflet margins of *Peucedanum oreoselinum* (L.) MOENCH (Apiaceae). Type locality: Bocksberg in NSG Kösterbeck (Rostock). Occurrence: rare (STELTER 1975b). Distribution: European.

Jaapiella catariae RÜBSAAMEN, 1915

Pink larvae develop in swollen flower buds of *Nepeta cataria* L. (Lamiaceae). Type locality: Triglitz/Prignitz. Occurrence: rare (HEDICKE 1917-1918, JAAP 1918, LANGE 1936, SYLVÉN & TASTÁS-DUQUE 1993). Distribution: European.

Jaapiella cirsiicola RÜBSAAMEN, 1915

Red larvae live in poorly developed flower heads of *Cirsium acaule* SCOP. and *C. arvense* (L.) SCOP. (Asteraceae). Type locality: Triglitz/Prignitz. Occurrence: frequent (HEDICKE 1917-1918, JAAP 1918, 1924-1925, SCHLEICHER 1935, BUHR 1939, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, SYLVÉN & LINDBERG 1998, OSCHMANN 2000). Distribution: Eurosiberian.

Jaapiella clethrophila RÜBSAAMEN, 1917

Yellow larvae, with the head and abdominal parts reddish coloured, live as inquilines in galls caused by the gall midge *Dasineura tortilis* (BREMI) on the leaves of *Alnus glutinosa* (L.) GAERTN. (Betulaceae). Occurrence: intermediate (JAAP 1924-1925, SCHLEICHER 1935, OSCHMANN 2000). Distribution: European.

Jaapiella compositarum (KIEFFER, 1888)

Larvae live in flower heads of *Hypochoeris glabra* L. (Asteraceae) without making malformation. Occurrence: frequent (RÜBSAAMEN 1890a, 1915, SKUHRAVÁ & SKUHRAVÝ 1992a, PICHINOT & MEYER 1998). Distribution: European.

Jaapiella crinita (RÜBSAAMEN, 1891)

White larvae live as inquilines in galls of the gall midge *Contarinia jacobaeae* (LOEW) on *Senecio vulgaris* L. (Asteraceae). Type locality: Siegen. Occurrence: rare (RÜBSAAMEN 1891c, 1891e). Distribution: European.

Jaapiella dittrichi (RÜBSAAMEN, 1895)

Red larvae live gregariously on upper side of deformed leaflets of *Silaum silaus* (L.) SCHINZ & THELL. (Apiaceae). Occurrence: intermediate (ROSS 1916, JAAP 1919-1920, 1924-1925, HUBER 1969b, SCHRÖPPEL 1984). Distribution: European.

Jaapiella floriperda (F. LÖW, 1888)

Reddish larvae live gregariously in swollen flower buds of *Silene vulgaris* (MOENCH) GARCKE (Caryophyllaceae). Occurrence: intermediate (ROSS 1922c, JAAP 1924-1925, LANGE 1936). Distribution: European.

Jaapiella genistamtorquens (KIEFFER, 1888)

Pink larvae live gregariously in leaf bud galls on stem of *Genista pilosa* L (Fabaceae). Occurrence: frequent (v. SCHLECHTENDAL 1883, HEDICKE 1917-1918, JAAP 1918, 1923, SCHLEICHER 1935). Distribution: European, Subatlantic.

Jaapiella genisticola (F. LÖW, 1877)

First white, then pale rose coloured larvae cause galls at the growing top of *Genista tinctoria* L. (Fabaceae). Terminal leaves are tufted, swollen, forming a yellowish hairy mass about the size of a hazel nut. Occurrence: extremely frequent (LÖW 1877, HIERONYMUS 1890, SACK 1907, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1923, 1924-1925, BUHR 1929, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, WEIDNER & WEIDNER 1951, BROMM 1964, HUBER 1969b, DREWECK 1980, OSCHMANN 2000). Distribution: Eurosiberian.

Jaapiella hedickei RÜBSAAMEN, 1921

Yellow-red larvae live in swollen leaf sheaths of *Pimpinella saxifraga* L. (Apiaceae). Occurrence: frequent (HEDICKE 1922, BUHR 1966, LANGE 1936, NIESSEN 1938, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: Eurosiberian.

Jaapiella hypochoeridis SYLVÉN, 1998

Orange larvae live in flower head of *Hypochoeris radicata* L. (Asteraceae). Type locality: Leck (corrected by collector H. Meyer). Occurrence: very rare (SYLVÉN & LINDBERG 1998). Distribution: European.

Jaapiella inflatae (RÜBSAAMEN, 1914)

White larvae live in swollen flower buds of *Silene vulgaris* (MOENCH) GARCKE (Caryophyllaceae). Type locality: Koblenz. Occurrence: frequent (RÜBSAAMEN 1914, ROSS 1922c, LANGE 1936). Distribution: European.

Jaapiella jaapiana (RÜBSAAMEN, 1914)

White or pale yellow larvae develop in pod-like folded leaflets of *Medicago lupulina* L. (Fabaceae). Type locality: Triglitz/Prignitz. Occurrence: intermediate (HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1929, 1939, SCHLEICHER 1935). Distribution: European.

Jaapiella knautiae RÜBSAAMEN, 1917

White larvae live in leaf bud galls of *Knautia arvensis* (L.) COULT. (Dipsacaceae). Type locality: Jena. Occurrence: frequent (GEISENHEYNER 1913, JAAP 1919-1920, 1924-1925, ROSS 1922c, BUHR 1960, 1966, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1982, OSCHMANN 2000). Distribution: European.

Jaapiella loticola (RÜBSAAMEN, 1889)

Reddish or orange coloured larvae develop in leaf bud galls at the tip of shoots of *Lotus corniculatus* L. (Fabaceae). Type locality: Siegen. Occurrence: frequent (RÜBSAAMEN 1889a, HEDICKE 1917-1918, JAAP 1918, 1924-1925, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, STELTER 1954, 1975b SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: Eurosiberian.

Jaapiella medicaginis (RÜBSAAMEN, 1912)

Pink larvae develop in pod-like folded leaflets of *Medicago sativa* L. and *M. falcata* L. (Fabaceae). Two or more generations develop per year. Larvae pupate in the soil. It is a minor pest of lucerne (DARVAS et al. 2000). Occurrence: very frequent (HEDICKE 1917-1918, ROSS 1922d, JAAP 1923, 1924-1925, LANGE 1936, STELTER 1954, 1975b, BROMM 1964, BUHR 1966). Distribution: Eurosiberian.

Jaapiella parvula (LIEBEL, 1889)

Whitish larvae develop in flower buds of *Bryonia dioica* JACQ. (Cucurbitaceae). Occurrence: rare (JAAP 1923). Distribution: European.

Jaapiella picridis (RÜBSAAMEN 1912)

White larvae develop in frilled leaves of *Picris hieracioides* L. (Asteraceae). Type locality: Rheinprovinz. Occurrence: rare (RÜBSAAMEN 1912, BUHR 1960). Distribution: European.

Jaapiella rubicundula (RÜBSAAMEN, 1891)

Red larvae live in deformed flower buds of *Rumex acetosella* L. (Polygonaceae). Type locality: Siegen. Occurrence: frequent (RÜBSAAMEN 1891b, 1891c, HEDICKE 1917-1918, JAAP 1918, 1928, SCHLEICHER 1935, LANGE 1936, BUHR 1939, WEIDNER 1962). Distribution: European.

Jaapiella sarothamni RÜBSAAMEN, 1917

Red larvae develop in swollen flower buds of *Cytisus scoparius* (L.) LINK (Fabaceae). Type locality: Triglitz/Prignitz. Occurrence: very rare (HEDICKE 1917-1918, JAAP 1918). Distribution: European.

Jaapiella scabiosae (KIEFFER, 1888)

Whitish larvae develop gregariously in strongly pubescent galls on vegetative tips or in rolled leaves of *Scabiosa columbaria* L. (Dipsacaceae). Occurrence: frequent (KIEFFER 1888a, ROSS 1916, 1922c, TOEPFER 1918, JAAP 1919-1920, 1924-1925, NIESSEN 1937, BUHR 1939, 1960, HUBER 1969b, STELTER 1975b, SCHRÖPPEL 1984, OSCHMANN 2000). Distribution: European.

Jaapiella schmidti (RÜBSAAMEN, 1912)

Red larvae develop in seed capsules of *Plantago lanceolata* L., (Plantaginaceae) and feed by sucking the seed. Type locality: St. Goar. Occurrence: frequent (RÜBSAAMEN 1912, JAAP 1918, NIESSEN 1937, BUHR 1966, MEYER 1984 (reared from *Plantago maritima* L.), PICHINOT & MEYER 1998, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a). Distribution: European.

Jaapiella thalictri (RÜBSAAMEN, 1895)

Red larvae develop among small leaves in bud galls at shoot tips of *Thalictrum flavum* L. (Ranunculaceae) or in swollen flower buds that remain closed. Type locality: Berlin. Occurrence: frequent (RÜBSAAMEN 1895b, ROSS 1916, HEDICKE 1917-1918, JAAP 1928, SCHLEICHER 1935, BUHR 1939, HUBER 1969b). Distribution: Eurosiberian.

Jaapiella vacciniorum (KIEFFER, 1913)

Dichelomyia vaccinii RÜBSAAMEN, 1895

Red larvae develop among deformed leaves at the shoot tips of *Vaccinium myrtillus* L. (Ericaceae). Occurrence: very frequent (RÜBSAAMEN 1895d, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-2925, BUHR 1930, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, NIESSEN 1937, SCHRÖPPEL 1984). Distribution: European.

Jaapiella veronicae (VALLOT, 1827)

Several orange coloured larvae develop in galls on growing top of *Veronica chamaedrys* L. (Scrophulariaceae). The two terminal leaves are shell-like thickened, densely covered with white hair, pressed together, forming a cavity in which the larvae live and pupate in white cocoons. Several overlapping generations develop per year. Larvae hibernate in the soil where they pupate in the spring. Occurrence: extremely frequent (BEUTHIN 1887, RÜBSAAMEN 1890a, HIERONYMUS 1890, SCHRÖDER 1896, BRAUN 1903, SACK 1907, KRÖBER 1910, ROSS 1916, 1922d, HEDICKE 1917a, JAAP 1918, 1923, 1924-1925, 1928, TOEPFER 1918, BUHR 1929, 1939, MARESQUELLE 1931, BENICK 1932, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, ZELLER 1940, 1941, 1942, WEIDNER & WEIDNER 1951, STELTER 1954, KÜHLHORN 1957, BROMM 1964, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, DREWECK 1980, SCHRÖPPEL 1984, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, PICHINOT & MEYER 1998, OSCHMANN 2000, LEHMANN 2007, LEHMANN & FLÜGEL 2012, KRUSE 2009, KWAST 2012, STAUDT 2013). Distribution: European.

Jaapiella volvens RÜBSAAMEN, 1917

Yellow or reddish larvae live in rolled, but not swollen, leaflets of *Lathyrus pratensis* L. (Fabaceae). Type locality: Triglitz/Prignitz. Occurrence: very frequent (RÜBSAAMEN 1917, HEDICKE 1917-1918, JAAP 1918, 1923, 1924-1925, 1928, ROSS 1922c, BUHR 1929, SCHLEICHER 1935, NIESSEN 1938, WEIDNER & WEIDNER 1951, OSCHMANN 2000). Distribution: Eurosiberian.

Janetia cerris (KOLLAR, 1850)

Orange-red larvae cause small galls on leaves of *Quercus cerris* L. (Fagaceae). The gall is conical on the upper leaf side and disc-shaped, densely haired, on the lower side. Only one larva develops in a gall. Occurrence: very rare (MÖHN 1955a mentioned „Sammlung Rübsaamen, Zool. Museum Berlin"; without locality and name of the collector). Distribution: European, Submediterranean.

Janetia nervicola (KIEFFER, 1909)

White larvae cause swellings of middle or lateral veins on the leaves of *Quercus cerris* L. (Fagaceae). Galls were found on trees grown in botanical gardens. Occurrence: frequent. (HAASE 1962, BUHR 1966, KWAST 2012, BUHR H.J. 2013). Distribution: Mediterranean.

Janetia panteli (KIEFFER, 1909)

Kiefferiola panteli (KIEFFER, 1909)

Larvae live between irregularly folded very young leaves of *Quercus robur* L. (Fagaceae). Occurrence: frequent (HAASE & UTECH 1971, PFÜTZENREITER & WEIDNER 1958, BUHR H.J. 2013). Distribution: European.

Janetiella fallax KIEFFER, 1904

Larvae develop in swelling on the stem of *Alyssum arenarium* LOISEL. (Brassicaceae). The gall is 10-15 mm long and 6-8 mm broad. Type locality: Bad Kreuznach. Occurrence: very rare (GEISENHEYNER 1902, KIEFFER 1904). Distribution: European.

Janetiella lemeei (KIEFFER, 1904)

Solitary yellow larvae produce galls on the leaves of *Ulmus minor* MILL. and *U. glabra* HUDS. (Ulmaceae). The galls are small rounded swellings on the veins on one side of the leaves. Short tubulars or cylindrical outgrowths are on the other side of the leaves. Only one generation develops per year. Larvae hibernate in the soil. Occurrence: frequent (HEDICKE 1917-1918, JAAP 1919-1920, 1924-1925, ROSS 1922c, LANGE 1936, BUHR 1939, 1966, WEIDNER & WEIDNER 1951, MÖHN 1955a, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European, up to Turkey.

Janetiella thymi (KIEFFER, 1888)

Yellow-red larvae develop in small, smooth galls at the shoot tips of *Thymus serpyllum* L. and *T. pulegioides* L. (Lamiaceae). Two generations develop per year. Larvae pupate and hibernate in the soil. Occurrence: frequent (V. SCHLECHTENDAL 1882, KIEFFER 1888a, SACK 1907, JAAP 1919-1920, ROSS 1922c, SCHLEICHER 1935, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1984, STELTER 1988a). Distribution: Eurosiberian.

Janetiella tuberculi (RÜBSAAMEN, 1889)

First orange-red, later yellow larvae cause small bumped swellings, 2 mm large, on stems near the tip of *Cytisus scoparius* (L.) LINK (Fabaceae). Only one larva in each gall. Occurrence: frequent (RÜBSAAMEN 1889c, ROSS 1916, JAAP 1918, LUDWIG 1935, SCHLEICHER 1935, BUHR 1939). Distribution: European, Subatlantic.

Kaltenbachiola strobi (WINNERTZ, 1853)

Solitary orange larvae develop in slight swellings on the inner side of the cone scales of *Picea abies* (L.) KARSTEN (Pinaceae) in one generation per year. In spring, larvae pupate in white cocoons. The occurrence of galls of *K. strobi* on scales in cones of *Pinus sylvestris* L. and *P. strobus* L. given in BUHR (1965: #4855) is a mistake (SKUHRAVÁ et al. 2006: 37). Occurrence: frequent (WINNERTZ 1853, SACK 1907, KIEFFER 1920, HOLSTE 1921, 1922, JAAP 1924-1925, MÖHN 1955a, BROMM 1964, OSCHMANN 2000). Distribution: European.

Karshomyia caulicola (COQUILLETT, 1895)

COQUILLETT (1895) obtained adults from larvae developing in stems of *Papaver nudicaule* L. (Papaveraceae). Occurrence: rare (MEYER 1984). Distribution: Holarctic.

Karshomyia marikovskii (MAMAEV, 1961)

Biology unknown. Adults were caught in nature. Occurrence: very rare (MEYER 1984). Distribution: European.

Kiefferia pericarpiicola (BREMI, 1847)

Cecidomyia pimpinellae LOEW, 1850; *Asphondylia pimpinellae* F. LÖW, 1874; *Asphondylia umbellatarum* F. LÖW, 1877

Red larvae develop inside swollen fruits of *Pimpinella saxifraga* L., *P. major* (L.) HUDS., *Daucus carota* L., *Silaum silaus* (L.) SCHINZ & THELL. and some other species and genera of Apiaceae. Only one generation develops per year. Larvae hibernate in the soil. No seed is formed as a result of infestation. Occurrence: extremely frequent (HIERONYMUS 1890, BRAUN 1903, ROSS 1916, JAAP 1918, 1919-1920, 1924-1925, TOEPFER 1918, BUHR 1929, 1930, 1939, LUDWIG 1935, 1974, BERGER 1936, LANGE 1936, ZELLER 1940, WEIDNER 1950, 1962, WEIDNER & WEIDNER 1951, STELTER 1954, MÖHN 1955a, KÜHLHORN 1957, BECH & NOLTE

1964, BUHR 1966, HUBER 1969b, 1974, HAASE & UTECH 1971, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992b, PICHINOT & MEYER 1998, OSCHMANN 2000, LEHMANN 2007, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Lasioptera artemisiae DOMBROVSKAJA, 1940

Orange coloured larvae live gregariously in large swellings on the stem of *Artemisia vulgaris* L. (Asteraceae). The galls are up to 20 mm long. Only one generation develops per year. Occurrence: rare (SKUHRAVÁ 2004: Spremberg, Brandenburg, galls, leg. E. KWAST, 1999, BUHR H.J. 2013). Distribution: Eurosiberian.

Lasioptera arundinis SCHINER, 1854

Whitish larvae live gregariously in swollen lateral shoots of *Phragmites australis* (CAV.) TRIN. (Poaceae). This species attacks shoots developing after the destruction of the growing tip of common reed by other invertebrates (SKUHRAVÁ & SKUHRAVÝ 1981). Only one generation develops per year. Larvae hibernate and pupate in the gall. Occurrence: frequent (KRÖBER 1910, SCHLEICHER 1935, GRABO 1991, TSCHARNTKE 1998, 1999, KRUSE 2009, KWAST 2012). Distribution: European.

Lasioptera auricincta LOEW, 1850

Lasioptera auricincta WINNERTZ, 1853

LOEW (1850) gave the name and very short description of this species with the note „WINN. in litt.". WINNERTZ (1853) described this species in detail. He found red larvae living on roots of *Festuca pratensis* HUDSON (Poaceae). Occurrence: rare (WINNERTZ 1853, SACK 1907). Distribution: European.

Lasioptera berberina (SCHRANK, 1781)

Larvae cause multilocular red swelling on the side of a branch *Berberis vulgaris* L. (Berberidaceae). Occurrence: very rare (mentioned by RUDOW 1875a). Distribution: European.

Lasioptera buhri MÖHN, 1968

Orange-yellow larvae develop gregariously in the black mass of mycelium inside stems of host plant species belonging to various plant families. Females search for damaged stems for lying eggs. MÖHN (1968) gave the following host plants: *Crepis biennis* L., *Hieracium murorum* L., *Lapsana communis* L., *Mycelis muralis* (L.) DUM., *Picris hieracioides* L., *Tragopogon pratensis* L. (Asteraceae); *Melilotus officinalis* (L.) PALL. (Fabaceae); *Campanula trachelium* L. (Campanulaceae). Occurrence: very rare (MÖHN 1966-1971). Distribution: European.

Lasioptera calamagrostidis RÜBSAAMEN, 1893

Lasioptera graminicola KIEFFER, 1898

Orange coloured larvae live under the leaf sheaths of *Calamagrostis epigeios* (L.) ROTH and other species of Poaceae. Type locality: Berlin. Occurrence: frequent (RÜBSAAMEN, 1893, HEDICKE 1917-1918, MÖHN 1955a, 1966-1971, BUHR 1966, HAASE & UTECH 1971, GREILER 1994 (reared adults from *Dactylis glomerata* L.), TSCHARNTKE 1998, KWAST 2012). Distribution: European.

Lasioptera carophila F. LÖW, 1874

Solitary orange larvae cause swellings at the point of insertions of umbellules in inflorescences of many species and genera of Apiaceae. Two generations develop per year. Larvae hibernate and pupate in the galls. Occurrence: extremely frequent (HIERONYMUS 1890, V. SCHLECHTENDAL 1891, GEISENHEYNER 1913, ROSS 1914, 1916, 1922c, JAAP 1918, LUDWIG 1935, SCHLEICHER 1935, STELTER 1954, 1978b, MÖHN 1955a, BUHR 1966, WEIDNER & WEIDNER 1951, UTECH 1988a, 1988b, PICHINOT & MEYER 1998, OSCHMANN 2000, STAUDT 2013). Distribution: European, North African.

Lasioptera cerasiphera STELTER 1990

Larvae develop in fruits of *Prunus cerasus* L. (Rosaceae) which were damaged by the puncture holes of weevils *Anthonomus rectirostris* (L., 1758) (Coleoptera: Curculionidae). Type locality: Kleinmachnow near Berlin. Occurrence: very rare (GOTTWALD 1989, STELTER 1990a). Distribution: European.

Lasioptera eryngii (VALLOT, 1829)

Orange coloured larvae cause plurilocular swellings of stems and leaf petioles of *Eryngium campestre* L. (Apiaceae). Two generations develop per year. Larvae hibernate and pupate in the galls. Occurrence: intermediate (SACK 1907, MÖHN 1966-1971). Distribution: European, Submediterranean.

Lasioptera flexuosa (WINNERTZ, 1853)

Microlasioptera flexuosa (WINNERTZ, 1853); *Lasioptera flexuosa* (WINNERTZ, 1853): DORCHIN & FREIDBERG, 2011

Pink larvae develop in terminal part of unflowering stems of *Phragmites australis* (CAV.) TRIN. (Poaceae). One generation develops per year. Larvae hibernate and pupate in the stems (SKUHRAVÁ & SKUHRAVÝ 1981). Occurrence: rare (WINNERTZ 1853, FRÖMEL 1980, TSCHARNTKE 1998, 1999). Distribution: European.

Lasioptera francoisi (KIEFFER, 1902)

Yellow larvae cause flat spindle-shaped swellings on midribs and leaflets of *Achillea millefolium* L. (Asteraceae). Occurrence: intermediate (LANGE 1936, BUHR 1960, MÖHN 1966-1971). Distribution: European.

Lasioptera hungarica MÖHN, 1968

Lasioptera massa ERDÖS, 1957: nomen nudum; *Lasioptera erdösi* MÖHN, 1968

Orange larvae develop in black mass of mycelium inside internodes of undamaged stems of *Phragmites australis* (CAV.) TRIN. (Poaceae). Only one generation develops per year. Larvae hibernate and pupate in the stems. Occurrence: rare (FRÖMEL 1980, SKUHRAVÁ & SKUHRAVÝ 1981, TSCHARNTKE 1998, 1999). Distribution: European, immigrant to North America (GAGNÉ 2004, GAGNÉ & JASCHHOF 2014).

Lasioptera melampyri MÖHN, 1968

Orange-yellow larvae develop inside stem of *Melampyrum arvense* L. (Scrophulariaceae). Type locality: Mühlhausen (Thuringia). Occurrence: very rare (MÖHN 1966-1971). Distribution: European.

Lasioptera moliniae MÖHN, 1968

Orange-yellow larvae develop inside slightly swollen stem of *Molinia caeurulea* (L.) MOENCH (Poaceae). Type locality: Plötzensee (Berlin). Occurrence: very rare (MÖHN 1966-1971). Distribution: European.

Lasioptera populnea WACHTL, 1883

Orange larvae live as inquilines in galls of the gall midge *Contarinia populi* (RÜBS.) on leaves of *Populus tremula* L. (Salicaceae). Occurrence: very frequent (ROSS 1916, HEDICKE 1917-1918, BUHR 1929, LANGE 1936, WEIDNER & WEIDNER 1951, MÖHN 1966-1971, HUBER 1969b, OSCHMANN 2000, KRUSE 2009, STAUDT 2013). Distribution: Eurosiberian.

Lasioptera rubi (SCHRANK, 1803)

Lasioptera albipennis MEIGEN, 1804; *Lasioptera argyrosticta* MEIGEN, 1830

Orange larvae develop gregariously in hard woody swellings on stems of *Rubus idaeus* L., *R. caesius* L. and other species of *Rubus* (Rosaceae). One generation develops per year. Pupation takes place in the gall. It is a minor but widespread pest of *Rubus* spp. (DARVAS et al. 2000). Occurrence: extremely frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, KRÖBER 1910, KÜSTER 1910, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1923, 1924-1925, 1928, BUHR 1929, 1939, MARESQUELLE 1931, SCHLEICHER 1935, LUDWIG 1935, BERGER

1936, LANGE 1936, ZELLER 1941,1942, WEIDNER 1950, 1962, WEIDNER & WEIDNER 1951, MÖHN 1955a, 1966-1971, KÜHLHORN 1957, BROMM 1964, BUHR 1966, HAASE & UTECH 1971, DREWECK 1980, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, PICHINOT & MEYER 1998, OSCHMANN 2000, BUHR H.J. 2005, LEHMANN & FLÜGEL 2012, KRUSE 2009, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Lasioptera ruebsaameni MÖHN, 1968

Orange-yellow larvae live freely inside stems of *Sonchus* sp. (Asteraceae). Type locality: Rhineland. Occurrence: very rare (MÖHN 1966-1971). Distribution: European.

Lasioptera stelteri MÖHN, 1968

Orange-yellow larvae live gregariously inside stems of *Heracleum sphondylium* L. (Apiaceae). Type locality: Dauborn, Taunus. Occurrence: very rare (MÖHN 1966-1971). Distribution: European.

Lasioptera thuringica MÖHN, 1968

Pale red larvae live as inquilines in small fruit galls of the gall midge *Kiefferia pericarpiicola* (BREMI) on *Pimpinella major* (L.) HUDS. (Apiaceae). Type locality: Mühlhausen (Thuringia). Occurrence: very rare (MÖHN 1966-1971). Distribution: European.

Lasioptera tiliarum MAMAEVA, 1964

Pale red larvae live as inquilines in galls of the gall midge *Contarinia tiliarum* (KIEFFER) on *Tilia* spp. (Tiliaceae). Occurrence: very rare (MÖHN 1966-1971). Distribution: European.

Lathyromyza florum RÜBSAAMEN, 1915

Red larvae live in deformed flower buds of *Lythyrus sylvestris* L. (Fabaceae). Occurrence: intermediate (JAAP 1924-1925, MÖHN 1955a, MEYER 1984). Distribution: Eurosiberian.

Lathyromyza schlechtendali (KIEFFER, 1886)

White larvae live gregariously in rolled not swollen leaves of *Lathyrus linifolius* REICH. (BÄSSL.) (Fabaceae). Occurrence: frequent (RÜBSAAMEN 1915, JAAP 1924-1925, LUDWIG 1935, SCHLEICHER 1935, NIESSEN 1937, ZELLER 1942, BUHR 1960, 1966, OSCHMANN 2000). Distribution: Eurosiberian.

Lestodiplosis arcuata (WINNERTZ, 1953)

Larvae develop in flower heads of various species of the family Asteraceae, also in rotten wood and mushroom inhabited by other larvae of Diptera. Occurrence: rare (WINNERTZ 1853, SACK 1907, HEYNEN 1990). Distribution: European.

Lestodiplosis callida (WINNERTZ, 1953)

Larvae are predators of the gall midge *Dasineura papaveris* WINNERTZ developing in capsules of *Papaver rhoeas* L. and *P. dubium* L. (Papaveraceae). Occurrence: very rare (WINNERTZ 1853). Distribution: European.

Lestodiplosis casta (MÖHN, 1955)

Phonodiplosis casta MÖHN, 1955

Larvae are predators on larvae of *Parepidosis* sp. (Diptera: Cecidomyiidae: Porricondylinae). Type locality: Dauborn, Taunus. Occurrence: very rare (MÖHN 1955a, 1955d). Distribution: European.

Lestodiplosis centralis (WINNERTZ, 1953)

Biology unknown. Occurrence: very rare (WINNERTZ 1853). Distribution: European.

Lestodiplosis coni (KIEFFER, 1920)

Red larvae develop under the scales in the cones of *Picea abies* (L.) KARSTEN (Pinaceae). Type locality: Munich. Occurrence: very rare (KIEFFER 1920). Distribution: European.

Lestodiplosis cryphali (KIEFFER, 1894)

Larvae live in the corridors formed by the bark beetle *Ernoporicus fagi* (F., 1798) (Coleoptera: Scolytidae) on *Fagus sylvatica* L. Occurrence: very rare (WICHMANN 1958). Distribution: European.

Lestodiplosis fuscipennis (WINNERTZ, 1853)

Zoophagous larvae live in rotten wood inhabited by larvae of other Diptera. Occurrence: intermediate (WINNERTZ 1853, SACK 1907, KRÖBER 1910, SCHLEICHER 1935). Distribution: European.

Lestodiplosis flaveolata (WINNERTZ, 1953)

Biology unknown. Occurrence: very rare (WINNERTZ 1853). Distribution: European.

Lestodiplosis holstei KIEFFER, 1920

Red larvae live under the scales in cones of *Picea abies* (L.) KARSTEN (Pinaceae) and feed on larvae of the gall midge *Kaltenbachiola strobi* WINNERTZ. Type locality: Munich. Occurrence: very rare (KIEFFER 1920). Distribution: European.

Lestodiplosis longifilis (KIEFFER, 1901)

Red larvae are predators of the gall midge *Camptodiplosis boleti* (KIEFFER) developing in various mushrooms. Occurrence: very rare (SKUHRAVÁ in WEBER 1995). Distribution: European.

Lestodiplosis maculata (WINNERTZ, 1953)

Biology unknown. Occurrence: very rare (WINNERTZ 1853). Distribution: European.

Lestodiplosis morchellae RÜBSAAMEN, 1911

Adults were reared from dry mushroom *Morchella esculenta* (L.) PERS. (Morchellaceae) which were inhabited by larvae of butterflies and other insects. Type locality: Berlin (delicatessen shop). Occurrence: very rare (RÜBSAAMEN 1911). Distribution: European.

Lestodiplosis necans (RÜBSAAMEN, 1891)

Larvae are predators of gall midge larvae developing in galls of the gall wasp *Andricus foecundatrix* (HARTIG, 1840) (Hymenoptera: Cynipidae) on *Quercus petraea* (MATT.) LIEBL. and *Q. robur* L. (Fagaceae). Occurrence: very rare (RÜBSAAMEN 1891b). Distribution: European.

Lestodiplosis parricida RÜBSAAMEN, 1906

Larvae are predators of the larvae of the gall midge *Clinodiplosis cilicrus* (KIEFFER) living in rotten bunches of *Vitis vinifera* L. (Vitaceae). Occurrence: very rare (RÜBSAAMEN 1906). Distribution: European.

Lestodiplosis plicatricis BARNES, 1928

Larvae develop together with the gall midge *Dasineura plicatrix* (LOEW) on *Rubus* sp. (Rosaceae). Occurrence: very rare (HINTZE-PODUFAL 1995). Distribution: European.

Lestodiplosis polypori (LOEW, 1850)

Cecidomyia polypori WINNERTZ, 1853

Larvae are zoophagous and live in various species of the genus *Polyporus* (Polyporaceae, Fungi) inhabited by larvae of Coleoptera and Diptera. Occurrence: intermediate (WINNERTZ 1853, SACK 1907). Distribution: European.

Lestodiplosis pulchella (WINNERTZ, 1853)

Zoophagous larvae live in rotten wood of *Fagus sylvatica* L. (Fagaceae) inhabited by larvae of Diptera. Occurrence: rare (WINNERTZ 1853, SACK 1907). Distribution: European.

Lestodiplosis raphani BARNES, 1929

Larvae are predators of mites *Acarus siro* L., 1758 and *Aleurobius* sp. (Acarina) in stored seed. Occurrence: very rare (NIJVELDT 1969). Distribution: European.

Lestodiplosis tarsonemi RÜBSAAMEN, 1895

Red larvae are predators of eriophyid mites *Steneotarsonemus phragmitidis* (V. SCHLECHTENDAL, 1898) (Acari: Tarsonemidae) in galls on *Phragmites australis* (CAV.) TRIN. (Poaceae). Occurrence: very rare (RÜBSAAMEN 1895c). Distribution: European.

Lestodiplosis tibialis (WINNERTZ, 1953)

WINNERTZ (1853) obtained the male from a dry gall at the tip of *Salix alba* L. (Salicaceae) inhabited by gall midge larvae probably *Rabdophaga terminalis* (LOEW) (Salicaceae). Occurrence: very rare (WINNERTZ 1853). Distribution: European.

Lestodiplosis trivittata RÜBSAAMEN, 1921

Red larvae develop on trunk of *Fagus sylvatica* L. (Fagaceae). Type locality: Kiel. Occurrence: very rare (RÜBSAAMEN 1921, SCHLEICHER 1935). Distribution: European.

Lestodiplosis variegata (MACQUART, 1826)

Biology unknown. Occurrence: very rare (MEIGEN 1838). Distribution: European.

Lestodiplosis vasta (MÖHN, 1955)

Chiliodiplosis vasta MÖHN, 1955

Larvae are predators of millipedes *Polyxenus lagurus* (L., 1758) (Diplopoda: Polyxenidae). Type locality: Mainz-Gonzenheim. Occurrence: very rare (MÖHN 1955a, 1955d). Distribution: European.

Lestodiplosis vorax (RÜBSAAMEN, 1891)

Larvae are predators of other gall midge larvae. Type locality: Siegen. Occurrence: intermediate (RÜBSAAMEN 1891b, MÖHN 1955a). Distribution: European.

Lestodiplosis xylodiplosuga SKUHRAVÁ, 2001

Larvae attack and suck on the gall midge larvae *Xylodiplosis* sp. which develop in young xylem vessels of freshly cut trees. Biology was studied in detail by DENGLER (2006). Occurrence: very rare (SKUHRAVÁ & DENGLER 2001). Distribution: European.

Loewiola centaureae (F. LÖW, 1875)

Yellow larvae cause blister-like galls on leaves of *Centaurea scabiosa* L., *C. jacea* L. and other *Centaurea* species (Asteraceae). Galls are situated on the midrib or side vein and are surroundded with yellow or purple margin. Two or three generations develop per year. Larvae pupate and hibernate in the soil. Occurrence: very frequent (SACK 1907, ROSS 1916, 1922c, JAAP 1919-1920, 1924-1925, 1928, BUHR 1929, 1966, LUDWIG 1935, 1974, SCHLEICHER 1935, NIESSEN 1937, MÖHN 1955a, WEIDNER & WEIDNER 1951, BROMM 1964, HUBER 1969b, SCHRÖPPEL 1981, UTECH 1988a, 1988b, PICHINOT & MEYER 1998, OSCHMANN 2000, STAUDT 2013). Distribution: European.

Macrodiplosis pustularis (BREMI, 1847) (Fig. 3B)

Diplosis dryobia F. LÖW, 1877

First white, later red-yellow larvae cause galls on leaf margins of *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). The marginal leaf lobe is a little thickened and folded downwards forming a cavity for development of larvae. Only one generation develops per year. Larvae leave the galls, hibernate in the soil where they pupate in the spring of the next year. Occurrence: extremely frequent (RÜBSAAMEN 1890a, ROSS 1916, 1922d, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, BUHR 1929, MARESQUELLE 1931, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, ZELLER 1940, 1941, WEIDNER 1950, WEIDNER & WEIDNER 1951, MÖHN 1955a, PFÜTZENREITER & WEIDNER 1958, BROMM 1964, BUHR 1966, HAASE & UTECH 1971, ESCHELMÜLLER & KLEMENT 1974, HUBER 1974, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, DREWECK 1980, SCHRÖPPEL 1983, SKUHRAVÁ & SKUHRAVÝ 1988, PICHINOT & MEYER 1998, OSCHMANN 2000, BUHR H.J. 2005, LEHMANN 2007, KRUSE 2009, KWAST 2012, STAUDT 2013). Distribution: European, up to Kazakhstan.

Macrodiplosis roboris (HARDY, 1854)

Macrodiplosis volvens KIEFFER, 1895

First whitish, later orange-yellow larvae cause galls on leaf margins of *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). The part of the leaf between two lobes is rolled

upwards forming inside a chamber for development of larvae. Only one generation develops per year. Larvae leave the galls; hibernate in the soil where they pupate in the spring of the next year. Occurrence: extremely frequent (References: HIERONYMUS 1890, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, BUHR 1929, MARESQUELLE 1931, SCHLEICHER 1935, LUDWIG 1935, LANGE 1936, WEIDNER 1950, 1962, WEIDNER & WEIDNER 1951, PFÜTZENREITER & WEIDNER 1958, BROMM 1964, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, ESCHELMÜLLER & KLEMENT 1974, KLEMENT & ESCHELMÜLLER 1978, DREWECK 1980, SCHRÖPPEL 1981, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, PICHINOT & MEYER 1998, OSCHMANN 2000, KRUSE 2009, KWAST 2012, STAUDT 2013). Distribution: European, including Kazakhstan.

Macrolabis achilleae RÜBSAAMEN, 1893

Yellow larvae develop in flower heads of *Achillea millefolium* L. (Asteraceae). Occurrence: frequent (RÜBSAAMEN 1893, MEYER 1984, STELTER 1989e). Distribution: European.

Macrolabis alnicola RÜBSAAMEN, 1914

Red-yellow larvae live as inquilines in leaf galls caused by the gall midge *Dasineura tortilis* (BREMI) on *Alnus glutinosa* (L.) GAERTN. and *A. incana* (L.) MOENCH (Betulaceae). Type locality: Remagen. Occurrence: intermediate (RÜBSAAMEN 1914). Distribution: European.

Macrolabis aquilegiae (KIEFFER, 1909)

Red larvae develop in swollen flower buds of *Aquilegia vulgaris* L. (Ranunculaceae). Occurrence: very rare (KWAST 2012). Distribution: European.

Macrolabis bedeguariformis (RUDOW, 1875)

Yellow-white larvae live in large bud galls on *Populus tremula* L. (Salicaceae). The bud is changed into mass which is similar to „bedeguar" on rose, inside is a chamber with larvae. Occurrence: galls found only by RUDOW (1875a, 1875b). Distribution: European.

Macrolabis brunellae TAVARES, 1907

Macrolabis brunellae RÜBSAAMEN, 1921; *Macrolabis ruebsaameni* HEDICKE, 1938

Solitary slightly yellow larvae develop between deformed leaves at the shoot tips of *Prunella grandiflora* (L.) SCHOLLER and *P. vulgaris* L. (Lamiaceae). Occurrence: frequent (JAAP 1919-1920, 1923, 1924-1925, RÜBSAAMEN 1921, ROSS 1922c, BUHR 1939, 1966, STELTER 1954, HUBER 1969b, SCHRÖPPEL 1983, OSCHMANN 2000). Distribution: European.

Macrolabis buhri STELTER, 1956

White to yellowish larvae cause leaf bud galls at vegetative tips of *Stellaria nemorum* L. (Caryophyllaceae). Type locality: Groß Lüsewitz. Occurrence: rare (STELTER 1956, BUHR 1966). Distribution: European.

Macrolabis cirsii (RÜBSAAMEN, 1890)

Yellow larvae develop in flower heads of *Cirsium arvense* (L.) SCOP. and other *C.* spp. (Asteraceae). Type locality: Charlottenthal, Siegen. Occurrence: rare (RÜBSAAMEN 1890a). Distribution: European.

Macrolabis dulcamarae (RÜBSAAMEN, 1891)

Orange-yellow larvae live as inquilines in flower bud galls caused by the gall midge *Contarinia solani* (Rübs.) on *Solanum dulcamara* L. (Solanaceae). Occurrence: very rare (RÜBSAAMEN 1890a). Distribution: European.

Macrolabis fagicola (BARNES, 1939)

Dasyneura fagicola BARNES, 1939; *Schueziella fagicola* (BARNES, 1939): MÖHN 1961

Larvae live as inquilines in galls of the gall midge *Contarinia fagi* RÜBS. on *Fagus sylvatica* L. (Fagaceae). Type locality: Schleswig-Holstein. Occurrence: frequent (BARNES 1939a, MÖHN 1961b, STELTER 1994c). Distribution: European.

Macrolabis floricola (RUDOW, 1875)

Larvae live as inquilines in galls of the gall midge *Contarinia tiliarum* (KIEFFER) on *Tilia cordata* MILL. and *T. platyphyllos* SCOP. (Tiliaceae). Occurrence: rare (RUDOW 1875b). Distribution: European.

Macrolabis heraclei (KALTENBACH, 1862)

Cecidomyia corrugans F. LÖW, 1877

White larvae live gregariously in crinkled, remaining folded and unopened leaves of *Heracleum sphondylium* L. (Apiaceae). Two generations develop per year. Larvae pupate and hibernate in the soil. Occurrence: very frequent (KALTENBACH 1874, RÜBSAAMEN 1890a, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, ROSS 1922c, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, ZELLER 1940, 1941, WEIDNER & WEIDNER 1951, STELTER 1954, 1962c, 1975b MÖHN 1955a, HUBER 1969b, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000). Distribution: Eurosiberian.

Macrolabis hieracii RÜBSAAMEN, 1917

First yellow, later reddish larvae develop in galls at the shoot tips of *Hieracium murorum* L. and related species (Asteraceae). Type locality: Triglitz/Prignitz. Two generations develop per year. Larvae pupate in the soil. Occurrence: very frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, JAAP 1918, 1924-1925, 1928, SCHLEICHER 1935, BUHR 1939, 1966, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a). Distribution: European.

Macrolabis hippocrepidis KIEFFER, 1898

Larvae live gregariously in folded and swollen leaflets of *Hippocrepis comosa* L. (Fabaceae). RÜBSAAMEN (1915) considered the larvae of the gall midge *Dasineura comosae* RÜBS. to be gall-causer and larvae of *M. hippocrepidis* KIEFFER to be inquilines. Occurrence: intermediate (RÜBSAAMEN 1915, JAAP 1919-1920, 1925, ROSS 1922c, HUBER 1969b). Distribution: Southeuropean.

Macrolabis holosteae RÜBSAAMEN, 1917

Whitish-yellow larvae live in galls formed of a terminal pair of leaves on stem tips of *Stellaria holostea* L. (Caryophyllaceae). Type locality: Reinbeck. Occurrence: frequent (RÜBSAAMEN 1917, JAAP 1918, 1928, BUHR 1930, 1966, SCHLEICHER 1935, STELTER 1956, HUBER 1969b). Distribution: European.

Macrolabis incognita STELTER, 1975

White larvae develop in rolled leaflet margins of *Peucedanum oreoselinum* (L.) MOENCH (Apiaceae). Type locality: Bocksberg in NSG Kösterbeck (Rostock). Occurrence: very rare (STELTER 1975b). Distribution: European.

Macrolabis incolens RÜBSAAMEN, 1895

Whitish-yellow larvae live as inquilines in the gall of the gall midge *Jaapiella veronicae* (VALLOT) on *Veronica chamaedrys* L. (Scrophulariaceae). Occurrence: intermediate (RÜBSAAMEN 1895c, PICHINOT & MEYER 1998). Distribution: European.

Macrolabis jaapi RÜBSAAMEN, 1915

Whitish larvae live in galls at the stem tip of *Galium aparine* L. (Rubiaceae). It is not quite clear if they are gall causers or inquilines. Type locality: Jena. Occurrence: frequent (RÜBSAAMEN 1915, JAAP 1918, 1924-1925, 1928, ROSS 1922d, BUHR 1929, SCHLEICHER 1935, HAASE & UTECH 1971, STELTER 1994b, OSCHMANN 2000). Distribution: European.

Macrolabis lamii RÜBSAAMEN, 1915

Whitish larvae live in leaf galls at stem tips of *Lamium album* L. (Lamiaceae). Occurrence: very frequent (HEDICKE 1917-1918, JAAP 1918, 1923, 1924-1925, ROSS 1922c, BUHR 1929, LUDWIG 1935, SCHLEICHER 1935, HUBER 1969b, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, OSCHMANN 2000). Distribution: European.

Macrolabis laserpitii RÜBSAAMEN, 1917

White larvae cause malformation of inflorescences of *Laserpitium latifolium* L. (Apiaceae). Type locality: Martinroda (Thuringia). Occurrence: rare (RÜBSAAMEN 1917, JAAP 1919-1920, 1924-1925, OSCHMANN 2000). Distribution: European.

Macrolabis lonicerae RÜBSAAMEN, 1912

White or yellowish-white larvae produce galls in the form of rolled leaf margins on *Lonicera periclymenum* L. (Caprifoliaceae). Type locality: Remagen. Occurrence: frequent (RÜBSAAMEN 1912, ROSS 1922c, BUHR 1929, SCHLEICHER 1935, PICHINOT & MEYER 1998). Distribution: European.

Macrolabis luceti KIEFFER, 1899

White larvae are inquilines in leaf galls of the gall midge *Dasineura rosae* (HARDY) on *Rosa canina* L. and related species (Rosaceae). Occurrence: intermediate (RÜBSAAMEN 1915). Distribution: European.

Macrolabis lutea RÜBSAAMEN, 1914

White larvae live in leaf galls on *Euphorbia cyparissias* L. (Euphorbiaceae) that are similar to galls of the gall midge *Spurgia euphorbiae* (VALLOT), probably as inquilines. Occurrence: intermediate (RÜBSAAMEN 1914, JAAP 1918, SCHLEICHER 1935). Distribution: European.

Macrolabis mali ANFORA, 2005

Larvae are inquilines in leaf galls of the gall midge *Dasineura mali* (KIEFFER) on *Malus domestica* BORKH. (Rosaceae). Occurrence: very rare (ANFORA et al. 2005). Distribution: European.

Macrolabis orobi (F. LÖW, 1877)

Yellow larvae cause galls on *Lathyrus vernus* (L.) BERNH. (Fabaceae). The gall is formed of rolled leaf margins. Occurrence: rare (BUHR 1960, HUBER 1969b, WEIDNER & WEIDNER 1951). Distribution: European.

Macrolabis pavida (WINNERTZ, 1853)

White larvae live as inquilines in leaf galls of the gall midge *Dasineura acrophila* (WINNERTZ) on *Fraxinus excelsior* L. (Oleaceae). Occurrence: frequent (WINNERTZ 1853, PICHINOT & MEYER 1998). Distribution: European.

Macrolabis pilosellae (BINNIE, 1877)

Yellowish larvae develop gregariously in rosette leaf bud gall on *Hieracium pilosella* L. (Asteraceae). Occurrence: very frequent (KIEFFER 1888a, HIERONYMUS 1890, JAAP 1918, 1919-1920, 1928, ROSS 1922c, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, NIESSEN 1937, ZELLER 1941, 1942, MÖHN 1955a, HUBER 1969b, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1992b, OSCHMANN 2000). Distribution: European.

Macrolabis podagrariae (LOEW, 1850)

Macrolabis podagrariae STELTER, 1962

White larvae live gregariously in crinkled, remaining folded and unopened leaves of *Aegopodium podagraria* L. (Apiaceae). Occurrence: frequent (JAAP 1918, BUHR 1939, 1966, STELTER 1962c, BRAUN 1883, SKUHRAVÁ & SKUHRAVÝ 1988, BUHR H.J. 2013). Distribution: European.

Macrolabis pratorum (WINNERTZ, 1853)

Biology unknown. WINNERTZ (1853) caught females on meadows in May and June. Occurrence: rare (WINNERTZ 1853). Distribution: European.

Macrolabis quercicola (STELTER, 1994)

Schueziella quercicola STELTER, 1994

Larvae live as inquilines in leaf bud galls caused by the gall midge *Contarnia quercina* (RÜBS.) on *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). Type locality: Groß Lüsewitz. Occurrence: very rare (STELTER 1994c). Distribution: European.

Macrolabis saliceti (LOEW, 1850)
Cecidomyia saliceti WINNERTZ, 1853
Reddish-yellow larvae live as inquilines in galls of the gall midge *Rabdophaga terminalis* (LOEW) on *Salix fragilis* L. (Salicaceae). Occurrence: very rare. Reference: WINNERTZ 1853. Distribution: European.
Macrolabis stellariae (LIEBEL, 1889)
Bright lemon yellow larvae develop gregariously between thickened leaves of terminal pair on *Stellaria media* (L.) VILL. (Caryophyllaceae). Occurrence: frequent (HEDICKE 1917-1918, JAAP 1918, 1924-1925, BUHR 1929, 1939, LANGE 1936, STELTER 1956, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992b). Distribution: European.
Macrolabis vicicolus STELTER, 1992
Larvae live as inquilines in leaf galls caused by the gall midges *Dasineura loewiana* RÜBS., *D. spadicea* RÜBS. and *D. viciae* (KIEFFER) on *Vicia cracca* L. Type locality: Freienholz (Sanitz). Occurrence: very rare (STELTER 1992a). Distribution: European.
Mamaevia vysineki SKUHRAVÁ, 1967
Biology unknown. Males were reared from soil samples in alfalfa field. Occurrence: rare (MEYER 1984). Distribution: European.
Massalongia bachmaieri MÖHN, 1958
Larvae cause thick-walled galls on leaves of *Betula nana* L. (Betulaceae). Type locality: Bernrieder Filz. Occurrence: very rare (BACHMAIER 1965, MÖHN 1958, HUBER 1969b). Distribution: European.
Massalongia rubra (KIEFFER, 1890)
First white, later red larvae cause swellings on the midrib of the leaves of *Betula pendula* ROTH and *B. pubescens* EHRH. (Betulaceae). Only one generation develops per year. Larvae hibernate and pupate in the soil. Occurrence: very frequent (HIERONYMUS 1890, RÜBSAAMEN 1899c, ROSS 1916, 1922c, JAAP 1918, BUHR 1930, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, NIESSEN 1938, WEIDNER & WEIDNER 1951, STELTER 1954, MÖHN 1955a, HAASE & UTECH 1971, SCHRÖPPEL 1981, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1992a). Distribution: European, occurring up to Kazakhstan.
Mayetiola agrostidis ERTEL, 1975
Mayetiola agrostidis COUTIN, 2000
Larvae live at the stem base of *Agrostis cappillaris* L. and *A. stolonifera* L. (Poaceae). Type locality Dauborn, Taunus. Occurrence: very rare (ERTEL 1975, COUTIN 2000). Distribution: European.
Mayetiola agrostivora MEYER, 1985
Larvae live gregariously in stem galls on *Agrostis stolonifera* L. (Poaceae). Type locality: Speicherbecken Hauke-Haien-Koog near Ockholm. Occurrence: rare (MEYER 1985, PICHINOT & MEYER 1998). Distribution: European.
Mayetiola alopecuri ERTEL, 1975
Yellow larvae develop under leaf sheaths at the stem base of *Alopecurus pratensis* L. (Poaceae). Type locality: Leipzig. Occurrence: rare (ERTEL 1975, STELTER 1992b, GREILER & TSCHARNTKE 1990, GREILER 1994). Distribution: European.
Mayetiola bifida KIEFFER, 1909
Larvae develop in small depressions in the lower stem part on *Calamagrostis canescens* (WEBER) ROTH (Poaceae). Occurrence: very rare (RÜBSAAMEN 1895a). Distribution: European.
Mayetiola bimaculata (RÜBSAAMEN, 1895)
Mayetiola calamagrostidis KIEFFER, 1909; *Mayetiola spinulosa* KIEFFER, 1909

Larvae develop inside stems of *Calamagrostis canescens* (WEBER) ROTH (Poaceae). Occurrence: rare (RÜBSAAMEN 1895c, STELTER 1992b). Distribution: European.

Mayetiola buhri ERTEL, 1975

Larvae develop inside stems of *Melica uniflora* RETZ. (Poaceae). Type locality: Mühlhausen (Thuringia). Occurrence: rare (ERTEL 1975, STELTER 1970b, 1992b). Distribution: European.

Mayetiola culacera STELTER, 1992

White larvae live in stem galls on *Calamagrostis canescens* (WEBER) ROTH (Poaceae). The gall is a depression of 15 mm length surrounded by strong walls. Type locality: Groß Lüsewitz. Occurrence: very rare (STELTER 1992b). Distribution: European.

Mayetiola dactylidis KIEFFER, 1896

White larvae develop in slight swellings at the stem base of *Dactylis glomerata* L. (Poaceae). Occurrence: rare (BROMM 1964, BUHR 1966). Distribution: European.

Mayetiola destructor (SAY, 1817)

Mayetiola secalis BOLLOW, 1955

White larvae cause swellings on the lower part of the stem on *Triticum aestivum* L., *Secale cereale* L., *Hordeum vulgare* L. and occasionally also on various species of weed grasses (Poaceae). There are usually two generations per year. Larvae hibernate in puparia on plants and pupate there in the next spring. It is a minor pest in Europe but the main pest of cereals in North America (SKUHRAVÁ et al.1984a, DARVAS et al. 2000). Occurrence: very frequent (SACK 1907, HEDICKE 1917-1918, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, BOLLOW 1950, 1955a, BUHL 1957a, ERTEL 1975, STELTER 1992b, STELTER et al. 1990, 1991). Distribution: originally Palaearctic; Cosmopolit, wherever wheat is grown.

Mayetiola graminis (FOURCROY, 1785)

Cecidomyia poae BOSC, 1817; *Hormomyia graminicola* WINNERTZ, 1853; *Cecidomyia graminis* BRISCHKE, 1869

White larvae cause swellings on the stem of *Poa nemoralis* L. (Poaceae). The stem is covered with many white rootlets regularly placed along a longitudinal line. Larvae do not have the spatula sternalis on the sternal part of the prothorax. One generation develops per year. Occurrence: extremely frequent (WINNERTZ 1853, RÜBSAAMEN 1889a, HIERONYMUS 1890, THOMAS 1911b, ROSS 1916, JAAP 1919-1920, 1923, 1924-1925, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, MÖHN 1955a, WEIDNER 1950, WEIDNER & WEIDNER 1951, BROMM 1964, BUHR 1966, HUBER 1969b, ESCHELMÜLLER & KLEMENT 1974, ERTEL 1975, DREWECK 1980, SCHRÖPPEL 1983, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, STELTER 1992b, PICHINOT & MEYER 1998, OSCHMANN 2000, LEHMANN 2007, STAUDT 2013). Distribution: European.

Mayetiola hellwigi (RÜBSAAMEN, 1912)

Larvae cause swellings on stems of *Brachypodium sylvaticum* (HUDS.) BEAUV. (Poaceae). Occurrence: frequent (RÜBSAAMEN 1912, HEDICKE 1917-1918, BUHR 1939, 1966, ERTEL 1975, STELTER 1992b). Distribution: European.

Mayetiola holci KIEFFER, 1896

White larvae develop in stem swellings on *Holcus mollis* L. and *Holcus lanatus* L. (Poaceae). Occurrence: rare (MÖHN 1955a, BUHR 1966, ERTEL 1975, STELTER 1992b). Distribution: European.

Mayetiola hordei KIEFFER, 1909

Larvae induce saddle-formed galls under leaf sheaths of *Hordeum vulgare* L. (Poaceae). Occurrence: very rare (ROSS 1911, ROSS & HEDICKE 1927). Distribution: European, North African (GAGNÉ et al. 1991).

Mayetiola joannisi KIEFFER, 1896

White larvae live at the base of the stems of *Poa nemoralis* L. (Poaceae). Occurrence: frequent (WEIDNER & WEIDNER 1951, MÜHLE 1953, ERTEL 1975). Distribution: European.

Mayetiola lanceolatae (RÜBSAAMEN, 1895)

Larvae cause galls on stem tips of *Calamagrostis canescens* (WEBER) ROTH (Poaceae). Occurrence: frequent (RÜBSAAMEN 1895a, 1895c, HEDICKE 1917-1918, LANGE 1936, BUHR 1966, ERTEL 1975, STELTER 1992b). Distribution: European.

Mayetiola moliniae (RÜBSAAMEN, 1895)

White larvae develop in small stem swellings on *Molinia caerulea* (L.) MOENCH (Poaceae). Occurrence: very rare (RÜBSAAMEN 1895a, 1895c, HEDICKE 1917-1918, ERTEL 1975). Distribution: European.

Mayetiola phalaris BARNES, 1928

Larvae live at the base of the stem of *Phalaris arundinacea* L. (Poaceae) and cause the flower-shoot to wilt and produce white ears. Occurrence: very rare (BARNES 1928, BLUNCK 1931, TOMASZEWSKI 1931, STELTER 1992b). Distribution: European.

Mayetiola puccinelliae MEYER, 1984

Whitish larvae live gregariously at the stem basis of *Puccinellia maritima* (HUDS.) PARL. (Poaceae). Type locality: Meldorfer Bucht. Occurrence: rare (MEYER 1984, STELTER 1992b, PICHINOT & MEYER 1998). Distribution: European.

Mayetiola radicifica (RÜBSAAMEN, 1895)

Larvae cause swellings on the stem of *Poa nemoralis* L. (Poaceae). The stem is covered with many rootlets unregularly placed. In contrast to *M. graminis* FOURCROY, larvae of *M. radicifica* (RÜBS.) have a *spatula sternalis* with a characteristic acute anterior part. Type locality: Plötzensee, Berlin. Occurrence: intermediate (RÜBSAAMEN 1895c, HEDICKE 1917-1918, ERTEL 1975, PICHINOT & MEYER 1998). Distribution: European.

Mayetiola schoberi BARNES, 1958

Several larvae live gregariously under the leaf sheaths of *Poa pratensis* L. (Poaceae). Type locality: Ratzeburg. Occurrence: rare (BARNES 1958a, ERTEL 1975, MEYER 1984, PICHINOT & MEYER 1998, STELTER 1992b). Distribution: European.

Mayetiola ventricola (RÜBSAAMEN, 1899)

Pemphigocecis ventricola (RÜBSAAMEN, 1899)

White larvae develop gregariously in large swellings of the stem base on *Molinia caerulea* (L.) MOENCH (Poaceae). Occurrence: frequent (RÜBSAAMEN 1899c, HEDICKE 1917-1918, JAAP 1918, ROSS 1922c, ERTEL 1975, MEYER 1984, STELTER 1992b). Distribution: European.

Mikiola fagi (HARTIG, 1839)

Solitary white larvae produce large, smooth (hairless) hard galls, pointed at the tip, on leaves of *Fagus sylvatica* L. (Fagaceae). Inside the galls is one large chamber. One generation occurs per year. Full-grown larvae shut the opening at the base of the gall by a spinned lid. In autumn the galls separate from leaves and drop to the ground where they remain in the litter up to the spring of the next year. Larvae hibernate inside galls and pupate there. Occasionally it is a serious pest of young trees in submontane and montane zones of Central Europe (SKUHRAVÁ & ROQUES 2000). Occurrence: extremely frequent (BEUTHIN 1887, RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, KRÖBER 1910, ROSS 1916, HEDICKE 1917-1918, ROSS 1922d, JAAP 1918, 1919-1920, 1923, 1924-1925, 1928, TOEPFER 1918, BUHR 1929, 1930, MARESQUELLE 1931, BENICK 1932, SCHLEICHER 1935, LUDWIG 1935, LANGE 1936, NIESSEN 1937, ZELLER 1942, WEIDNER 1950, 1962, WEIDNER & WEIDNER 1951, MÖHN 1955a, KÜHLHORN 1957, BROMM 1964, HUBER 1969b, HAASE & UTECH 1971, ESCHELMÜLLER 1972, ESCHELMÜLLER & KLEMENT 1974, KLEMENT 1977, KLEMENT & ESCHELMÜLLER 1978, SEGEBADE & SCHAEFER 1979, DREWECK 1980, SCHRÖPPEL 1981, UTECH

1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, PICHINOT & MEYER 1998, OSCHMANN 2000, BOGENSCHÜTZ 2006, LEHMANN 2007, KRUSE 2009, KWAST 2012, STAUDT 2013). Distribution: European, occurring up to Caucasus.

Mikomya coryli (KIEFFER, 1901)

Solitary hyaline larvae develop in small circular depressions on the leaf base of *Corylus avellana* L. (Corylaceae) in one generation per year. Larvae hibernate in the soil. Occurrence: intermediate (HEDICKE 1917-1918, BUHR 1966, SKUHRAVÁ & SKUHRAVÝ 1988, KWAST 2012). Distribution: European, occurring up to Turkey.

Monarthropalpus flavus (SCHRANK, 1776)

Cecidomyia buxi LABOULBÉNE, 1873

Solitary yellow-green larvae develop in blister leaf galls on *Buxus sempervirens* L. (Buxaceae). As a result of the larval feeding on leaf tissue, the leaves drop off prematurely. One generation develops per year. Larvae hibernate in galls where they pupate in the spring. *M. flavus* (SCHRANK) is sometimes a serious pest of ornamental boxwood shrubs in parks and gardens. Occurrence: frequent (SCHRANK 1776, HIERONYMUS 1890, KRÖBER 1910, BUHR 1939, SCHLEICHER 1935, LANGE 1936). Distribution: European, including Turkey, immigrant to USA: California.

Monobremia subterranea (KIEFFER, 1898)

Larvae prey on aphids developing on roots of *Tanacetum vulgare* L. (Asteraceae). Occurrence: rare (MÖHN 1955a). Distribution: European.

Monodiplosis liebeli (KIEFFER, 1889)

Schizomyia sociabilis RÜBSAAMEN, 1889

Pale orange coloured larvae live as inquilines in leaf galls caused by the gall midges *Macrodiplosis pustularis* (BREMI) and *Macrodiplosis roboris* (HARDY) on *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). Occurrence: intermediate (RÜBSAAMEN 1899c, MÖHN 1955a, PFÜTZENREITER & WEIDNER 1958). Distribution: European.

Mycocecis ovalis EDWARDS, 1922

Larvae develop in galls on *Hypoxylon julianii* PETRINI and *H. rubiginosum* (PERS.) FR. (Fungi: Xylariaceae) living on the bark of *Salix* sp. (Salicaceae) and *Cornus* sp. (Cornaceae) Occurrence: very rare (MÖHN 1955a). Distribution: European.

Mycodiplosis buhri HOLZ, 1970

Mycophagous larvae live in colonies of the fern rust *Hyalopsora polypodii* (PERS.) MAGNUS (Fungi: Pucciniastraceae) on *Cystopteris fragilis* (L.) BERN. (Filicales: Woodsiaceae). Occurrence: rare (HOLZ 1970). Distribution: European.

Mycodiplosis ceomatis (WINNERTZ, 1953)

White larvae live freely on leaves of *Rosa* sp. (Rosaceae) attacked by the rust *Caeoma miniatum* (PERS.) SCHLTDL. (Fungi: Pucciniales). Larvae feed on spores. Occurrence: rare (WINNERTZ 1853). Distribution: European.

Mycodiplosis coniophaga (WINNERTZ, 1853)

Whitish larvae live in colonies of various rusts, mainly *Phragmidium* spp. and *Puccinia* spp. associated with various host plants, e.g. on *Cirsium arvense* (L.) SCOP. infested with *Puccinia punctiformis* (STRAUSS) RÖHL. (Fungi: Pucciniacae). Occurrence: very frequent (WINNERTZ 1853, RÜBSAAMEN 1889b, HOLZ 1970, KLUTH et al.1997). Distribution: European, secondarily Holarctic.

Mycodiplosis erysiphes (RÜBSAAMEN, 1889)

Mycophagous larvae live in colonies of the powdery mildew *Golovinomyces cichoracearum* (DC.) HELUTA (Fungi: Erysiphaceae) on the leaves of *Hieracium murorum* L. (Asteraceae) and on other Erysiphaceae. Occurrence: frequent (RÜBSAAMEN 1889b, HOLZ 1970). Distribution: European.

Mycodiplosis gloeopeniophorae (RÜBSAAMEN, 1925)

Mycophagous larvae live in colonies of the bark fungi *Peniophora aurantiaca* (BRES.) HÖHN. & LITSCH. on *Alnus viridis* (CHAIX) DC. (Betulaceae) respectively in colonies of *Peniophora cinerea* (PERS.) COOKE (Fungi: *Peniophora*ceae) on *Salix cinerea* L. (Salicaceae). Type locality: Triglitz/Prignitz. Occurrence: rare (RÜBSAAMEN & HEDICKE 1925-1939, HOLZ 1970). Distribution: European.

Mycodiplosis hetrosaetosa HOLZ, 1970

Mycophagous larvae live in colonies of powdery mildews *Erysiphe* spp. and *Sphaerotheca* spp. (Fungi: Erysiphaceae). Type locality: Kelbra-Kyffhäuser (Thuringia). Occurrence: frequent (HOLZ 1970). Distribution: European.

Mycodiplosis isosaetosa HOLZ, 1970

Mycophagous larvae live in colonies of powdery mildews *Erysiphe* spp. and *Sphaerotheca* spp. (Fungi: Erysiphaceae). Type locality: Lorch (Württemberg). Occurrence: intermediate (HOLZ 1970). Distribution: European.

Mycodiplosis limbata (WINNERTZ, 1853)

Adults were reared from rosette galls on *Salix triandra* L. (Salicaceae) induced by the gall midge *Rhabdophaga heterobia* LOEW and infested with the rust *Melampsora salicina* DESM. (Fungi: Melampsoraceae). Occurrence: rare (WINNERTZ 1853). Distribution: European.

Mycodiplosis melampsorae (RÜBSAAMEN, 1889)

Mycodiplosis jaapi RÜBSAAMEN, 1925

Mycophagous larvae live in colonies of the rust *Melampsora salicina* DESM. (Fungi: Melampsoraceae) on the leaves of *Salix* sp. (Salicaceae). Type locality: Siegen. Occurrence: very frequent (RÜBSAAMEN 1889a, 1912, RÜBSAAMEN & HEDICKE 1925-1939, MÖHN 1955a, HOLZ 1970, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b). Distribution: Eurosiberian.

Mycodiplosis oidii (HARDY, 1854)

Mycophagous larvae live in colonies of powdery mildews *Erysiphe* spp, *Microsphaera* spp. and *Sphaerotheca* spp. (Fungi: Erysiphaceae). Occurrence: intermediate (HOLZ 1970). Distribution: European.

Mycodiplosis plasmoparae RÜBSAAMEN, 1906, **restored name**

Isodiplosis involuta RÜBSAAMEN, 1910, *Isodiplosis deutera* MILNE, 1960

GAGNÉ (2004: 204) and GAGNÉ & JASCHHOF (2014: 273) synonymised *Mycodiplosis plasmoparae* RÜBS. with *Mycodiplosis inimica* (FITCH, 1861). SKUHRAVÁ (1989: 228) synoymised *Isodiplosis involuta* RÜBS. and *Isodiplosis deutera* MILNE with *Mycodiplosis plasmoparae* RÜBS., because *Mycodiplosis plasmoparae* RÜBS. differs from *Mycodiplosis inimica* (FITCH) substantially by the shape of the male terminalia (compare figures in RÜBSAAMEN 1906: 196, Fig. 25b, for *M. plasmoparae* RÜBS. and GAGNÉ 1981: 275, Fig. 101 *M. inimica*). Rübsaamen (1906) reared adults from mycophagous larvae feeding on the downy mildew *Plasmopara viticola* (BERK. & CURTIS) BERL. & DE TONI (Fungi: Peronosporaceae) on leaves of *Vitis vinifera* L. (Vitaceae). Occurrence: frequent (RÜBSAAMEN 1906, 1912, HOLZ 1970, SKUHRAVÁ in WEBER 1995). Distribution: European

Mycodiplosis pucciniae (RÜBSAAMEN, 1889)

Pink larvae live in colonies of the rust *Puccinia calcitrapae* DC. (Fungi: Pucciniaceae) on leaves of *Leontodon autumnalis* L. (Asteraceae). Occurrence: frequent (RÜBSAAMEN 1889b, HOLZ 1970, WERNER 1997). Distribution: European.

Mycodiplosis saundersi BARNES, 1927

Larvae are mycophagous and live in colonies of the rust *Puccinia punctiformis* (STRAUSS) RÖHL. (Fungi: Pucciniaceae) on *Cirsium arvense* (L.) SCOP. (Asteraceae). Occurrence: very rare (SKUHRAVÁ & SKUHRAVÝ 1992a). Distribution: Eurosiberian.

Mycodiplosis sphaerothecae (RÜBSAAMEN, 1889)

White larvae live in colonies of the powdery mildew *Podosphaera macularis* (WALLR.) BRAUN & TAKAM (Fungi: Erysiphaceae) on *Humulus lupulus* L. (Cannabaceae). Occurrence: frequent (RÜBSAAMEN 1889b, 1891c, 1910, HOLZ 1970). Distribution: European.

Mycodiplosis tussilaginis KIEFFER, 1895

Mycophagous larvae were found in colonies of the rust *Puccinia poarum* NIELSEN (Fungi: Pucciniales) on *Tussilago farfara* L. (Asteraceae) respectively on *Poa* spp. (Poaceae). Occurrence: very rare (SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.

Neoisodiplosis corticii (RÜBSAAMEN, 1925)

Mycophagous larvae live in colonies of the bark fungus *Corticium lacteum* (FR.) FR. (Fungi: Corticaceae) on dead wood. Occurrence: very rare (RÜBSAAMEN & HEDICKE 1925-1939, HOLZ 1970). Distribution: European.

Neoisodiplosis longisaetosa HOLZ, 1970

Mycophagous larvae live on fruit bodies of the bark fungus *Peniophora cinerea* (PERS.) COOKE (Fungi: Peniophoraceae) on dead wood. Occurrence: very rare (HOLZ 1970). Distribution: European.

Neomikiella beckiana (MIK, 1885)

Yellow red larvae live in leaf bud galls on *Inula conyza* DC. (Asteraceae). Occurrence: frequent. References: MIK 1885, JAAP 1924-1925, LANGE 1936, MÖHN 1955a, BUHR 1960, HUBER 1969b, OSCHMANN 2000. Distribution: Submediterranean.

Neomikiella lychnidis (VALLOT, 1827)

Cecidomyia lychnidis V. HEYDEN, 1861

Whitish larvae develop in large, densely haired leaf bud galls on stems of *Silene latifolia* POIR. (Caryophyllaceae). Occurrence: very frequent. References: V. HEYDEN 1861, HIERONYMUS 1890, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1918, 1923, 1928, BUHR 1929, SCHLEICHER 1935, LANGE 1936, ZELLER 1940, WEIDNER & WEIDNER 1951, HAASE & UTECH 1971, MEYER 1984, PICHINOT & MEYER 1998, KWAST 2012. Distribution: European, Submediterranean.

Neomycodiplosis ruebsaameni HOLZ, 1970

Mycophagous larvae live on fruit bodies of *Peniophorella pubera* (FR.) KARST. (Fungi: Agaricomycetes) Occurrence: very rare (HOLZ 1970). Distribution: European.

Obolodiplosis robiniae (HALDEMAN, 1847)

White larvae cause galls on leaflets of *Robinia pseudoacacia* L. (Fabaceae). The margin of attacked leaflets is swollen and rolled downwards; galls occurred abruptly in 2006 in Germany and very fastly distributed throughout Europe (SKUHRAVÁ et al. 2007, SKUHRAVÁ 2010). Occurrence: very frequent (BATHON 2007, HOFFMANN et al. 2007, WEHRMAKER 2007, LEHMANN & FLÜGEL 2012, BUHR H.J. 2013, STAUDT 2013). Distribution: alien species; Nearctic,

Octodiplosis glyceriae (RÜBSAAMEN, 1895)

Yellow-red larvae live under the epidermis of inner walls of leaf sheaths of *Glyceria maxima* (HARTM.) HOLMBERG (Poaceae). Type locality: Plötzensee, Berlin. Occurrence: very rare (RÜBSAAMEN 1895b). Distribution: European.

Oligotrophus gemmarum (RÜBSAAMEN, 1914)

Schmidtiella gemmarum RÜBSAAMEN, 1914; synonymy according to HARRIS et al. (2006).

Larvae cause small unconspicuous bud galls on branches of *Juniperus communis* L. (Cupressaceae). The gall is only 3 mm long and consists of one whorl of needles. Occurrence: intermediate (RÜBSAAMEN 1914, HEDICKE 1917-1918, JAAP 1918, BUHR 1929, LUDWIG 1935, SCHLEICHER 1935). Distribution: European.

Oligotrophus juniperinus (LINNAEUS, 1758)

Solitary orange larvae cause galls on *Juniperus communis* L. (Cupressaceae). The galls are slender, about 12 mm long, involving more than two verticils of needles. Outer needles of the gall have recurved tips. One generation develops per year. Larvae pupate in the gall. Occurrence: frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, TOEPFER 1918, ROSS 1922c, LUDWIG 1935, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, MÖHN 1955a, BUHR 1966, HAASE & UTECH 1971, SCHRÖPPEL 1982, OSCHMANN 2000, BUHR H.J. 2013). Distribution: European.

Oligotrophus panteli KIEFFER, 1898

Solitary orange larvae live in galls on *Juniperus communis* L. (Cupressaceae). The gall has a bulbous base and pointed apex. One generation develops per year. Larvae pupate in the gall. Occurrence: frequent (ROSS 1916, JAAP 1918, BUHR 1929, LUDWIG 1935, SCHLEICHER 1935, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1982). Distribution: European, North African.

Oligotrophus schmidti RÜBSAAMEN, 1914

Larvae cause small galls on *Juniperus communis* L. (Cupressaceae). One generation develops per year. Larvae pupate in the gall. Occurrence: frequent (JAAP 1918, 1924-1925, ROSS 1922c, SCHLEICHER 1935). Distribution: European.

Ozirhincus anthemidis (RÜBSAAMEN, 1915)

Solitary orange larvae develop in the achenes of the flower heads of *Anthemis arvensis* L. (Asteraceae). Occurrence: frequent (RÜBSAAMEN 1915, JAAP 1918, MÖHN 1955a, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European, including Turkey.

Ozirhincus longicollis RONDANI, 1840

Lasioptera chrysanthemi LOEW, 1850; *Clinorrhyncha crassipes* WINNERTZ, 1853; *Clinorrhyncha leucanthemi* KIEFFER, 1898

Solitary orange larvae develop in achenes of the flower heads of *Leucanthemum vulgare* LAM. (Asteraceae) in two generations per year. Larvae pupate and hibernate in the galls. Occurrence: frequent (WINNERTZ 1853, RÜBSAAMEN 1890a, SACK 1907, JAAP 1918, 1928, LUDWIG 1935, SCHLEICHER 1935, MÖHN 1966-1971). Distribution: European, North African.

Ozirhincus millefolii (WACHTL, 1884)

Solitary orange larvae develop in the achenes in the flower heads of *Achillea millefolium* L. (Asteraceae) in two generations per year. Larvae pupate and hibernate in the galls. Occurrence: frequent (RÜBSAAMEN 1890a, LUDWIG 1935, MÖHN 1955a, BUHR 1966, MÖHN 1966-1971, SKUHRAVÁ & SKUHRAVÝ 1992a). Distribution: Eurosiberian, immigrant in Nearctic.

Ozirhincus tanaceti (KIEFFER, 1889)

Solitary orange larvae develop in the achenes in the flower heads of *Tanacetum vulgare* L. (Asteraceae). Two generations develop per year. Larvae pupate and hibernate in the galls. Occurrence: frequent (RÜBSAAMEN 1890a, SACK 1907, LUDWIG 1935, SCHLEICHER 1935, BUHR 1966, MÖHN 1966-1971, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, MEYER 1984, SCHMITZ 1996, 1998a, 1999, PICHINOT & MEYER 1998). Distribution: Eurosiberian.

Paradiplosis abietispectinatae (TUBEUF, 1930)

Agevillea abietis HUBAULT, 1945

Solitary orange larvae live in the parenchyma of needles of *Abies alba* MILL. (Pinaceae). One generation develops per year. Larvae hibernate and pupate in the galls. It was a major pest of the fir in the past; e.g. in Bavaria in the period 1957-1963; at present it is a minor pest in Central Europe (SKUHRAVÁ & ROQUES 2000). Occurrence: rare (POSTNER 1957, 1959a, !959b, 1960a, 1960b, 1960c, 1962b, 1973a, 1973b, 1973c). Distribution: European.

Parallelodiplosis bupleuri (RÜBSAAMEN, 1895)

Red-yellow larvae live in deformed fruits of *Bupleurum falcatum* L. (Apiaceae). Type locality: Sinzig. Occurrence: intermediate (RÜBSAAMEN 1895c, ROSS 1922c, JAAP 1924-1925, LANGE 1936). Distribution: Eurosiberian.

Parallelodiplosis galliperda (F. LÖW, 1889)

Orange-yellow larvae live as inquilines on the underside of the galls of the gall wasp *Neuroterus quercusbaccarum* L. (Hymenoptera, Cynipidae) that live on the leaves of *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). Occurrence: frequent (MÖHN 1955a, PFÜTZENREITER & WEIDNER 1958, WEIDNER 1960, OSCHMANN 2000). Distribution: European.

Phegomyia fagicola (KIEFFER, 1901)

Reddish larvae cause galls in form of leaf folds along lateral veins on *Fagus sylvatica* L. (Fagaceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: very frequent (HEDICKE 1917-1918, ROSS 1922c, JAAP 1924-1925, 1928, BUHR 1929, NIESSEN 1928, LUDWIG 1935, SCHLEICHER 1935, WEIDNER & WEIDNER 1951, MÖHN 1955a, BROMM 1964, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992b, OSCHMANN 2000, STAUDT 2013). Distribution: European.

Physemocecis hartigi (LIEBEL, 1892)

White larvae develop in rounded parenchymous galls on the leaves of *Tilia platyphyllos* SCOP. and *T. cordata* MILL. (Tiliaceae) in one generation per year. Larvae hibernate in the soil. Occurrence: very frequent (ROSS 1916, HEDICKE 1917-1918, JAAP 1924-1925, BUHR 1929, 1930, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, HAASE & UTECH 1971, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1992a, OSCHMANN 2000, KRUSE 2009, KWAST 2012). Distribution: European, up to Turkey.

Physemocecis ulmi (KIEFFER, 1909)

Physemocecis ulmi Rübsaamen, 1914

White larvae develop in small blisters on the leaves of *Ulmus minor* MILL. and *U. glabra* HUDS. (Ulmaceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: frequent (RÜBSAAMEN 1914, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, ROSS 1922c, SCHLEICHER 1935, ZELLER 1941, MÖHN 1955a, BUHR 1929, 1966, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1984, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, OSCHMANN 2000). Distribution: European.

Placochela ligustri (RÜBSAAMEN, 1899), **restored name**

TOKUDA et al. (2005) synonymized *Placocela ligustri* (RÜBS.) under *Placochela nigripes* (F. LÖW) on the basis on DNA analyses. These two species differ in morphological characters (shape and size) of sclerotized hooks on terminal abdominal segments of larvae (as they are figured in MÖHN 1955a, Table 16: 5-6, 7-8), by different biology and distribution. Therefore we consider *Placochela ligustri* (RÜBS.) to be an independent species, not a synonym of *Placochela nigripes* (F. LÖW). Pale yellow larvae develop in slightly swollen, unopened flower bud of *Ligustrum vulgare* L. (Oleaceae). Type locality: Linz am Rhein. Occurrence: very frequent (V. SCHLECHTENDAL 1883, RÜBSAAMEN 1899c, ROSS 1916, 1922c, JAAP 1925, MÖHN 1955a, PICHINOT & MEYER 1998, OSCHMANN 2000, BUHR H.J. 2013. Distribution: European.

Placochela nigripes (F. LÖW, 1877)

Schizomyia propinqua RÜBSAAMEN, 1889

Orange-red larvae develop in swollen flower buds of *Sambucus nigra* L. and *S. ebulus* L. (Caprifoliaceae). One generation develops per year. Larvae hibernate in the soil. Occurrence: very frequent (RÜBSAAMEN 1889a, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, 1928, SCHLEICHER 1935, BUHR 1939, ZELLER 1940, 1941, WEIDNER & WEID-

NER 1951, MÖHN 1955a, HUBER 1969b, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, BUHR H.J. 2013). Distribution: European.

Planetella arenariae (RÜBSAAMEN, 1899)

Larvae cause small plurilocular galls on leaves and stems of *Carex arenaria* L. (Cyperaceae). Usually two generations develop per year. Larvae hibernate and pupate in the galls. Occurrence: rare (RÜBSAAMEN 1899c, HEDICKE 1917-1918, SCHLEICHER 1935, PICHINOT & MEYER 1998). Distribution: European.

Planetella caricis (RÜBSAAMEN, 1911)

Larvae cause corn-like, pointed galls on stems of various species of *Carex* (Cyperaceae), each gall with only one larva. Occurrence: intermediate (RÜBSAAMEN 1911, HEDICKE 1917-1918, PICHINOT & MEYER 1998). Distribution: European.

Planetella cornifex (KIEFFER, 1898)

Larvae cause horn-shaped galls on stems of *Carex pallescens* L. and *C. elata* ALL. (Cyperaceae), each gall with one larva. Occurrence: very rare (SCHRÖPPEL 1981). Distribution: European.

Planetella cucullata (MEIGEN, 1818)

Biology unknown. Only a male was caught and described by MEIGEN (1818). Occurrence: rare. Distribution: European.

Planetella fischeri (FRAUENFELD, 1867)

Hormomyia Fischeri FRAUENFELD, 1867; *Hormomyia hieronymi* KIEFFER, 1909

Larvae produce plurilocular thin-walled swellings at the base of the leaves of *Carex pilosa* SCOP., *C. hirta* L. and other species of the genus *Carex* (Cyperaceae). Occurrence: rare (HIERONYMUS 1890, HEDICKE 1917-1918, SCHLEICHER 1935). Distribution: European.

Planetella gallarum (RÜBSAAMEN, 1899)

White larvae cause small smooth galls, usually brown coloured, on leaves and stems of various *Carex*-species (Cyperaceae). Each gall with only one chamber containing one larva which pupates there. Occurrence: frequent (RÜBSAAMEN 1899c, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1918, 1925, BUHR 1930, SCHLEICHER 1935, SCHRÖPPEL 1981, PICHINOT & MEYER 1998). Distribution: European.

Planetella grandis (MEIGEN, 1804)

Cecidomyia fasciata MEIGEN, 1818; *Cecidomyia grossa* BREMI, 1847; *Cecidomyia ampla* WALKER, 1856; *Hormomyia dubitata* RÜBSAAMEN, 1892

Biology unknown. MEIGEN (1804) in the description gave information that adults fly in the forest in May. RÜBSAAMEN (1892a) wrote that he found several females of this species in the collection of H. Loew preserved at that time in the Königl. Museum für Naturkunde zu Berlin. It is one of the largest gall midges in Europe with size of the body 6.54 mm. Occurrence: rare (MEIGEN 1804, BREMI 1847, RÜBSAAMEN 1892a). Distribution: European.

Planetella granifex (KIEFFER, 1898)

Larvae cause braun, corn-like galls on the lower part of the stem (on neck) of *Carex echinata* MURRAY, *C. pallescens* L. and *C. elata* ALL. (Cyperaceae). Occurrence: rare (HEDICKE 1917-1918, LUDWIG 1935, RÜBSAAMEN 1892). Distribution: European.

Planetella producta (MEIGEN, 1830)

Biology unknown. MEIGEN (1830) caught a male in forest before the end of June. Occurrence: very rare (MEIGEN 1830, LINDNER 1955). Distribution: European.

Planetella rosenhaueri (RÜBSAAMEN, 1892)

Larvae produce plurilocular thin-walled swellings at the base of the leaves of *Carex acuta* L. (Cyperaceae). Occurrence: rare (RÜBSAAMEN 1892, NIESSEN 1938). Distribution: European.

Planetella tarda (RÜBSAAMEN, 1914)

White larvae cause small smooth galls, usually brown coloured, on leaves and stems of *Carex vesicaria* L. (Cyperaceae). Type locality: Triglitz/Prignitz. Occurrence: rare (RÜBSAAMEN 1914, HEDICKE 1917-1918, JAAP 1918, SCHLEICHER 1935). Distribution: European.

Planetella tuberifica (RÜBSAAMEN, 1899)

Larvae cause slight swellings at the leaf base of *Carex elata* ALL. (Cyperaceae) with one chamber each. Attacked leaf is shortened. Occurrence: frequent (RÜBSAAMEN 1899c, HEDICKE 1917-1918, LUDWIG 1935). Distribution: European.

Planetella tumorifica (RÜBSAAMEN, 1899)

Larvae cause slight swellings at the leaf base of *Carex pseudocyperus* L. (Cyperaceae). Occurrence: rare (RÜBSAAMEN 1899c, HEDICKE 1917-1918, JAAP 1922, MÖHN 1955a). Distribution: European.

Planetella westermanni (MEIGEN, 1830)

Biology unknown. MEIGEN (1830) described a male that was caught at Kiel. He found it in the collection of Wiedemann. Occurrence: very rare (MEIGEN 1830). Distribution: European.

Planetella winnertzi (KIEFFER, 1898)

Biology unknown. Occurrence: very rare (KIEFFER 1898). Distribution: European.

Plemeliella abietina SEITNER, 1908

Yellow or pink-yellow larvae live in developing seed in the cones of *Picea abies* (L.) KARSTEN (Pinaceae). Infested seeds are slightly sunken, deformed and discoloured. The development lasts three years. Larvae feed sucking sap from the seed. Larvae hibernate in the seed. It is a minor pest (SKUHRAVÁ & ROQUES 2000). Occurrence: frequent (HOLSTE 1921, 1922, SCHLEICHER 1935, MÖHN 1955a, POSTNER 1982). Distribution: European.

Polystepha malpighii (KIEFFER, 1909)

Larvae cause circular blister galls on the leaves of *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). Occurrence: rare (HEDICKE 1917-1918, Jaap 1924, OSCHMANN 2000). Distribution: European.

Procystiphora gerardi MEYER, 1984

Larvae live under the leaf sheaths at the stem base of *Juncus gerardi* LOISEL. (Juncaceae). Type locality: Speicherbecken, Hauke-Haien-Koog near Ockholm. Occurrence: very rare (MEYER 1984, PICHINOT & MEYER 1998). Distribution: European.

Prodiplosis rhenana (RÜBSAAMEN, 1910)

Geisenheyneria rhenana RÜBSAAMEN, 1910

Larvae live as inquilines in galls of the gall midge *Dasineura erigerontis* RÜBS. on vegetative tips of *Erigeron acer* L. (Asteraceae). Occurrence: very rare (GEISENHEYNER 1902, RÜBSAAMEN 1910). Distribution: European.

Prolauthia circumdata (WINNERTZ, 1853)

Larvae live as inquilines in rosette galls caused by the gall midge *Dasineura crataegi* (WINNERTZ), on *Crataegus laevigata* (POIRET) DC. (Rosaceae). Occurrence: very rare (WINNERTZ 1853). Distribution: European.

Putoniella pruni (KALTENBACH, 1872)

Diplosis marsupialis F. LÖW, 1889

Orange-yellow larvae produce pouch or pocket-shaped swellings, usually along the mid veins on the leaves of *Prunus spinosa* L. and other *Prunus* species (Rosaceae) in one generation per year. Larvae hibernate in the soil. It is evaluated as a minor pest of plum trees (DARVAS et al. 2000). Occurrence: very frequent (KALTENBACH 1874, F. LÖW 1889b, RÜBSAAMEN 1890a, KÜSTER 1910, JAAP 1918, 1919-1920, 1924-1925, ROSS 1922c, 1922d, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER

1951, STELTER 1954, MÖHN 1955a, BUHR 1966, HUBER 1969b, SKUHRAVÁ & SKUHRAVÝ 1988, PICHINOT & MEYER 1998, OSCHMANN 2000, STAUDT 2013). Distribution: European.

Rabdophaga albipennis (LOEW, 1850)

Cecidomyia albipennis WINNERTZ, 1853

Orange-red larvae cause slight swellings of young twigs of *Salix alba* L. (Salicaceae). One generation develops per year. Larvae hibernate in the gall. Occurrence: very frequent (WINNERTZ 1853, JAAP 1918, LUDWIG 1935, SCHLEICHER 1935, NIESSEN 1937, STELTER 1969b, 1993, 1994a). Distribution: European.

Rabdophaga clavifex (KIEFFER, 1891)

Larvae cause club-like swelling at the branch tip of *Salix aurita* L., *S. caprea* L. and *S. cinerea* L. (Salicaceae). The gall is densely covered with white hairs, usually with 4-12 deformed buds. Each bud contains only one orange larva. One generation develops per year. Larvae hibernate in the gall. Occurrence: very frequent (HEDICKE 1917-1918, JAAP 1918, 1923, 1924, LUDWIG 1935, SCHLEICHER 1935, NIESSEN 1937, STELTER 1969c, 1977, 1982a, 1989a, STELTER & BUHR 1964, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1984, SKUHRAVÁ & SKUHRAVÝ 1992a, 1992b, STELTER 1993, OSCHMANN 2000). Distribution: Eurosiberian.

Rabdophaga degeerii (BREMI, 1847)

Rhabdophaga ramicola RÜBSAAMEN, 1916

Red-yellow larvae cause swelling on young, one-year twig of *Salix purpurea* L. (Salicaceae). The gall is lengthwise-rounded, strongly standing, rugged and encircles the twig. One generation develops per year. Larvae hibernate in the gall. Occurrence: very frequent (HIERONYMUS 1890, RÜBSAAMEN 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, ROSS 1922c, LUDWIG 1935, STELTER 1978a, 1988c, 1989b, 1993, PICHINOT & MEYER 1998). Distribution: European.

Rabdophaga deletrix (RÜBSAAMEN, 1921)

Yellow larvae develop in stunted leaf buds of *Salix alba* L. (Salicaceae) One generation develops per year. Larvae hibernate in the gall. Occurrence: rare (JAAP 1918, RÜBSAAMEN 1921). Distribution: European.

Rabdophaga dubiosa (KIEFFER, 1913) (Fig. 3C)

Rhabdophaga dubia KIEFFER, 1891

Yellowish-red larvae cause swellings on twigs of *Salix aurita* L., *S. cinerea* L. and *S. alba* L. (Salicaceae). The gall is 15–20 mm long, 8–12 mm broad, inside with many lenghtwise chambers each containing one larva. One generation develops per year. Larvae hibernate in the galls. Occurrence: very frequent (ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1924-1925, SCHLEICHER 1935, WEIDNER 1950, MÖHN 1955a, STELTER 1954, 1956, 1980, 1993, BUHR 1966, HUBER 1969b, PICHINOT & MEYER 1998). Distribution: European.

Rabdophaga exsiccans (RÜBSAAMEN, 1915)

Larvae develop under the bark of slightly swollen young branch of *Salix repens* L. (Salicaceae). Attacked branch wither away. Type locality: Triglitz/Prignitz. Occurrence: rare (RÜBSAAMEN 1915, HEDICKE 1917-1918, JAAP 1918, STELTER 1982a). Distribution: European.

Rabdophaga gemmicola (KIEFFER, 1896)

Rhabdophaga gemmarum RÜBSAAMEN, 1915

Yellow-red larvae develop in strongly swollen buds on the branches of *Salix aurita* L. and *S. cinerea* L. (Salicaceae) in one generation per year. Larva pupates in the gall. Occurrence: frequent (RÜBSAAMEN 1915, JAAP 1918, SCHLEICHER 1935, BUHR 1966, STELTER 1977, 1982a, 1993, 1994a). Distribution: European.

Rabdophaga giraudiana (KIEFFER, 1898)

Larvae live in the timber of the branches of *Populus alba* L. and *P. tremula* L. (Salicaceae) and cause elongated swellings. The subcortical layer is weakened and made rotten by the numerous larvae. Occurrence: rare (SCHLEICHER 1935). Distribution: European.

Rabdophaga heterobia (LOEW, 1850) (Fig. 3D)

Several orange-red larvae cause galls on *Salix triandra* L. (Salicaceae). Two generations develop per year. Larvae of hibernating generation develop in deformed and swollen male catkins where they also pupate. Larvae of summer generation develop in small rosettes of haired leaves at the extremities of the shoots or in swollen lateral buds or lateral rosettes. BARNES (1949) made extensive experiments with host plant range and found that *R. heterobia* (LOEW) is specificly associated to *Salix triandra* L. Similar galls on *Salix repens* L., *S. purpurea* L. and other species of *Salix* cited in the literature and summarized by HOUARD (1908-1909) as food plants are caused by another species of the genus *Rabdophaga*. Occurrence: very frequent (RUDOW 1875a, 1875b, RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, 1928, BUHR 1930, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, WEIDNER 1950, 1962, MÖHN 1955a, BUHR 1966, HUBER 1969b, ESCHELMÜLLER & KLEMENT 1974, STELTER 1969c, 1982c, 1993, 1994a SCHRÖPPEL 1984, PICHINOT & MEYER 1998). Distribution: Eurosiberian, including Kazakhstan.

Rabdophaga insignis (KIEFFER, 1906)

Larvae cause conspicuous galls on leaf buds and adjacent areas on the branches of *Salix purpurea* L. (Salicaceae). The emergence opening is at the base of the attacked bud. One generation develops per year. Larvae hibernate in the galls. Occurrence: rare (JAAP 1924-1925, STELTER 1989b). Distribution: European.

Rabdophaga iteobia (KIEFFER, 1890)

Orange larvae live gregariously among the leaves, densely covered with white hairs, forming a loose rosette gall at the top of the branch of *Salix caprea* L. (Salicaceae). The leaves of the shortened internodium are clustered, abnormally white haired. One generation develops per year. Larvae hibernate in the galls. Occurrence: very frequent (HIERONYMUS 1890, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1923, 1924-1925, SCHLEICHER 1935, NIESSEN 1938, WEIDNER & WEIDNER 1951, BUHR 1966, HUBER 1969b, STELTER 1977, SKUHRAVÁ & SKUHRAVÝ 1992a, 1992b, OSCHMANN 2000). Distribution: Eurosiberian.

Rabdophaga jaapi (RÜBSAAMEN, 1915)

Dasineura repentis SKUHRAVÁ, 1986

Solitary red-yellow larvae cause small fusiform leaf bud galls at the vegetative tips of *Salix repens* L. (Salicaceae) in one generation per year. Larvae hibernate in the galls. Type locality: Hamburg. Occurrence: frequent (HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1929, 1939, 1966, SCHLEICHER 1935, LANGE 1936, ZELLER 1940, 1941, STELTER 1982a, KWAST 2012). Distribution: Eurosiberian.

Rabdophaga justini (BARNES, 1935)

Solitary larvae develop under the bark of the one year old twigs of *Salix purpurea* L. (Salicaceae) in the proximity of buds. The damage appears as „shot holes". Two generations develop per year. Occurrence: very rare (STELTER 1989b, 1994a). Distribution: European.

Rabdophaga karschi (KIEFFER, 1891)

Rhabdophaga oculiperda RÜBSAAMEN, 1921: STELTER 1980, 1993

Orange larvae cause slender, cylindrical or fusiform, swellings on thin branches of *Salix aurita* L. and *S. cinerea* L. (Salicaceae). One generation develops per year. Larvae hiber-

nate in the galls. Occurrence: frequent (HEDICKE 1917-1918, JAAP 1918, SCHLEICHER 1935, STELTER 1978a, 1980, 1982a, 1988c, 1993, 1994a, STAUDT 2013). Distribution: European.

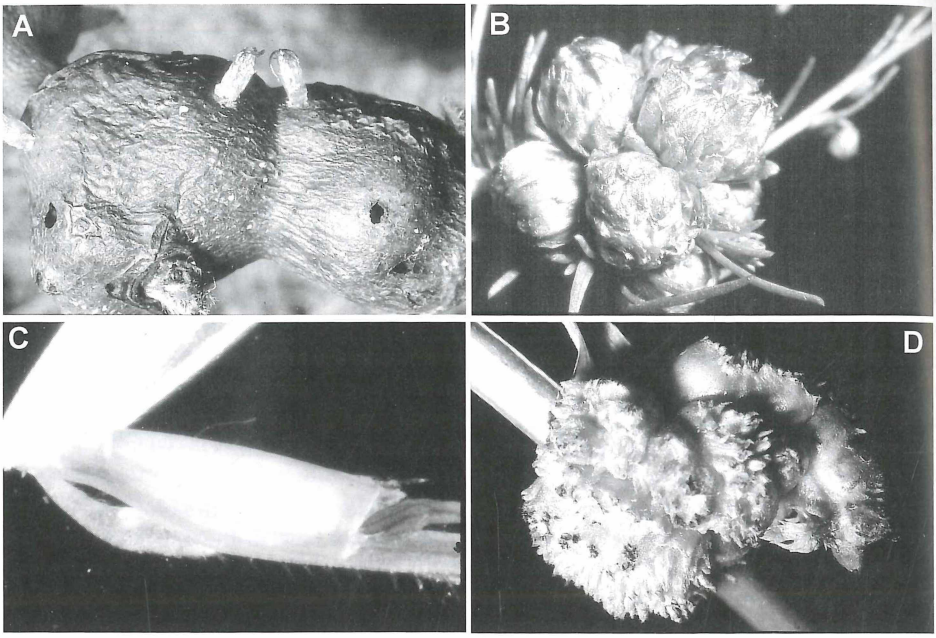

Fig. 4: Galls of *Rabdohaga salicis* on *Salix caprea* (A), *Rhopalomyia artemisiae* on *Artemisia campestris* (B), *Stenodiplosis bromicola* on *Bromus hordeaceus* (C), and *Rhopalomyia tanaceticola* on *Tanacetum vulgare* (D) (Photos: H. Meyer).

Rabdophaga lattkei STELTER, 1994

Orange-red larvae develop in one-year shoot of *Salix pentandra* L. (Salicaceae); the swelling is indistinct. Type locality: Kirch-Baggendorf/Grimmen. Occurrence: rare (STELTER 1994a). Distribution: European.

Rabdophaga lindhardti STELTER, 1989

Solitary larvae develop in buds on the branches of *Salix purpurea* L. (Salicaceae). Type locality: Töpchin, Königswusterhausen. Occurrence: very rare (STELTER 1989a, 1889b). Distribution: European.

Rabdophaga marginemtorquens (BREMI, 1847)

Orange-yellow larvae live in tightly rolled leaf margins of *Salix viminalis* L. (Salicaceae). The rolled part is usually continuous, swollen and discoloured white or red. Two or three generations develop per year. Larvae pupate in the galls and hibernate in the soil. Occurrence: very frequent (WINNERTZ 1853, RUDOW 1875a, 1875b, RÜBSAAMEN 1889a, 1890a, KÜSTER 1910, ROSS 1916, 1922d, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, 1928, LUDWIG 1935, BUHR 1929, 1966, SCHLEICHER 1935, LANGE 1936, WEIDNER & WEIDNER 1951, BROMM 1964, HUBER 1969b, ESCHELMÜLLER & KLEMENT 1974, SCHRÖPPEL 1984, SKUHRAVÁ & SKUHRAVÝ 1988, STELTER 1989c, 1993, OSCHMANN 2000, STAUDT 2013). Distribution: Eurosiberian.

Rabdophaga nervorum (KIEFFER, 1895)

Dichelomyia noduli RÜBSAAMEN, 1895

Red-yellow larvae develop in spindle-shaped swellings of the midvein on the leaves of *Salix caprea* L. and *S. aurita* L. (Salicaceae). Each swelling contains only one larva. It pupates in the gall. Occurrence: very frequent (HIERONYMUS 1890, RÜBSAAMEN 1895c, 1915, ROSS 1916, HEDICKE 1917-1918, JAAP 1928, BUHR 1930, 1939, BENICK 1932, LUDWIG 1935, SCHLEICHER 1935, ZELLER 1941, BROMM 1964, HUBER 1969b, ESCHELMÜLLER & KLEMENT 1974, SCHRÖPPEL 1984, STELTER 1993). Distribution: European.

Rabdophaga nielsenii (KIEFFER ET NIELSEN, 1906)

Orange larvae develop in longitudinal swellings on the twig of *Salix* sp. (Salicaceae). Probably one generation develops per year. Occurrence: rare (JAAP 1918, 1928, SCHLEICHER 1935, STELTER 1984). Distribution: European.

Rabdophaga paliumparens (STELTER, 1977)

Larvae develop in slender 4-5 mm long, 2-2.5 mm broad gall on the shoot of *Salix aurita* L. and *S. cinerea* L. (Salicaceae). The gall was described by RÜBSAAMEN (1892a). Type locality: Groß Lüsewitz. Occurrence: intermediate (STELTER 1977). Distribution: European.

Rabdophaga pierreana (KIEFFER, 1909)

Red larvae develop gregariously in a large chamber inside the gall at the top of the branch of *Salix aurita* L. (Salicaceae). Up to 22 larvae live together in one chamber. Probably only one generation develops per year. Larvae hibernate in the soil. Occurrence: rare (ROSS 1922c, BUHR 1966, HUBER 1969b, SCHRÖPPEL 1984). Distribution: European.

Rabdophaga pierrei (KIEFFER, 1896)

Solitary larvae develop in chambers under the bark of the branches of *Salix aurita* L., *S. cinerea* L. and *S. caprea* L. (Salicaceae). Chambers are situated perpendiculary to the axis of the branch. One generation develops per year. Larvae hibernate in the gall. Occurrence: frequent (HEDICKE 1917-1918, JAAP 1918, 1928, SCHLEICHER 1935, STELTER 1954, 1980, MÖHN 1955a). Distribution: European.

Rabdophaga pseudococcus (THOMAS, 1890)

Dasineura pseudococcus (THOMAS, 1890)

Larvae develop in parenchyma under the epidermis of leaves of *Salix aurita* L. and *S. cinerea* L. (Salicaceae). Larvae hibernate in galls where they also pupate in the spring of the next year. Type locality: Ohrdruf. Occurrence: frequent (THOMAS 1890a, 1890b, RÜBSAAMEN 1890c). Distribution: European.

Rabdophaga pulvini (KIEFFER, 1891)

Bertieria superna KIEFFER, 1896

Solitary orange larvae develop in slightly swollen axillary buds on the branches of *Salix aurita* L. and *S. cinerea* L. (Salicaceae) in one generation per year. Larvae hibernate in the galls. Occurrence: very frequent (JAAP 1918, 1923, 1924, ROSS 1922c, SCHLEICHER 1935, BUHR 1966, ESCHELMÜLLER & KLEMENT 1974, SCHRÖPPEL 1984, STELTER 1970b, 1977, 1982a, 1989a, 1993). Distribution: European.

Rabdophaga repenticola (STELTER, 1964)

Larvae live in leaf bud galls on *Salix repens* L. and *S. rosmarinifolia* L. (Salicaceae) in one generation per year. Larvae hibernate in the galls. Type locality: Groß Lüsewitz. Occurrence: frequent (STELTER 1982a, 1989a, STELTER & BUHR 1964). Distribution: European.

Rabdophaga repentiperda (STELTER, 1982)

Larvae develop in wood layers of two-year shoots on *Salix repens* L. ssp. *dunensis* ROUY (Salicaceae). Larval chambers are arranged lengthwise and visible after bark removing. Type locality: Neuhaus, penisula Rerik. Occurrence: very rare (STELTER 1982a, 1994a). Distribution: European.

Rabdophaga rosaria (LOEW, 1850)

Cecidomyia cinerearum HARDY, 1850; nec *Rabdophaga strobilina* (BREMI, 1847) (HARRIS (2006) Solitary orange red larvae cause large rosette leaf galls on terminals or lateral buds of *Salix alba* L. and related species of *Salix* (Salicaceae) in one generation per year. Hibernation and pupation takes place in the gall. Occurrence: extremely frequent (BEUTHIN 1887, RUDOW 1875a, 1875b, HIERONYMUS, 1890, RÜBSAAMEN 1890a, SACK 1907, KÜSTER 1910, KRÖBER 1910, ROSS 1916, 1922c, 1922d, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1922, 1923, 1924-1925, 1928, BUHR 1929, 1930, 1966, MARESQUELLE 1931, BENICK 1932, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, NIESSEN 1937, ZELLER 1941, WEIDNER 1950, MÖHN 1955a, KÜHLHORN 1957, SCHOLZ-GÜNTHER 1957 (pest on willows), WEIDNER & WEIDNER 1951, BROMM 1964, HUBER 1969b, HAASE & UTECH 1971, DREWECK 1980, SCHRÖPPEL 1984, HEMMERLING 1987, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, STELTER 1969c, 1970a, 1977, 1982a, 1989b, 1993, OSCHMANN 2000, KRUSE 2009, LEHMANN & FLÜGEL 2012, STAUDT 2013). Distribution: Eurosiberian

Rabdophaga rosariella (KIEFFER, 1897)

Solitary larvae develop in buds on the branches of *Salix aurita* L. and *S. cinerea* L. (Salicaceae). The pea sized gall is formed like a very small leaf rosette. Only one generation develops per year. Larvae hibernate in galls. Occurrence: frequent (JAAP 1918, BUHR 1966). Distribution: European.

Rabdophaga roskami STELTER, 1989

Larvae live in tightly rolled leaf margins of *Salix viminalis* L. (Salicaceae). The gall is very similar to galls caused by *R. marginemtorquens* (BREMI) but the females of *R. roskami* STELTER differ in morphological characters from females of *R. marginemtorquens* (BREMI). Occurrence: intermediate (STELTER 1989c). Distribution: European.

Rabdophaga saliciperda (DUFOUR, 1841)

Greenish-yellow or whitish orange coloured larvae develop under the bark of the twigs of *Salix alba* L. and *S. fragilis* L. (Salicaceae). Each larva lies in a separate cavity parallel to the long axis of the shoot. Attached branches are irregularly swollen; the bark cracks and falls away. Minute circular holes („shot holes") remain after emergence of adults. One generation develops per year. Larvae pupate in their chambers. If it occurs abundantly it may be a pest. SEN (1938a, 1938b) studied the biology, host plants and harmfulness. Occurrence: very frequent (RUDOW 1875a, RÜBSAAMEN 1890a, SACK 1907, KRÖBER 1910, HEDICKE 1917-1918, JAAP 1918, 1923, 1924-1925, 1928, BUHR 1929, 1930, 1939, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, MÖHN 1955a, STELTER 1969b, 1993, 1994a PICHINOT & MEYER 1998, OSCHMANN 2000). Distribution: Eurosiberian.

Rabdophaga salicis (SCHRANK, 1803) (Fig. 4A)

Orange coloured larvae cause obvious, woody, fusiform or spherical, plurilocular swelling on the branches of *Salix cinerea* L., *S. aurita* L. and *S. caprea* L. (Salicaceae). One generation develops per year. Larvae hibernate and pupate in the gall. Occurrence: extremely frequent (SCHRANK 1803, RUDOW 1875a, 1875b, BEUTHIN 1887, RÜBSAAMEN 1890a, 1892a, 1895, HIERONYMUS 1890, KRÖBER 1910, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1928, TOEPFER 1918, BUHR 1929, 1939, MARESQUELLE 1931, BENICK 1932, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, NIESSEN 1937, WEIDNER 1950, WEIDNER & WEIDNER 1951, STELTER 1955/56, 1978a, 1980, 1988c, 1993, BUHR 1966, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1984, STAUDT 2013). Distribution: Eurosiberian.

Rabdophaga schicki (STELTER, 1982)

Solitary larvae develop in spindle-shaped swellings on one- or two-years shoots of *Salix rosmarinifolia* L. (Salicaceae). The swelling is 15–20 mm long and 2-4 mm broad. One larva develops in the gall where it also pupates. One generation develops per year. Type locality: Groß Lüsewitz. Occurrence: very rare (STELTER 1982a). Distribution: European.

Rabdophaga schreiteri (STELTER, 1982)

Solitary larvae live as inquilines in galls of the gall midge *Rabdophaga rosaria* (LOEW) on *Salix rosmarinifolia* L. (Salicaceae). Type locality: River Warnow lowlands (Mecklenburg). Occurrence: very rare (STELTER 1982c, 1994a). Distribution: European.

Rabdophaga schwangarti (Rübsaamen, 1915)

RÜBSAAMEN (1915) in his description has written: „Braches of *Salix* sp. are deformed in similar way as by *Rabdophaga pierei* (KIEFFER) but the adults and larvae differ". Type locality: Neustadt a.d. Haardt. Occurrence: rare (only found by RÜBSAAMEN 1915). Distribution: European.

Rabdophaga strobilina (BREMI, 1847)

Orange larvae develop under the scales in large artichoke galls on *Salix purpurea* L. (Salicaceae). STELTER (1982c) considered *R. strobilina* (BREMI) to be an inquiline in galls caused by the gall midge *R. rosaria* (LOEW). Large gall is probably the result of coaction of the larva *R. rosaria* (LOEW) that develops in the central chamber and the larvae of *R. strobilina* (BREMI) developing under the scales of the gall. Occurrence: rare (RUDOW 1875a, 1875b, HIERONYMUS 1890, STELTER 1982c, 1989b). Distribution: European.

Rabdophaga terminalis (LOEW, 1850)

Cecidomyia iteophila LOEW, 1850; *Cecidomyia salicina* LOEW, 1850; synonymy according to STELTER (1993).

Orange or reddish larvae live gregariously in galls formed by terminal leaves of *Salix fragilis* L. and *S. alba* L. (Salicaceae). Terminal leaves remain curled, folded and crinkled. The growth of the shoot is stopped and side shoots develop. Terminal part of the shoot turns black and dies. Two or more generations develops per year. Larvae pupate partly in the galls, partly in the soil. Occurrence: very frequent (RUDOW 1875a, 1875b, RÜBSAAMEN 1890a, HIERONYMUS 1890, KÜSTER 1910, ROSS 1916, 1922d, HEDICKE 1917-1918, JAAP 1918, 1919-1920, 1924-1925, 1928, TOEPFER 1918, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, ZELLER 1941, WEIDNER & WEIDNER 1951, WEIDNER 1962, HUBER 1969b, HAASE & UTECH 1971, STELTER 1969c, 1982c, 1993, SCHRÖPPEL 1984, OSCHMANN 2000, STAUDT 2013). Distribution: Eurosiberian.

Rabdophaga triandraperda BARNES, 1935

Larvae develop in the outer layers of the wood on the stubs and the lower parts of the rods of the current year´s growth of *Salix triandra* L. (Salicaceae). Each larva develops in one chamber. Attacks are visible as „shot holes". Occurrence: very rare (BUHR 1965: # 6038, mentioned that galls are known from Germany without giving a locality). STELTER (1994a) included this species in his key but did give no information about German records. Distribution: European.

Rabdophaga vigemmae STELTER, 1989

Solitary larvae develop in side buds of the branches of *Salix viminalis* L. (Salicaceae). Type locality: Plau (Mecklenburg). Occurrence: very rare (STELTER 1989a). Distribution: European.

Rabdophaga viminalis (WESTWOOD, 1847)

Rhabdophaga perforans (KIEFFER, 1906)

Bright orange larvae develop under the bark of *Salix viminalis* L. (Salicaceae). Each larva develops in one chamber. Result of attack is visible as „shot holes". WESTWOOD (1847) described the species from *Salix viminalis* L. STELTER (1982a) redescribed it from *Salix repens* L., but this species may differ from Westwood's species. Occurrence: intermediate (STELTER 1980, 1982a, 1993, 1994a). Distribution: European.

Resseliella betulicola (KIEFFER, 1889)
Plemeliella betulicola (KIEFFER, 1889)
Yellowish-white larvae develop among youngest terminal leaves on the vegetative tip of *Betula pubescens* EHRH. and *B. pendula* ROTH (Betulaceae) in usually one generation per year. Occurrence: very frequent (RÜBSAAMEN 1890a, JAAP 1918, 1919-1920, 1924, ROSS 1922c, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, OSCHMANN 2000). Distribution: Eurosiberian.
Resseliella crassa (MÖHN, 1955)
Wichmanniella crassa MÖHN, 1955
Larvae develop in fresh resin of *Abies alba* MILL. (Pinaceae), each larva in a small tube. Occurrence: very rare (MÖHN 1955a, 1955c). Distribution: European.
Resseliella crataegi (BARNES, 1939)
Larvae develop under the bark of branches of *Crataegus laevigata* (POIRET) DC. (Rosaceae). Two generations develop per year. Larvae pupate in the soil. Occurrence: rare (KÜTHE & KRÄMER 1959: damage near Giessen). Distribution: European.
Resseliella oculiperda (RÜBSAAMEN, 1893)
Pink to red larvae live between bud grafts and the stock of cultivated *Rosa*-species and fruit trees, above all of *Pyrus communis* L. and *Malus domestica* BORKH. (Rosaceae). The larvae feed on the sap between the two layers of cambium. Two or three generations develop per year. Larvae pupate in the soil. It is evaluated as a locally serious pest, especially on apples and roses (DARVAS et al. 2000). Type locality: Sinzig a.d. Ahr. Occurrence: frequent (RÜBSAAMEN 1893, LÜSTNER 1931, MÖHN 1955a). Distribution: European.
Resseliella piceae SEITNER, 1906
Pink to reddish larvae develop gregariously inside young seed in cones of *Abies alba* MILL. (Pinaceae) without producing any visible malformation. RÜBSAAMEN & HEDICKE (1925-1939: 192) erraneously published *Picea abies* (L.) KARSTEN as host plant. The life cycle lasts two or three years. Seed including larvae fall to the soil and larvae pass the winter in fallen seed. Only a part of population pupates in the spring, most larvae enter the diapause, remain in the soil until the spring of the following year. At present it seems to be a minor pest in Europe; locally and occasionally it may cause serious harm (SKUHRAVÁ & ROQUES 2000). Occurrence: very rare (ESCHERICH 1942: without locality, POSTNER 1982). Distribution: European.
Resseliella quercivora (MAMAEV, 1965)
Profeltiella quercivora MAMAEV, 1965
Larvae cause cambium necroses and bark or timber damage to trunks of young oak trees and upper branches of older trees of oaks *Quercus robur* L., *Q. petraea* (MATT.) LIEBL. (Fagaceae) and some trees from other families. Females search for fresh bark injuries caused mainly by woodpeckers *Dendrocopus major* L. (Picidae, Piciformes, Aves), less by the dormouses *Glis glis* (L.) (Gliridae, Rodentia, Mammalia) and lay eggs in injured places. Larvae of *R. quercivora* (MAMAEV) feed off cambium sap. Several generations develop per year. Larvae pupate in the soil. Occurrence: very rare (DENGLER 2004). Distribution: European.
Resseliella theobaldi (BARNES, 1927)
Salmon-pink to red larvae live under the rind of stem of *Rubus idaeus* L. (Rosaceae). The rind of attacked parts is peeling off. Several generations develop per year. Full-grown larvae leave attacked parts and drop to the soil where they pupate. Occasionally it may be a serious pest of raspberry (DARVAS et al. 2000). Occurrence: intermediate (NOLTE 1952, FRITZSCHE 1957, 1958). Distribution: European.

Rhizomyia circumspinosa (RÜBSAAMEN, 1899)

Larvae live among leaf sheaths of *Carex* sp. (Cyperaceae). Occurrence: very rare (RÜBSAAMEN 1899c). Distribution: European.

Rhizomyia fasciata KIEFFER, 1904

Biology unknown, probable a xylophilous species. Occurrence: very rare (MEYER 1984: as *Rhizomyia* sp.1, MEYER & JASCHHOF 1999: as *Rhizomyia selecta* KIEFFER, 1904). Distribution: European.

Rhopalomyia artemisiae (BOUCHÉ, 1834) (Fig. 4B)

Orange coloured larvae cause large globular galls at the tip or in axils of *Artemisia campestris* L. and *A. scoparia* WALDST. & KIT. (Asteraceae). One or several chambers are inside one gall, each with only one larva. Pupation takes place in the gall. Several generations develop per year. Occurrence: very frequent (BOUCHÉ 1834, RUDOW 1875a, 1875b, BEUTHIN 1887, HIERONYMUS 1890, KRÖBER 1910, ROSS 1916, 1922c, 1922d, HEDICKE 1917a, JAAP 1918, 1924-1925, 1928, BUHR 1929, BENICK 1932, SCHLEICHER 1935, BERGER 1936, LANGE 1936, ZELLER 1940, 1941, WEIDNER & WEIDNER 1951, WEIDNER 1950, 1962, STELTER 1954, MÖHN 1955a, HUBER 1969b, HAASE & UTECH 1971, LUDWIG 1974, PICHINOT & MEYER 1998, BUHR H.J. 2005, KWAST 2012). Distribution: European, Submediterranean. The galls have been found also in Japan.

Rhopalomyia baccarum (WACHTL, 1883)

Orange larvae produce berry-shaped fleshy galls usually at the stem base of *Artemisia vulgaris* L. and *A. scoparia* WALDST. & KIT. (Asteraceae). Occurrence: frequent (JAAP 1918, ROSS 1922c, SCHLEICHER 1935, BROMM 1964, HAASE & UTECH 1971, PICHINOT & MEYER 1998, SCHMITZ 1998b, 1999). Distribution: Eurosiberian.

Rhopalomyia campestris (RÜBSAAMEN, 1915)

Misospatha campestris RÜBSAAMEN, 1915

Larvae cause leaf bud galls on *Artemisia campestris* L. (Asteraceae) that are similar to *Rhopalomyia artemisiae* (BOUCHÉ). Occurrence: frequent (RÜBSAAMEN 1915, JAAP 1918, SCHLEICHER 1935). Distribution: European.

Rhopalomyia chrysanthemi (AHLBERG, 1939)

Diarthronomyia chrysanthemi AHLBERG, 1939

Solitary larvae develop inside small galls occurring on leaves, stems, buds or flowerheads of commercial autumn chrysanthemums (*Chrysanthemum*) (Asteraceae). Several overlapping generations develop in one year. Larvae pupate in the gall. Primarily a glasshouse pest, but it may survive also in out-of-door conditions (BARNES 1948b). In is an alien species in Europe (SKUHRAVÁ et al. 2010). Occurrence: intermediate (BEHR 1949, BOLLOW 1955b, KRÖBER 1956). Distribution: widespread, origin probably Asia.

Rhopalomyia cristaegalli (KARSCH, 1877)

Several white larvae develop in swollen flower bud of *Rhinanthus minor* L. (Scrophulariaceae). Type locality: Finkenkrug near Berlin. Occurrence: very rare (KARSCH 1877). Distribution: European.

Rhopalomyia florum (Kieffer, 1890)

Solitary larvae develop in egg-shaped translucent galls between the florets in flower heads of *Artemisia vulgaris* L. (Asteraceae). Occurrence: very rare (SCHLEICHER 1935, MEYER 1984: reared from *Artemisia maritima* L., PICHINOT & MEYER 1998). Distribution: Eurosiberian.

Rhopalomyia foliorum (LOEW, 1850)

Dirty white larvae produce very small ovoid galls on the upperside of the leaves of *Artemisia vulgaris* L. (Asteraceae). Several generations develop per year. Larvae pupate in the gall and hibernate in the soil. Occurrence: frequent (KALTENBACH 1874, RUDOW 1875a,

1875b, JAAP 1928, SCHLEICHER 1935, MÖHN 1955a, SKUHRAVÁ & SKUHRAVÝ 1988, PICHINOT & MEYER 1998, SCHMITZ 1996, 1998b, 1999). Distribution: Eurosiberian.

Rhopalomyia hypogaea (F. LÖW, 1885)

Larvae produce unregularly rounded and fleshy galls on stems of *Leucanthemum atratum* (JACQ.) DC. (Asteraceae). The galls are usually situated on the boundary between the underground and overground parts of the stem. Several chambers are in one gall and only one larva develops in each chamber. Occurrence: frequent (JAAP 1919-1920, ROSS 1922c, BUHR 1930, SCHLEICHER 1935, HUBER 1969b, SCHRÖPPEL 1981). Distribution: European.

Rhopalomyia magnusi RÜBSAAMEN, 1893

Red larvae live in flower heads of *Artemisia vulgaris* L. and *A. campestris* L. (Asteraceae). Occurrence: rare (RÜBSAAMEN 1893, SCHLEICHER 1935). Distribution: European.

Rhopalomyia millefolii (LOEW, 1850)

Yellow larvae produce unilocular galls in flower heads and leaves, and axillary bud galls on stems of *Achillea millefolium* L. (Asteraceae). The galls are oval, fleshy, first green, then brown and glossy. Larvae pupate in the galls and hibernate in the soil. Several generations develop per year. Occurrence: very frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, 1924-1925, BUHR 1929, BENICK 1932, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, ZELLER 1940, WEIDNER & WEIDNER 1951, BROMM 1964, BUHR 1966, HAASE & UTECH 1971, MEYER 1984, PICHINOT & MEYER 1998, OSCHMANN 2000, STAUDT 2013). Distribution: Eurosiberian, immigrant to Egypt and India.

Rhopalomyia palearum (KIEFFER, 1890)

Larvae develop in swollen leaflets („palea") in flower heads of *Achillea ptarmica* L. (Asteraceae). Occurrence: intermediate (RÜBSAAMEN 1890a, LUDWIG 1935, BUHR 1966, PICHINOT & MEYER 1998). Distribution: European.

Rhopalomyia ptarmicae (VALLOT, 1849)

Cecidomyia floricola WINNERTZ, 1853

Whitish to orange coloured larvae cause galls in flower heads of *Achillea ptarmica* L. (Asteraceae). The inflorescence is changed into a spongy, irregular, round gall with many larval chambers, each chamber with only one larva. Two or three generations develop per year. Larvae pupate in the galls. Occurrence: very frequent (WINNERTZ 1853, RÜBSAAMEN 1890a, KRÖBER 1910, ROSS 1916, SCHULZE 1916b, HEDICKE 1917-1918, JAAP 1918, BUHR 1929, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, LANGE 1936, WEIDNER & WEIDNER 1951, WEIDNER 1962, BROMM 1964, HUBER 1969b, 1974, DREWECK 1980, MEYER 1984, SKUHRAVÁ & SKUHRAVÝ 1992a, STAUDT 2013). Distribution: European.

Rhopalomyia syngenesiae (LOEW, 1850)

Larvae live in the flower heads of *Matricaria perforata* MÉRAT (Asteraceae). Occurrence: intermediate (RÜBSAAMEN 1890a, LUDWIG 1935, SKUHRAVÁ & SKUHRAVÝ 1988). Distribution: European.

Rhopalomyia tanaceticola (KARSCH, 1879) (Fig. 4D)

Orange coloured larvae cause galls on axillary buds, on leaves, in axils of leaves and in flower heads of *Tanacetum vulgare* L. (Asteraceae). Several generations develop per year. Larvae pupate in the galls. Type locality: Westphalia. Occurrence: extremely frequent (KARSCH 1879, RÜBSAAMEN 1890a, SACK 1907, KRÖBER 1910, ROSS 1916, 1922c, JAAP 1923, 1924-1925, BUHR 1929, 1966, MARESQUELLE 1931, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER 1950, MÖHN 1955a, KLAUSNITZER 1967, 1968, 2008, PICHINOT & MEYER

1998, SCHMITZ 1998a, 1999, KRUSE 2009, LEHMANN 2007, LEHMANN & FLÜGEL 2012, KWAST 2012, STAUDT 2013). Distribution: Eurosiberian.

Rhopalomyia tubifex (BOUCHÉ, 1847)

White larvae produce tubular galls on leaf axils, stems and change into tubular galls the flower heads of *Artemisia campestris* L. (Asteraceae). Galls are 10–15 mm long. Each gall contains one larva. Two generations develop per year. Larvae pupate in the galls. Occurrence: frequent (RUDOW 1875a, 1875b, HIERONYMUS 1890, HEDICKE 1917-1918, ROSS 1922c, BUHR 1930, SCHLEICHER 1935, HAASE & UTECH 1971, PICHINOT & MEYER 1998). Distribution: Eurosiberian, Submediterranean.

Rondaniola bursaria (BREMI, 1847)

White larvae cause cylindrical galls on the upper surface of the leaves of *Glechoma hederacea* L. (Lamiaceae). The gall is densely covered with white hairs and contains only one larva. Two or more generations develop per year. Larvae pupate in the galls or in the soil. Occurrence: very frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, SACK 1907, KÜSTER 1910, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1929, 1966, BENICK 1932, LUDWIG 1935, SCHLEICHER 1935, BERGER 1936, ZELLER 1940, WEIDNER & WEIDNER 1951, MÖHN 1955a, HAASE & UTECH 1971, HUBER 1974, DREWECK 1980, SKUHRAVÁ & SKUHRAVÝ 1988, KWAST 2012, STAUDT 2013). Distribution: European.

Sackenomyia reaumurii (BREMI, 1847)

Oligotrophus solmsi KIEFFER, 1906; *Phlyctidobia solmsi* (KIEFFER, 1906)

Solitary larvae develop in blister galls on leaves of *Viburnum lantana* L. (Caprifoliaceae) in one generation per year. Larvae pupate in the soil. Occurrence: very frequent (V. SCHLECHTENDAL 1883, HIERONYMUS 1890, ROSS 1916, TOEPFER 1918, JAAP 1919-1920, 1924-1925, WEIDNER & WEIDNER 1951, MÖHN 1955a, KÜHLHORN 1957, HUBER 1969b, 1974, LUDWIG 1974, KLEMENT & ESCHELMÜLLER 1978, SCHRÖPPEL 1984, KRUSE 2009, KWAST 2012, BUHR H.J. 2013, STAUDT 2013). Distribution: European.

Schizomyia galiorum KIEFFER, 1889

Dirty yellow larvae develop in flower bud galls of *Galium mollugo* L., *Galium verum* L. and other *Galium*-species (Rubiaceae). Inside galled flower bud is a chamber with one, two or three larvae. Full-grown larvae leave the gall and pupate in the soil. Two generations develop per year. Occurrence: extremely frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, HEDICKE 1917-1918, ROSS 1914, 1916, 1922c, JAAP 1923, BUHR 1929, 1939, 1960, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, WEIDNER 1950, WEIDNER & WEIDNER 1951, MÖHN 1955a, HUBER 1969b, HAASE & UTECH 1971, DREWECK 1980, SCHRÖPPEL 1982, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, 1992b, UTECH 1988a, 1988b). Distribution: Eurosiberian.

Semudobia betulae (WINNERTZ, 1853)

Solitary orange larvae develop in swollen fruits of *Betula pubescens* EHRH. and *B. pendula* ROTH (Betulaceae). The attacked seed is swollen with a small window-pit (for future emergence) and reduced fruit wings. One generation develops per year. Larvae hibernate in the gall where they pupate in the spring. Occurrence: very frequent (WINNERTZ 1853, RÜBSAAMEN 1889a, 1890a, 1891c, SACK 1907, KRÖBER 1910, GEISENHEYNER 1913, ROSS 1916, HEDICKE 1917-1918, JAAP 1918, BUHR 1930, 1966, LUDWIG 1935, SCHLEICHER 1935, NIESSEN 1937, MÖHN 1955a, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, KWAST 2012). Distribution: Eurosiberian, immigrant to North America.

Semudobia skuhravae ROSKAM, 1977

Solitary larvae cause small galls which are joined to the spindle of catkins of *Betula pendula* L. (Betulaceae). The life cycle is similar to the cycle of *Semudobia betulae* (WINNERTZ).

Occurrence: rare (SKUHRAVÁ & SKUHRAVÝ 1988, BUHR H.J. 2013). Distribution: Euro-Siberian and Holarctic.

Semudobia tarda ROSKAM, 1977

Solitary orange larvae develop in swollen fruits of *Betula pendula* ROTH and *B. pubescens* EHRH. (Betulaceae). The fruit is button-like swollen and fruit wings are completely or nearly completely reduced with a rather indistinct window-pit. The life cycle is similar to that of *Semudobia betulae* (WINNERTZ). Occurrence: rare (ROSKAM 1977, BUHR H.J. 2013). ROSKAM (1977) stated the occurrence of *Semudobia tarda* in Germany. The locality is Winterberg, Hoch Sauerland Kreis (Roskam pers. comm.). Distribution: Euro-Siberian, immigrant to North America.

Silvestriola minima (RÜBSAAMEN, 1891)

Biology unknown. RÜBSAAMEN (1891e) caught a male at the end of August. Type locality: Siegen. Occurrence: very rare. Distribution: European.

Sitodiplosis cambriensis JONES, 1940

Larvae develop in inflorescences of *Poa trivialis* L. (Poaceae). They may cause a loss of seed. Occurrence: frequent (SCHOBER 1959: reared from *Poa pratensis* L). Distribution: European.

Sitodiplosis mosellana (GÉHIN, 1857)

Diplosis aurantiaca WAGNER, 1866

One or several orange larvae feed on the developing grains in the ears of *Triticum aestivum* L. and *Hordeum vulgare* L. (Poaceae). They cause a loss of seed. One generation develops per year. Larvae hibernate and pupate in the soil. At present it is a minor pest, but in the past it was a serious pest in Germany, England and Sweden (DARVAS et al. 2000, SKUHRAVÁ et al.1984a, 1984b). Occurrence: very frequent (WAGNER 1866, SCHLEICHER 1935, HEINZE 1955, BASEDOW 1971, 1972, 1977, LÜBKE & WETZEL 1984, GAAFAR et al. 2011a, 2011b, LEHMHUS & HEIMBACH 2012). Distribution: Palaearctic up to China and Japan and also Nearctic.

Spurgia esulae GAGNÉ, 1990

Larvae cause green rosette galls on *Euphorbia esula* L. (Euphorbiaceae). Full-grown larvae form cocoons among the leaves of the gall. Occurrence: very rare (HIERONYMUS 1890: as *Cecidomyia euphorbiae* LOEW). Distribution: European, introduced in USA (GAGNÉ 1990, GAGNÉ & JASCHHOF 2014).

Spurgia euphorbiae (VALLOT, 1827)

Cecidomyia capitigena BREMI, 1847; *Cecidomyia euphorbiae* LOEW, 1850; *Cecidomyia subpatula* BREMI, 1847

Orange coloured larvae live gregariously in globular, usually reddish coloured galls on vegetative tips of *Euphorbia cyparissias* L. (Euphorbiaceae). The gall consists of many deformed and shortened leaves. Several generations develop per year. Larvae pupate in cocoons in the galls and hibernate in the soil. Occurrence: extremely frequent (HIERONYMUS 1890, SCHULZE 1916a, ROSS 1916, 1922c, 1922d, HEDICKE 1917-1918, JAAP 1923, 1924-1925, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, ZELLER 1940, 1941, 1942, WEIDNER & WEIDNER 1951, BUHR 1929, 1930, 1966, HUBER 1969b, HAASE & UTECH 1971, SCHRÖPPEL 1981, SKUHRAVÁ & SKUHRAVÝ 1988, UTECH 1988a, 1988b, OSCHMANN 2000, KWAST 2012). Distribution: European, immigrant with introduced stock of *Spurgia esulae* GAGNÉ in Canada and USA (North Dakota) (GAGNÉ 2004, GAGNÉ & JASCHHOF 2014).

Stenodiplosis bromicola (MARIKOVSKIJ & AGAFONOVA, 1961) (Fig. 4C)

Contarinia bromicola MARIKOVSKIJ & AGAFONOVA, 1961

Solitary larvae develop in seeds of *Bromus inermis* LEYSSER (Poaceae) in one or two generations per year. Larvae pupate in the soil. Locally this species may be a serious pest of

seed plantations. Occurrence: very rare (MEYER 1984: reared from *Bromus hordeaceus* L.). Distribution: European, immigrant to Canada and USA (GAGNÉ 2004, GAGNÉ & JASCHHOF 2014).

Stenodiplosis geniculati (REUTER, 1895)

Solitary pink larvae develop in inflorescences of *Alopecurus geniculatus* L. and *A. pratensis* L. (Poaceae). It may be a pest. Larvae prevent seed formation. Usually only one generation develops per year. Larvae hibernate on the host plant. Occurrence: frequent (MÖHN 1955a, GREILER & TSCHARNTKE 1990, GREILER 1994: reared adults from *Alopecurus myosuroides* HUDS., PICHINOT & MEYER 1998). Distribution: European, immigrant to Canada, USA, New Zealand (GAGNÉ 2004, GAGNÉ & JASCHHOF 2014).

Sterrhaulus corneolus (RÜBSAAMEN, 1899)

Larvae live among leaf sheaths of *Carex* sp. (Cyperaceae). Occurrence: rare (RÜBSAAMEN 1899c, JAAP 1918, MÖHN 1955a). Distribution: European.

Stomatosema kamali (GROVER, 1961)

Biology unknown. Adults were caught. Occurrence: very rare (MEYER 1984). Distribution: Euroasian.

Taxomyia taxi (INCHBALD, 1861)

Solitary orange red larvae cause artichoke-shaped galls on the shoots of *Taxus baccata* L. (Taxaceae). The development lasts usually two years. The gall develops in the second year of its life cycle. Larvae pupate in the gall. Occurrence: very frequent (HIERONYMUS 1890, ROSS 1916, BUSSE 1918, JAAP 1924-1925, BUHR 1929, SCHLEICHER 1935, NIESSEN 1937, POSTNER 1982, SCHMITZ 1999). Distribution: European, occurring up to Caucasus.

Thecodiplosis brachyntera (SCHWÄGRICHEN, 1835)

One to five orange red larvae cause galls at the base of the pair of needles of *Pinus sylvestris* L. and other species of the genus *Pinus* (Pinaceae). Type locality: Leipzig. Attacked pine needles are abnormally short and discoloured. One generation develops per year. Pupation takes place either in galls or in the soil. It is a major pest of pine in Central Europe. Several outbreaks were observed during the 19th and 20th centuries (SKUHRAVÁ & ROQUES, 2000, SKUHRAVÝ 1991). Occurrence: very frequent (SCHWÄGRICHEN 1835, SACK 1907, HEDICKE 1917-1918, JAAP 1918, ECKSTEIN 1925, BUHR 1930, 1966, TUBEUF 1932, SCHLEICHER 1935, MÖHN 1955a, KRÖBER 1956, FANKHÄNEL 1962, HAASE & UTECH 1971, POSTNER 1982). Distribution: Eurosiberian.

Thurauia aquatica RÜBSAAMEN, 1899

Orange red larvae develop under the leaf sheaths of *Carex appropinquata* SCHUM. (Cyperaceae), partially submerged in water. Larvae spin cocoons in which they hibernate and pupate in the spring. One generation develops per year. Type locality: Berlin. Occurrence: intermediate (RÜBSAAMEN 1899b, 1899c, HEDICKE 1917-1918, MÖHN 1955a, MEYER 1984). Distribution: European.

Thurauia uliginosa RÜBSAAMEN, 1899

Red larvae develop under the leaf sheaths of *Carex* sp. (Cyperaceae). Type locality: Berlin. Occurrence: very rare (RÜBSAAMEN 1899b). Distribution: European.

Tricholaba similis RÜBSAAMEN, 1917

Yellow red larvae live as inquilines in leaf galls of the gall midge *Dasineura viciae* (KIEFFER) on *Vicia* sp. (Fabaceae). Occurrence: frequent (RÜBSAAMEN 1917, JAAP 1918, MÖHN 1955a). Distribution: Eurosiberian.

Tricholaba trifolii RÜBSAAMEN, 1917

Tricholaba barnesi MILNE, 1960

Whitish yellow larvae live as inquilines in leaf galls of the gall midge *Dasineura trifolii* (F. LÖW) on *Trifolium repens* L. (Fabaceae). Occurrence: very frequent (RÜBSAAMEN 1917, JAAP

1918, 1919-1920, 1924-1925, BUHR 1929, 1966, LUDWIG 1935, NIESSEN 1938, MÖHN 1955a, STELTER 1963, 1988b, MEYER 1984). Distribution: Eurosiberian.

Tricholaba viciarum STELTER, 1963

Yellow or yellow-orange coloured larvae develop in folded leaflets of *Vicia cracca* L. (Fabaceae). Type locality: Groß Lüsewitz (Rostock). Occurrence: rare (STELTER 1963, 1988b, 1992a). Distribution: European.

Tricholaba viciobia STELTER, 1988

White to yellow larvae develop in folded leaflets of *Vicia sylvatica* L. (Fabaceae). Type locality: Mühlhausen (Thuringia). Occurrence: very rare (STELTER 1988b). Distribution: European, Germany.

Trisopsis abdominalis MAMAEV, 1961

Larvae develop in rotten woody matter produced by *Laetiporus sulphureus* (BULL.) MURRILL. (Fungi: Fomitopsidaceae) on *Quercus* sp. (Fagaceae). Occurrence: rare (MAMAEV & MOHRIG 1974: in litter). Distribution: Eurosiberian up to Uzbekistan.

Trisopsis globularis MAMAEV, 1961

Biology unknown. A male was caught. Occurrence: very rare (SKUHRAVÁ in WEBER 1995). Distribution: European.

Trisopsis punctiventris MAMAEV, 1961

Biology unknown. Adults were caught. Occurrence: very rare (MEYER 1984). Distribution: European, Uzbekistan.

Trotteria galii RÜBSAAMEN, 1912

Pink larvae live as inquilines in galls of the gall midge *Schizomyia galiorum* KIEFFER on *Galium mollugo* L. (Rubiaceae). Usually two generations develop per year. Type locality: Remagen. Occurrence: frequent (RÜBSAAMEN 1912, HEDICKE 1917-1918, MÖHN 1955a, OSCHMANN 2000). Distribution: European.

Trotteria obtusa (LOEW, 1845)

Lasioptera sarothamni KIEFFER, 1890; *Trotteria lathyri* RÜBSAAMEN, 1915; *Trotteria genistae* MÖHN, 1966; *Trotteria scoparii* MÖHN, 1966

Larvae live as inquilines in galls caused by various species of the gall midge genus *Asphondylia* on host plant species and genera of the family Fabaceae (SKUHRAVÁ 1989). Occurrence: frequent (LOEW 1845, RÜBSAAMEN 1915, MÖHN 1966-1971). Distribution: European.

Trotteria umbelliferarum KIEFFER, 1902

Trotteria inquilina RÜBSAAMEN, 1921

Pink larvae live as inquilines in fruit galls of the gall midge *Kiefferia pericarpiicola* (BREMI) on *Pimpinella saxifraga* L. (Apiaceae). Occurrence: very rare (RÜBSAAMEN 1921, MÖHN 1966-1971). Distribution: Eurosiberian.

Vitisiella oenephila (HAIMHOFFEN, 1875)

Janetiella oenephila (HAIMHOFFEN, 1875)

Solitary orange to salmon pink larvae cause galls on leaves of *Vitis vinifera* L. (Vitaceae). The hard galls are round or oval and visible on both sides of the leaves. One generation develops per year. Larvae hibernate in the soil. Occurrence: very rare (RÜBSAAMEN 1906). Distribution: European, Mediterranean.

Wachtliella caricis (LOEW, 1850)

Cecidomyia riparia WINNERTZ, 1853; *Cecidomyia muricatae* MEADE, 1886

Solitary orange larvae develop in swollen fruits (utricles) in inflorescences of *Carex riparia* CURTIS and *C. muricata* L. (Cyperaceae). Larvae pupate in white cocoons in the galls. One generation develops per year. Occurrence: frequent (WINNERTZ 1853, HIERONYMUS 1890, RÜBSAAMEN 1915, ROSS 1916, 1922c, HEDICKE 1917-1918, JAAP 1918, 1928, BUHR 1930,

LUDWIG 1935, SCHLEICHER 1935, NIESSEN 1937, WEIDNER & WEIDNER 1951, WEIDNER 1962, HUBER 1969b, 1974). Distribution: European, North African.

Wachtliella ericina (F. LÖW, 1885)

Orange-reddish larvae produce small rosette galls on the growing tips of *Erica herbacea* L. (Ericaceae). Occurrence: frequent (HIERONYMUS 1890, ROSS 1916, 1922c, JAAP 1919-1920, SCHLEICHER 1935, LANGE 1936, SCHRÖPPEL 1981). Distribution: European, Submediterranean, Subatlantic.

Wachtliella krumbholzi STELTER, 1975

Orange larvae live inside the fruits of *Rhamnus cathartica* L. (Rhamnaceae). Type locality: Groß Lüsewitz. Occurrence: very rare (v. SCHLECHTENDAL 1895, STELTER 1975a). Distribution: European.

Wachtliella niebleri RÜBSAAMEN, 1915

Orange-yellow larvae develop in folded leaflets of *Cytisus nigricans* L. (Fabaceae). Type locality: Amberg, Nürnberg. Occurrence: very rare (RÜBSAAMEN 1915, ROSS 1916), Distribution: Eurosiberian.

Wachtliella persicariae (LINNAEUS, 1767) (cover: photo)

Whitish-orange larvae produce galls in the form of rolled leaf margin on *Polygonum amphibium* L. (Polygonaceae). Each gall contains several larvae. Larvae pupate in white cocoons within the galls. Several generations develop per year. Occurrence: very frequent (HIERONYMUS 1890, ROSS 1916, 1922d, HEDICKE 1917-1918, ROSS 1922c, JAAP 1918, 1928, BUHR 1929, 1939, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, LANGE 1936, NIESSEN 1937, ZELLER 1940, 1941, WEIDNER & WEIDNER 1951, MÖHN 1955a, WEIDNER 1962, HUBER 1969b, 1974, HAASE & UTECH 1971, SKUHRAVÁ & SKUHRAVÝ 1992a, LEHMANN & FLÜGEL 2012, KWAST 2012). Distribution: European, including Caucasus.

Wachtliella stachydis (BREMI, 1847)

Perrisia granulata KIEFFER, 1909

Orange coloured larvae live gregariously in swollen leaf and flower buds of *Stachys sylvatica* L. (Lamiaceae). Two generations per year. Larvae of summer generation pupate in the galls, larvae of hibernating generation pupate in the soil. Occurrence: very frequent (HIERONYMUS 1890, KIEFFER 1909, ROSS 1916, 1922d, HEDICKE 1917-1918, JAAP 1919-1920, 1923, 1924-1925, BUHR 1929, 1966, LUDWIG 1935, SCHLEICHER 1935, LANGE 1936, ZELLER 1940, 1942, WEIDNER & WEIDNER 1951, KÜHLHORN 1957, HUBER 1969b, SCHRÖPPEL 1984, PICHINOT & MEYER 1998). Distribution: European.

Xenodiplosis laeviusculi (RÜBSAAMEN, 1910)

Red larvae live as inquilines under the galls of gall wasp *Neuroterus albipes* (SCHENCK, 1863) (Hymenoptera: Cynipidae) on the leaves of *Quercus robur* L. (Fagaceae). Type locality: Berlin. Occurrence: rare (RÜBSAAMEN 1910). Distribution: European.

Xylodiplosis nigritarsis (ZETTERSTEDT, 1850)

Xylodiplosis praecox WINNERTZ, 1853

Red larvae develop inside the xylem vessels of freshly cut wood of *Quercus robur* L. and *Q. petraea* (MATT.) LIEBL. (Fagaceae). Adults fly in oak forests from March to November and females search for freshly cut trunks for oviposition. Several overlapping generations develop during one year. Occurrence: intermediate (SKUHRAVÁ et al. 1998, SKUHRAVÁ & DENGLER 2001). Distribution: European.

Zeuxidiplosis giardi (KIEFFER, 1896)

Reddish larvae cause leaf bud galls on *Hypericum perforatum* L. (Hypericaceae). The leaf pair at the vegetative tip or in stem axils forms a globular gall with large chamber inside where one or two larvae develop and pupate. Two generations develop per year. This species is used for biological control of the weed *Hypericum perforatum* L. in North Amer-

ica, Australia and New Zealand. Occurrence: intermediate (KÜHLHORN 1957). Distribution: European, introduced to USA (California), Australia, New Zealand, immigrant to South Africa (GAGNÉ 2004, GAGNÉ & JASCHHOF 2014).

Zygiobia carpini (F. LÖW, 1874)

White larvae produce swellings along the median vein and side veins of the leaves of *Carpinus betulus* L. (Corylaceae). Each swelling contains one larva. In autumn the larvae leave galls and hibernate in the soil. One generation develops per year. Occurrence: extremely frequent (RÜBSAAMEN 1890a, HIERONYMUS 1890, v. SCHLECHTENDAL 1883, ROSS 1916, 1922c, Hedicke 1917-1918, JAAP 1918, 1919-1920, 1923, 1928, BUHR 1929, MARESQUELLE 1931, BENICK 1932, SCHLEICHER 1935, LUDWIG 1935, BERGER 1936, REIMERS 1942, ZELLER 1941, 1942, WEIDNER & WEIDNER 1951, MÖHN 1955a, BUHR 1966, HUBER 1969b, UTECH 1988a, 1988b, SKUHRAVÁ & SKUHRAVÝ 1988, 1992a, STELTER 1992e, PICHINOT & MEYER 1998, OSCHMANN 2000, KWAST 2012, STAUDT 2013). Distribution: European up to Turkey.

Zygiobia ruebsaameni STELTER, 1992

Larvae live as inquilines in leaf galls of the gall midge *Aschistonyx carpinicolus* RÜBS. on *Carpinus betulus* L. (Corylaceae). Type locality: Tessin, Rostock. Occurrence: very rare (STELTER 1992e). Distribution: European.

5.2 Number of species and species densities

In total, 686 species of the subfamily Cecidomyiinae are recorded for Germany. The majority of them are phytophagous (597: 87.0 %) and associated with living plant tissues. Their larvae induce galls (535: 78.0 %), some live free in or on host plants without causing galls (12: 1.7 %), or as inquilines (50: 7.3 %) in galls of other gall midges or other gall producing insects. They are associated with 509 species of host plants belonging to 218 genera of 56 families. About 34 species (5.0 %) are zoophagous. Their larvae feed on other small athropods, especially insects and mites. They belong mainly to the genera *Aphidoletes, Arthrocnodax, Endopsylla, Feltiella* and *Lestodiplosis*. About 23 species (3.4 %) are mycophagous. Their larvae are associated with higher fungi, rusts and powdery mildews. They belong mainly to the genera *Brachyneura, Buhromyiella, Camptodiplosis, Mycocecis, Mycodiplosis, Neoisodiplosis,* and *Neomycodiplosis*. The biology of about 35 species (5.1 %) is unknown. Their adults were caught in the field or reared from soil samples. These include species belonging mainly to the genera *Bremia, Coquillettomyia, Didayctylomyia, Holobremia, Hyperdiplosis, Karshomyia, Rhizomyia* and *Trisopsis*.

The German gall midge fauna is rich in species possibly due to the fact that this country is one of the best explored in Europe. At present, Germany with 686 species is the country with the highest number of species in Europe, followed by France (581), Czech Republic (564), United Kingdom (526), Italy (471), European part of Russia (400), Poland (397), Slovakia (355) and Austria (352). The remaining European countries each have less than 350 species of Cecidomyiinae (SKUHRAVÁ & SKUHRAVÝ 2010a). In comparision with Germany, the lower species richness of the other countries can be partly consequence of their smaller area, geographic position or lower number of researchers.

Species richness of gall midges in different federal states of Germany is given in Table 2. Brandenburg (together with Berlin) with 358 has the highest number of species, followed by Bavaria with 328 species, Schleswig-Holstein (together with Hamburg) with 297 species and Mecklenburg-Western Pomerania with 286 species.

Table 2: Numbers of species and species densities in the different German federal states (state areas according to HAGENKORT-RIEGER 2012)

German federal state	Abbreviation	Area (km²)	Number of species	Species density
Bavaria	BA	70 550.11	328	113
Brandenburg & Berlin	BB	30 370.83	358	155
Baden-Württemberg	BW	35 751.48	139	58
Hesse	HE	21 114.91	207	71
Lower Saxony & Bremen	LS	48 032.12	117	45
Mecklenburg-Western Pomerania	MP	23 190.76	286	129
North Rhine-Westphalia	NW	34 092.25	251	104
Rhineland-Palatinate	RP	19 854.06	157	75
Schleswig-Holstein & Hamburg	SH	16 554.41	297	148
Saarland	SL	2 568.75	83	69
Saxony-Anhalt	ST	20 449.54	206	98
Saxony	SY	18 419.71	225	107
Thuringia	TH	16 172.50	266	133
Germany: all federal states	G	357 121.43	686	160

The most species rich genera are *Dasineura* with 149 and *Contarinia* with 97 species (Table 3). They make up 36 % of all species in Germany and nearly 31 % of those occurring in Europe. The 39 German species of *Rabdophaga* represent nearly all the species known from Europe. Less than 35 species are found in other gall midge genera in Germany, e.g. *Macrolabis* with 32 species and *Jaapiella* with 29 species. It is likely that *Asphondylia* requires a warmer climate than the German one, because only 19 species occur in Germany, but 29 in France with warmer climate.

In total, 12 genera have more than 14 species in Germany and account for 476 (69.4 %) species. Other genera are less species rich, e.g. 8 species of *Clinodiplosis*, 7 species of *Arthrocnodax* and *Resseliella*, 6 species of *Coquillettomyia, Cystiphora* and *Wachtliella*, 5 species of *Harmandiola*, 4 species of *Ametrodiplosis, Aphidoletes, Arnoldiola, Bayeriola, Geocrypta, Janetiella, Oligotrophus, Ozirhincus, Tricholaba*, 3 species of *Brachineura, Janetia, Semudobia, Trisopsis, Trotteria*, 2 species in 24 genera and only one species of each of the remaining 66 genera.

Differences in species richnes of genera mainly depend on the intensity gall midges have been studied, the number of researchers and collectors of galls and their experience, and the size of the area studied (SKUHRAVÁ & SKUHRAVÝ 2010a).

Brandenburg/Berlin shows the highest species densities of gall midges in the federal states of Germany with 155 species/1000 km² (Table 2). For total Germany 160 species/1000 km² is calculated. Of the 50 countries in Europe, Germany with 160 species is second (SKUHRAVÁ & SKUHRAVÝ 2010a). The higher species density of 189 species per 1000 km², recorded in the Czech Republic, is because the fauna of that country has been more intensively studied (SKUHRAVÁ 1994a, 1994b, SKUHRAVÁ & SKUHRAVÝ 2010a).

Table 3: Comparison of the numbers of species in the main genera recorded in Germany, three adjacent countries and Europe.

Genus / Number of species	Germany	Poland	France	Austria	Europe
Dasineura RONDANI, 1840	149	89	130	91	230
Contarinia RONDANI, 1860	97	58	82	56	135
Rabdophaga WESTWOOD, 1847	39	24	21	13	40
Macrolabis KIEFFER, 1892	32	13	17	13	35
Jaapiella RÜBSAAMEN, 1915	29	20	19	19	35
Lestodiplosis KIEFFER, 1894	25	8	32	3	90
Mayetiola KIEFFER, 1896	21	7	11	3	28
Lasioptera MEIGEN, 1818	20	9	11	9	27
Asphondylia LOEW, 1850	19	13	29	16	50
Mycodiplosis RÜBSAAMEN, 1895	15	3	6	6	21
Planetella WESTWOOD, 1840	15	8	8	3	22
Rhopalomyia RÜBSAAMEN, 1892	15	11	13	8	38
Species of dominant genera (n)	476	263	379	240	751
Species of dominant genera (%)	69.4	66.2	65.2	68.2	64.1
Species of all genera (n)	686	397	581	352	1171

5.3 Frequency of occurrence

In total, 65.6 % of the species (450) occur in 1 to 4 federal states (Fig. 5) and only 2.8 % (19) were recorded in all federal states, which is similar as in other European countries (SKUHRAVÁ 1994a, 1994b, SKUHRAVÁ et al. 2005, 2006, 2008, SKUHRAVÁ & SKUHRAVÝ 2010a). The following frequency groups were differentiated:

a) The very rare (from only 1 federal state)

Group includes 188 species that represent 27.4 % of all German species. Most of these species were included based on the work of Schrank, Meigen and Winnertz in the 19th century. Some of them have not been found since that time, e.g. *Lestodiplosis flaveolata* and *Bremia cilipes*. The original material is lost, the adults are poorly described and the species can not be identified by the description. It is interesting that *Resseliella piceae*, a pest of *Abies alba*, is known to occur only in Bavaria. *Dasineura thomasi* inducing galls on *Campanula cochleariifolia* and *Jaapiella alpina* galls on *Silene acaulis* are very rare species that were found only once in Bavaria.

b) The rare (in 2 federal states)

Group includes 121 species (17.6 %). *Lasioptera hungarica*, delevoping in stems of *Phragmites australis*, is only known from Brandenburg and Baden-Württemberg.

c) The intermediate (in 3 federal states)

Group includes 79 species (11.5 %). Some of them are associated with trees, e.g. *Contarinia marchali* on *Fraxinus excelsior*. Some species, e.g. *Asphondylia baudysi*, produce galls on pods of *Coronilla varia*, found in Bavaria, North Rhine-Westphalia and Saxony-Anhalt at single localities and seem to be more common in Slovakia with 12 and the Czech Republic with 51 localities.

d) The frequent (in 4 – 7 federal states)

Group includes 153 species (22.3 %). Many of them are associated with trees and shrubs: *Kaltenbachiola strobi* and *Plemeliella abietina* with *Picea abies*, *Contarinia baeri* with *Pinus sylvestris*, *Dasineura kellneri* with *Larix decidua*, *Dasineura fraxinea* with *Fraxinus excelsior*,

Contarinia quercina with *Quercus robur* and *Oligotrophus juniperinus* with *Juniperus communis*.

e) The very frequent (in 8 – 11 federal states)

Group includes 102 species (14.9 %) that are also mostly associated with trees and shrubs: *Thecodiplosis brachyntera* with *Pinus sylvestris*, *Taxomyia taxi* with *Taxus baccata*, *Acericecis vitrina* and *Drisina glutinosa* with *Acer pseudoplatanus*, *Anisostephus betulinus*, *Massalongia rubra* and *Semudobia betulae* with *Betula*, *Dasineura thomasiana* and *D. tiliae* with *Tilia*, *Aschistonyx carpinicolus* with *Carpinus betulus* and *Craneiobia corni* with *Cornus sanguinea*.

f) The extremely frequent (in 12 - 13 federal states)

Group includes 43 species (6.3 %) and are also mostly associated with trees and shrubs. *Macrodiplosis pustularis* and *M. roboris* with *Quercus robur* and *Q. petraea*, *Contarinia tiliarum* and *Didymomyia tiliacea* with *Tilia platyphyllos* and *T. cordata*, *Zygiobia carpini* with *Carpinus betulus*, *Iteomyia capreae* and *Rabdophaga rosaria* with various species of *Salix*, *Dasineura rosae* with *Rosa canina* and other species of *Rosa*, *Dasineura plicatrix* and *Lasioptera rubi* with *Rubus* spp. *Macrodiplosis pustularis*, *M. roboris* and *Dasineura rosae* inducing galls on leaves of *Quercus* and *Rosa*, respectively, are very frequent in Germany. The first two species are also frequent in Poland, whereas the last species is the most frequent species in France.

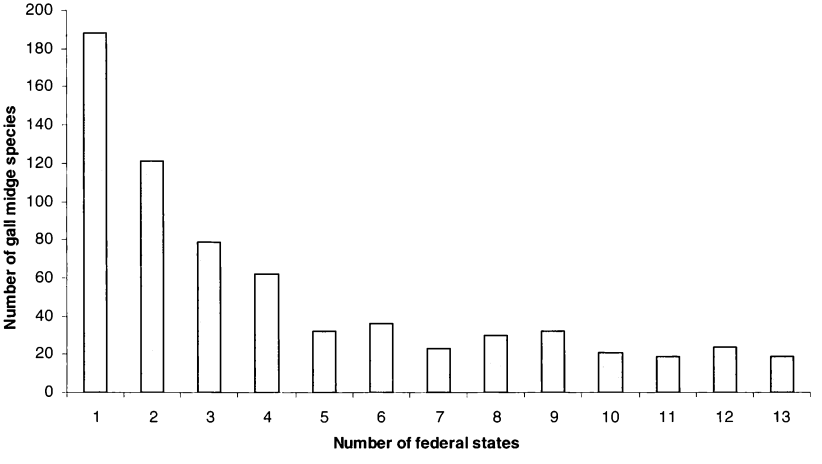

Fig. 5: Frequency of gall midge species according to their occurrence in German federal states.

The frequency of *Lasioptera rubi*, occurring abundantly in Central Europe, decreases from the north to the south (SKUHRAVÁ et al. 2005, 2006). In Germany it occurs very frequently throughout the whole country. In adjacent areas, e.g. Poland, it mainly occurs in the southern parts. In the Czech Republic more records were in the past than currently (SKUHRAVÁ, 1994a, 1994b).

Mikiola fagi and *Hartigiola annulipes*, both of which induce galls on leaves of *Fagus sylvatica*, are the most frequent species in Germany. Their galls were found in all 13 federal states in Germany.

Each part of Europe is characterised by different frequency groups (SKUHRAVÁ & SKUHRAVÝ 2010a). The most frequent European species is *Jaapiella veronicae* producing galls on leaf buds of *Veronica chamaedrys*. Its galls were found in all 13 German federal

states. *Mikiola fagi* is very frequent in Germany and similarly frequent in Denmark (SKUHRAVÁ et al. 2006). *Iteomyia capreae* occurs very frequently in Germany and in Northern Europe, e.g. Norway (SKUHRAVÁ & SKUHRAVÝ 2012).

5.4 Altitudinal distribution

The composition of vegetation, including the number of host plants for phytophagous gall midges, changes with increasing altitude (SKUHRAVÁ & SKUHRAVÝ 2009, 2010b). This change is most dramatic above the tree line (so-called timber line). There are very few trees and mainly various grasses, herbaceous plants and dwarf shrubs, e.g. *Vaccinium* spp., *Calluna vulgaris* and dwarf *Salix* spp. The number of species of gall midges therefore decreases with increase in altitude.

In the Bavarian Swabia the lowest point is at Neuburg a.d. Donau (383 m a.s.l.) and the highest point is mount Schochen (2100 m a.s.l.) in the Allgäu Alps. The tree line in the Allgäu Alps is at about 1500 meters. Of the 168 species of gall midges found in Swabia, the majority - 106 species - occurs in the colline zone, 87 in the submontane and 60 in the montane zone. Only a few - 14 species each – occur in the subalpine zone and the alpine zone, respectively.

Most of the gall midges - 100 species - occur in narrow altitudinal spans of one zone, 40 species in two, 16 species in three, 7 species in four and 5 species in five zones (Table 4).

The following eight species of gall midges occur at localities in a relative wide altitudinal range from the colline zone, via the submontane, montane and subalpine zones, and reaching up to the alpine zone: *Dasineura galiicola, D. phyteumatis, D. rosae, Geocrypta galii, Iteomyia capreae, Jaapiella veronicae, Rabdophaga salicis* and *Sackenomyia reaumurii*. Most of them belong to abundant and wide-spread species not only in Bavaria and Germany but also Central Europe.

The distribution of one of these species - *Sackenomyia reaumurii* - is very interesting, both from the geographical and altitudinal points of view. The larvae cause conspicuous red coloured pustule galls on leaves of *Viburnum lantana*. This species and its host plant occurs abundantly in south-eastern Germany, Austria, Switzerland, southeastern France, northern Italy, Hungary, Czech Republic and Slovakia. No galls were found in Poland and only a few galls at single localities in Romania, Bulgaria and Ukraine (Fig. 6A). Galls of *S. reaumurii* were found between 190 - 550 m in the Czech Republic, 190 - 900 m in Austria, 190 - 1186 m in Slovakia, 250 - 1370 m in northern Italy and 450 -> 1700 m a.s.l. in southern Germany. In the Allgäu Alps, it occurs at altitudes between 790 and over 1700 m a.s.l. (HUBER 1974, SCHRÖPPEL 1984). This species is in the red list of threatened species in the Czech Republic because its occurrence has greatly decreased over the last fourty years (SKUHRAVÁ 1991, 1994a, 1994b, 2005, SKUHRAVÁ & SKUHRAVÝ 2009, 2010b).

The different altitudinal zones in Bavarian Swabia are characterised by the following species of gall midges:

- The colline zone (200-500 m): *Aschistonyx carpinicolus* and *Zygiobia carpini* associated with *Carpinus betulus*.
- The submontane zone (501-900 m): *Macrodiplosis pustularis* and *M. roboris*, associated with *Quercus robur* and *Q. petraea*.
- The montane zone (901-1500 m): *Acericecis vitrina* and *Dasineura irregularis* associated with *Acer pseudoplatanus*. Both species were found at altitudes of 1200 m a.s.l. in the Allgäu Alps.

Table 4: Altitudinal distribution of gall midges in Bavarian Swabia.

Altitude-zone [in m a.s.l.]	Colline: 200-500	Submontane: 501-900	Montane: 901-1500	Subalpine: 1501-1700	Alpine: 1701 - 2400	Total zones
Acericecis vitrina	+	+	+	.	.	3
Ametrodiplosis crassinerva	+	.	.	.	.	1
Anisostephus betulinus	.	.	+	.	.	1
Arnoldiola sambuci	.	+	.	.	.	1
Aschistonyx carpinicolus	+	.	.	.	.	1
Bayeriola buhri	.	.	+	.	.	1
Bayeriola thymicola	.	.	+	.	.	1
Bremiola onobrychidis	+	.	.	.	.	1
Contarinia craccae	+	.	.	.	.	1
Contarinia acerplicans	+	.	+	.	.	2
Contarinia aconitifloris	+	+	+	.	.	3
Contarinia aequalis	.	.	+	.	.	1
Contarinia barbichei	.	+	.	.	.	1
Contarinia campanulae	.	.	+	.	+	2
Contarinia carpini	+	.	.	.	.	1
Contarinia coryli	+	.	.	.	.	1
Contarinia dipsacearum	.	.	+	.	.	1
Contarinia fagi	.	+	.	.	.	1
Contarinia heraclei	.	.	+	.	.	1
Contarinia jacobaeae	+	.	.	.	.	1
Contarinia lamiicola	+	.	.	.	.	1
Contarinia lathyri	+	.	.	.	.	1
Contarinia lonicerearum	+	.	.	.	.	1
Contarinia loti	+	+	.	.	.	2
Contarinia marchali	+	.	.	.	.	1
Contarinia martagonis	+	.	.	.	.	1
Contarinia medicaginis	+	.	.	.	.	1
Contarinia molluginis	+	.	.	.	.	1
Contarinia nicolayi	+	.	.	.	.	1
Contarinia petioli	+	+	.	.	.	2
Contarinia scrophulariae	.	+	.	.	.	1
Contarinia tiliarum	+	.	.	.	.	1
Contarinia tragopogonis	+	.	.	.	.	1
Contarinia umbellatarum	.	+	.	.	.	1
Contarinia valerianae	+	.	.	.	.	1
Contarinia viburnorum	+	.	.	.	.	1

Altitude-zone [in m a.s.l.]	Colline: 200-500	Submontane: 501-900	Montane: 901-1500	Subalpine: 1501-1700	Alpine: 1701 - 2400	Total zones
Craneiobia corni	+	.	.	.	.	1
Cystiphora sanguinea	+	+	.	.	.	2
Cystiphora scorzonerae	.	.	+	.	.	1
Cystiphora taraxaci	+	+	+	+	.	4
Dasineura abietiperda	.	.	+	.	.	1
Dasineura acrophila	.	+	+	.	.	2
Dasineura affinis	.	+	.	.	.	1
Dasineura alpestris	.	+	+	.	+	3
Dasineura aparines	+	.	.	.	.	1
Dasineura asperulae	+	.	.	.	.	1
Dasineura auritae	+	+	.	.	.	2
Dasineura campanulae	.	+	+	.	.	2
Dasineura cardaminicola	.	+	.	.	.	1
Dasineura comosae	.	.	+	.	.	1
Dasineura crataegi	+	+	+	+	.	4
Dasineura fraxinea	.	+	.	.	.	1
Dasineura fraxini	+	.	+	.	.	2
Dasineura galiicola	+	+	+	+	+	5
Dasineura geisenheyneri	+	.	.	.	.	1
Dasineura geranii	.	.	+	.	.	1
Dasineura glechomae	+	.	+	.	.	2
Dasineura glyciphylli	.	.	+	.	.	1
Dasineura helianthemi	+	.	.	.	.	1
Dasineura hygrophila	+	.	.	.	.	1
Dasineura hyperici	.	.	+	.	.	1
Dasineura irregularis	.	.	+	.	.	1
Dasineura lamii	.	.	+	.	.	1
Dasineura loewiana	.	+	.	.	.	1
Dasineura lotharingiae	+	.	.	.	.	1
Dasineura mali	.	+	+	.	.	2
Dasineura medicaginis	+	.	.	.	.	1
Dasineura myrtilli	.	+	.	.	.	1
Dasineura periclymeni	+	.	.	.	.	1
Dasineura phyteumatis	+	+	+	+	+	5
Dasineura populeti	.	+	.	.	.	1
Dasineura pteridicola	.	+	.	.	.	1
Dasineura pustulans	+	+	+	.	.	3
Dasineura pyri	.	+	.	.	.	1
Dasineura ranunculi	.	+	.	.	.	1

Altitude-zone [in m a.s.l.]	Colline: 200-500	Submontane: 501-900	Montane: 901-1500	Subalpine: 1501-1700	Alpine: 1701 - 2400	Total zones
Dasineura rosae	+	+	+	.	+	4
Dasineura rubella	+	+	.	.	.	2
Dasineura sanguisorbae	+	+	.	.	.	2
Dasineura senecionis	.	.	+	.	.	1
Dasineura sisymbrii	+	+	.	.	.	2
Dasineura stellariae	+	.	.	.	.	1
Dasineura strumosa	.	+	.	.	.	1
Dasineura subterranea	.	.	+	.	.	1
Dasineura symphyti	+	.	.	.	.	1
Dasineura thomasi	.	+	+	+	+	4
Dasineura tiliae	+	.	.	.	.	1
Dasineura tortilis	+	+	.	.	.	2
Dasineura trifolii	+	+	+	.	.	3
Dasineura tympani	+	+	.	.	.	2
Dasineura ulmaria	+	+	+	.	.	3
Dasineura urticae	+	+	+	.	.	3
Dasineura viciae	+	+	+	.	.	3
Dasineura violae	+	.	.	.	.	1
Dasineura violahirtae	.	+	.	.	.	1
Dasineura virgaureae	.	+	.	.	.	1
Dasineura vitisidaea	.	+	.	+	.	2
Dasineura xylostei	.	+	.	.	.	1
Didymomyia tiliacea	+	+	.	.	.	2
Diodaulus linariae	+	.	.	.	.	1
Diodaulus trailli	+	+	.	.	.	2
Geocrypta campanulae	.	.	+	+	+	3
Geocrypta galii	+	+	+	+	+	5
Harmandiola cavernosa	+	+	.	.	.	2
Harmandiola globuli	+	.	.	.	.	1
Hartigiola annulipes	+	+	+	.	.	3
Iteomyia capreae	+	+	+	+	+	5
Iteomyia major	+	+	.	.	.	2
Jaapiella bryoniae	+	.	.	.	.	1
Jaapiella dittrichi	+	+	.	.	.	2
Jaapiella genisticola	+	.	.	.	.	1
Jaapiella knautiae	.	.	.	+	.	1
Jaapiella scabiosae	.	+	+	.	.	2
Jaapiella thalictri	.	+	.	.	.	1
Jaapiella veronicae	+	+	+	+	+	5

Altitude-zone [in m a.s.l.]	Colline: 200-500	Submontane: 501-900	Montane: 901-1500	Subalpine: 1501-1700	Alpine: 1701 - 2400	Total zones
Janetiella thymi	.	.	+	.	.	1
Kiefferia pericarpiicola	+	.	.	.	.	1
Lasioptera populnea	.	+	+	.	.	2
Loewiola centaureae	+	+	.	.	.	2
Macrodiplosis pustularis	+	+	.	.	.	2
Macrodiplosis roboris	+	+	.	.	.	2
Macrolabis brunellae	.	+	+	.	.	2
Macrolabis heraclei	.	+	+	.	.	2
Macrolabis hieracii	+	.	.	.	.	1
Macrolabis hippocrepidis	.	.	+	.	.	1
Macrolabis holosteae	+	.	.	.	.	1
Macrolabis lamii	.	+	.	.	.	1
Macrolabis luceti	.	+	.	.	.	1
Macrolabis orobi	+	.	.	.	.	1
Macrolabis pilosellae	+	.	.	.	.	1
Macrolabis stellariae	+	.	.	.	.	1
Massalongia rubra	+	+	.	.	.	2
Mayetiola graminis	+	+	+	.	.	3
Mikiola fagi	+	+	+	.	.	3
Neomikiella beckiana	+	.	.	.	.	1
Oligotrophus juniperinus	.	+	.	.	.	1
Oligotrophus panteli	+	+	.	.	.	2
Phegomyia fagicola	+	.	.	.	.	1
Physemocecis ulmi	.	.	+	.	.	1
Placochela nigripes	.	+	.	.	.	1
Planetella cornifex	.	.	+	.	.	1
Planetella gallarum	+	+	+	.	.	3
Putoniella pruni	+	.	.	.	.	1
Rabdophaga clavifex	+	+	.	.	.	2
Rabdophaga degeerii	.	+	.	.	.	1
Rabdophaga deletrix	+	.	.	.	.	1
Rabdophaga dubiosa	+	.	.	.	.	1
Rabdophaga heterobia	+	+	.	.	.	2
Rabdophaga iteobia	+	.	.	.	.	1
Rabdophaga karschi	+	.	.	.	.	1
Rabdophaga marginem-torquens	+	+	+	.	.	3
Rabdophaga nervorum	+	+	+	+	.	4
Rabdophaga pierreana	.	.	.	+	+	2
Rabdophaga pulvini	.	+	.	.	.	1

Altitude-zone [in m a.s.l.]	Colline: 200-500	Submontane: 501-900	Montane: 901-1500	Subalpine: 1501-1700	Alpine: 1701 - 2400	Total zones
Rabdophaga rosaria	+	+	+	.	.	3
Rabdophaga salicis	+	.	+	+	+	4
Rabdophaga terminalis	.	+	.	.	.	1
Rhopalomyia artemisiae	+	+	.	.	.	2
Rhopalomyia hypogaea	.	+	.	.	+	2
Rhopalomyia ptarmicae	+	.	.	.	.	1
Rondaniola bursaria	+	+	.	.	.	2
Sackenomyia reaumurii	+	+	+	.	+	4
Schizomyia galiorum	+	.	+	.	.	2
Spurgia euphorbiae	+	.	.	.	.	1
Wachtliella caricis	+	+	.	.	.	2
Wachtliella ericina	.	+	.	.	.	1
Wachtliella persicariae	+	.	.	.	.	1
Wachtliella stachydis	+	+	+	.	.	3
Zygiobia carpini	+	+	.	.	.	2
Total species	106	87	60	14	14	

- The subalpine zone (1501-1700 m): *Jaapiella knautiae* on *Knautia arvensis* and *Dasineura vitisidaea* on *Vaccinium vitis-idaea*.
- The alpine zone (1701-2400 m): *Contarinia campanulae* in flower bud galls on *Campanula* spp., *Dasineura alpestris* in leaf bud galls on *Arabis alpina* and *Rhopalomyia hypogaea* in stem galls on *Chrysanthemum atratum* and *Ch. leucanthemum*. *Dasineura alpestris* and *Rhopalomyia hypogaea* occur at the highest altitude of 2000 m a.s.l. in the Allgäu Alps in Germany (SCHRÖPPEL 1981).

Contarinia campanulae causes flower bud galls on several species of *Campanula*. It was originally described from *C. rapunculoides*. Later the galls were found on *C. trachelium, C. rotundifolia, C. scheuchzeri* and *C. cochleariifolia*. It occupies a large area in Europe, mainly in its central part. Its galls are also recorded in the UK, the Netherlands, Denmark, Sweden and Norway (Fig. 6B). It occurs from 210 m a.s.l. in the Czech Republic up to 2100 m a.s.l. in the northern Italian Alps (SKUHRAVÁ 1994a, 1994b, SKUHRAVÁ & SKUHRAVÝ 2010b). In Germany the galls of *C. campanulae* were found mainly in central and southern parts. In the Allgäu Alps it occurs at altitudes between 900 and 1900 m a.s.l. (SCHRÖPPEL 1981).

Dasineura alpestris induces leaf bud galls on *Arabis alpina* and *A. hirsuta*. Galls were found by THOMAS (1886) at Sulden in the Alps (northern Italy) at altitudes of about 1900 m a.s.l. KIEFFER (1909) shortly described this species on the galls only. Although the host plant *Arabis alpina* is native to mountainous areas of Europe, North Africa, Central and Eastern Asia and some parts of North America, *D. alpestris* occurs mainly in mountains of Central Europe, in the UK, the Netherlands and northern Europe (Denmark, southern part of Norway and Sweden) (Fig. 6C). The galls are recorded from 197 m a.s.l. in the Czech Republic up to 2230 m a.s.l. in the Alps in northern Italy (SKUHRAVÁ 1994a, 1994b, SKUHRAVÁ & SKUHRAVÝ 2010b). In Germany the galls of *D. alpestris* are recorded at sev-

eral localities throughout the country, more abundantly in southern parts. In the Allgäu Alps, it occurs at altitudes between 800 and 1800 m a.s.l. (SCHRÖPPEL 1980).

Rhopalomyia hypogaea produces stem galls on *Leucanthemum atratum*. Galls were later found also on *Leucanthemum vulgare*. The galls of this species were discovered at the Raxalpe in Austria at altitudes of 1500 m a.s.l. in 1875 and later the species causing these galls was descibed by LÖW (1885). The host plant *L. atratum* is considered to be endemic to Central Europe (TUTIN et al. 1964-1980). Galls of *R. hypogaea* were found scattered in Central Europe, mainly at high altitudes and single localities in Austria, France, Switzerland, northern Spain, northern Italy, the Czech Republic, Slovakia, and also in southern UK, Norway and the European part of Russia (Fig. 6D). *R. hypogaea* is known to occur from 492 m to 1000 m a.s.l. in Slovakia, from 330 to 1800 m a.s.l. in Austria and from 1360 to 1450 m a.s.l. in northern Italy (SKUHRAVÁ 1991, SKUHRAVÁ & SKUHRAVÝ 2009, SKUHRAVÁ & SKUHRAVÝ 2010b). In Germany the galls of *R. hypogaea* occur throughout the country. In the Allgäu Alps it occurs at altitudes between 800 and 1980 m a.s.l. (SCHRÖPPEL 1981).

5.5 Geographic distribution

The the majority (521 species; 75.9 %) of the German gall midge fauna has its centre of distribution in Europe. 80 species are known to occur only in Germany. Several species occur in Germany and in one or two adjacent countries, some others, abundant in Germany, occur additionally in other countries in Central Europe and extend southwards to the Mediterranean and North Africa or to south-east or to western Turkey and the Caucasus (Fig. 7). Typical European gall midges are *Mikiola fagi, Taxomyia taxi, Macrodiplosis pustularis, M. roboris* and *Zygiobia carpini*.

Mikiola fagi producing galls on leaves of *Fagus sylvatica* is a Middle-European species (SKUHRAVÁ 1987). It occurs abundantly in Central Europe throughout nearly the whole distribution of its host plant. *Taxomyia taxi* causing galls on *Taxus baccata* is also a Middle-European species and occurs rarely at indigenous localities of this tree, which has a disjunct distribution in Europe (MEUSEL et al. 1965).

Asphondylia sarothamni, whose larvae induce galls on leaf buds and pods of *Cytisus scoparius*, is a European species with a Subatlantic distribution. It occurs abundantly in Western Europe and also in Germany, and decreases gradually to the east with easternmost records from north-eastern Poland (SKUHRAVÁ 1987).

Hundred and sixteen species (16.9 %), may be regarded as Eurosiberian. They occur abundantly in Europe, extend to Western Siberia, and a few species occur in the most eastern parts of the Palaearctic Region, the Far East. Typical Eurosiberian species are *Lasioptera rubi, Harmandiola cavernosa, H. globuli, H. populi, Iteomyia capreae, Geocrypta galii* and *Dasineura urticae* (SKUHRAVÁ & SKUHRAVÝ 1993a, 1993b). Some species associated with agricultural crops were translocated to other zoogeographical regions and currently have a Holarctic or even cosmopolitan distribution.

Lasioptera rubi, which induces galls on stems of *Rubus idaeus, R. caesius* and other species of the genus *Rubus*, is a widely distributed Eurosiberian species. Although its main host plant *Rubus idaeus* occurs in Eurasia and North America, *L. rubi* occurs only in Eurasia. Stem galls on *Rubus* spp. that occur in North America are caused by another gall midge, *Neolasioptera nodulosa*. *L. rubi* is widespread and abundant in Western Europe. No data are available from Siberia, but records are known from the Far East, Korea and Japan. In Germany, *L. rubi* is one of the most frequently recorded species.

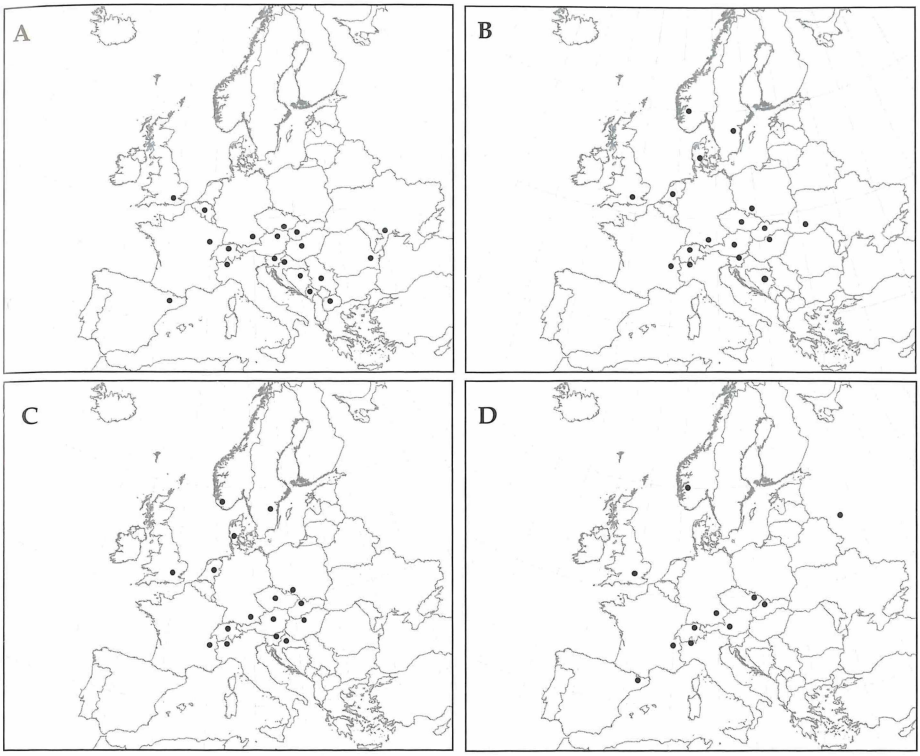

Fig. 6: Distribution of *Sackenomyia reaumurii* (A), *Contarinia campanulae* (B), *Dasineura alpestris* (C), and *Rhopalomyia hypogaea* (D) in Europe (base map: © DeLorme Products, U.S. Pats. 5,030,117 and 4,972,319).

Five species (0.7 %) can be designated as Euroasian. They occur in Europe; some species reach the Mediterranean Sea and western Asia, e.g.Turkey, Armenia and Kazakhstan. Representatives of this group are the phytophagous species *Dasineura abietiperda,* developing in bark or wood galls on *Picea abies, Dasineura bistortae* in leaf galls on *Polygonum bistorta* and *Dasineura papaveris* in seed capsules of *Papaver rhoeas*, and the free-living species *Coquillettomyia mirifica* and *Stomatosema kamali* of unknown biology.

Twenty one species (3.1 %) show a Submediterranean or Mediterranean distribution. They are associated with host plants that originate from the Mediterranean area. Most of them occur in southern Europe and are at their northern border of distribution in Germany, e.g. *Asphondylia coronillae, A. echii, A. ononidis, A. scrophulariae, A. verbasci, Janetia nervicola* and *Lasioptera eryngii.*

Asphondylia coronillae, which galls seed pods of *Coronilla emerus,* is a Mediterranean species. Its host plant is widespread in southern Europe (SKUHRAVÁ & SKUHRAVÝ 1997, 2010b, SKUHRAVÁ et al. 2005, 2006). Records of galls of *A. coronillae* in southern Germany are the northernmost records for this species in Europe.

Asphondylia echii, which induces flower bud galls on *Echium vulgare,* is a Southeuropean species. Its host plant is widely distributed and is considered to be primarily of Mediterranean and western Asian origin (LAUBER & WAGNER 2001). Galls of *A. echii* are found irregularly but locally abundant in southern Europe (SKUHRAVÁ 1991, SKUHRAVÁ &

SKUHRAVÝ 1997, 2010b). Galls of this species, found at several warm places in southern parts of Germany, mark the northern boundary of its distribution in Europe.

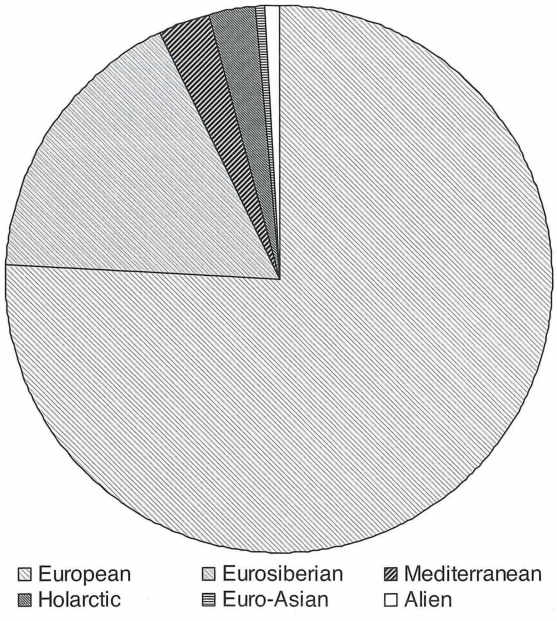

Fig. 7. Zoogeographical elements of gall midge fauna in Germany according to geographic distribution of species in the world.

Janetia nervicola is a Mediterranean species associated with a Southeuropean host plant, *Quercus cerris*. Galls of *J. nervicola* were recorded on trees in botanical gardens in Berlin and Leipzig (BUHR 1966) and Halle (HAASE 1962). These are outlying localities situated far beyond the northern boundary of natural occurrence of *Quercus cerris*, which is in the southern part of Slovakia (SKUHRAVÁ 1980, 1987, SKUHRAVÁ et al. 1984a).

Lasioptera eryngii, which causes stem galls on *Eryngium campestre*, is a Submediterranean and Mediterranean species. Its host plant is widely distributed in southern Europe including the Atlantic coast and the coast of North Africa up to the Caspian Sea. The distribution of *L. eryngii* is smaller. Galls occur abundantly in southern Europe and less frequently in the north (SKUHRAVÁ 1987). In the Czech Republic *L. eryngii* is rare and, therefore, included on the red list of endangered species (SKUHRAVÁ 2005). In southern Germany galls of *L. eryngii* are recorded at Kaiserstuhl in Baden-Württemberg (MÖHN 1968) and Mombacher Sand near Mainz (Rhineland-Palatinate) (SACK 1907). These are the northernmost localities in Europe (SKUHRAVÁ 1980, 1987). RUDOW (1875a) recorded it from northern Germany but did not give a locality.

A group of 18 species (2.6 %) have a Holarctic or even a cosmopolitan distribution. According to their origin, some of them are primarily European or Eurosiberian species. Secondarily they were transferred or introduced with their host plants into the Nearctic Region and other regions. *Contarinia pyrivora* primarily originate from Europe based on the native distribution of its host plant, *Pyrus communis*. However it was described from

North American material collected by RILEY (1886) at Meriden, Connecticut. This species was evidently imported from Europe to America and first discovered there in 1877 on introduced stock (BARNES 1948a, GAGNÉ 1989). At present *C. pyrivora* has a Holarctic distribution and is a major pest of pear (DARVAS et al. 2000).

Four species can be considered to have a truly cosmopolitan distribution: *Contarinis tritici, Didactylomyia longimana, Feltiella acarisuga* and *Mayetiola destructor.*

Five species (0.7 %) are alien to Germany and can be regarded as Neozooa. They do not originate even from other European countries. They were introduced by imported plant seedlings or seeds probably by trade from other parts of the world. *Obolodiplosis robiniae* developing in rolled leaflet margins of *Robinia pseudoacacia, Cupressatia siskiyou* developing among scales in cones of *Chamaecyparis lawsoniana* and *Dasineura gleditchiae* galling leaflets of *Gleditsia triacanthos,* are native to North-America.

Contarinia quinquenotata damaging flower buds of *Hemerocallis fulva* originates from temperate Asia. *Rhopalomyia chrysanthemi,* which develops inside small galls on leaves, stems, buds or flowerheads of commercial chrysanthemums (*Chrysanthemum* spp.), is a widespread species of unknown origin, probably Asia.

From the zoogeographical point of view the gall midge faunas of Germany and Poland are very similar in terms of the percentages of the different zoogeographical elements. The gall midge fauna of Germany differs from that of France mainly in terms of a lower percentage of Mediterranean and Submediterranean species.

5.6 Relationships between gall midges and their host plants

Larvae of phytophagous gall midges live in a close relationship with their host plants. The majority of them induce specific kinds of galls. Some are inquilines within galls, produced by other gall midges or by other insect families. Few species live free on or within plant organs without producing galls (SKUHRAVÁ et al. 1984, MAMAEV, 1975).

Plant galls produced by gall midges can be regarded as microhabitats often characterised by complicated interactions between the gall producing larvae and cohabiting inquilines, predators and mycophagous larvae.

The closeness of associations between the gall inducing species and its host plant can be differentiated into three main groups. Monophagous species feed on one plant species belonging to one plant genus e.g. *Mayetiola puccinelliae* on *Puccinellia maritima* and *Procystiphora gerardi* on *Juncus gerardi.* Oligophagous species live on several plant species of the same plant genus e.g. *Dasineura rosae* on *Rosa* and *Jaapiella schmidti* on *Plantago.* Polyphagous species live on several plant species belonging to different genera of one plant family, for example *Contarinia nasturtii* on Brassicaceae, *Kiefferia pericarpiicola* and *Lasioptera carophila* on Apiaceae, *Mayetiola destructor* on Poaceae and *Resseliella oculiperda* on Rosaceae (MEYER 1984, SKUHRAVÁ & SKUHRAVÝ 2010b). Two German species are highly polyphagous living on various unrelated plant families: *Antichiridium striatum* on Cyperaceae and Poaceae, and *Lasioptera buhri* on Asteraceae, Campanulaceae and Fabaceae.

Overview of host plant species and associated gall midges

Among the 2800 species of plants in Germany (JÄGER & WERNER 2007), 56 families with 221 genera and 513 species are host plants of the 616 species of gall midges. The following abbreviations were used: gall producing larvae (gall), free living larvae (free), inquiline (inq) and zoophagous larvae (zoo). Synonyms of host plants are in square brackets [...].

Abies alba
Aphidoletes thompsoni (zoo), *Paradiplosis abietispectinatae* (gall), *Resseliella crassa* (free), *R. piceae* (gall)
Abies nordmannica
Resseliella piceae (gall)
Acer campestre
Acericecis campestre (gall), *Atrichosema aceris* (gall), *Contarinia acerplicans* (gall), *Dasineura rubella* (gall), *D. tympani* (gall)
Acer platanoides
Drisina glutinosa (gall)
Acer pseudoplatanus
Acericecis vitrina (gall), *Contarinia acerplicans* (gall), *Dasineura irregularis* (gall), *Drisina glutinosa* (gall)
Acer saccharinum [*A. dasycarpum*]
Contarinia acerplicans (gall)
Achillea millefolium
Lasioptera francoisi (gall), *Macrolabis achilleae* (gall), *Ozirhincus millefolii* (gall), *Rhopalomyia millefolii* (gall), *R. ptarmicae* (gall)
Achillea nobilis
Ozirhincus millefolii (gall), *Rhopalomyia millefolii* (gall)
Achillea ptarmica
Macrolabis achilleae (gall), *Ozirhincus millefolii* (gall), *Rhopalomyia palearum* (gall), *R. ptarmicae* (gall)
Aconitum lycotonum [*A. vulparia*], *A. napellus*
Contarinia aconitifloris (gall)
Aegopodium podagraria
Lasioptera carophila (gall), *Macrolabis podagrariae* (gall)
Agrostis capillaris [*A. tenuis, A. vulgaris*]
Hybolasioptera fasciata (gall), *Mayetiola agrostidis* (gall)
Agrostis sp.
Lasioptera calamagrostidis (gall)
Agrostis stolonifera
Mayetiola agrostidis (gall), *M. agrostivora* (gall)
Alnus glutinosa, A. incana
Dasineura tortilis (gall), *Jaapiella clethrophila* (inq), *Macrolabis alnicola* (inq)
Alopecurus geniculatus, A. myosuroides
Stenodiplosis geniculati (gall)
Alopecurus myosuroides
Haplodiplosis marginata (gall)
Alopecurus pratensis
Contarinia merceri (gall), *Dasineura alopecuri* (gall), *Mayetiola alopecuri* (gall), *Stenodiplosis geniculati* (gall)
Alyssum arenarium
Janetiella fallax (gall)
Anethum graveolens
Lasioptera carophila (gall)
Angelica archangelica
Kiefferia pericarpiicola (gall)
Angelica sylvestris

Contarinia baggendorfi (gall), *Dasineura angelicae* (gall), *Kiefferia pericarpiicola* (gall)
Anthemis arvensis, A. cotula
Ozirhincus anthemidis (gall), *O. longicollis* (gall), *Rhopalomyia syngenesiae* (gall)
Anthemis tinctoria
Ozirhincus anthemidis (gall)
Anthriscus sylvestris
Kiefferia pericarpiicola (gall), *Lasioptera carophila* (gall)
Apera spica-venti
Lasioptera calamagrostidis (gall)
Aquilegia vulgaris
Macrolabis aquilegiae (gall)
Arabis alpina, A. caucasica [*A. albida*], *A. hirsuta*
Dasineura alpestris (gall)
Armoracia rusticana
Contarinia nasturtii (gall), *Dasineura armoraciae* (gall)
Arrhenatherum elatius
Haplodiplosis marginata (gall)
Artemisia campestris
Dasineura artemisiae (gall), *Rhopalomyia artemisiae* (gall), *R. baccarum* (gall), *R. campestris* (gall), *R. magnusi* (gall), *R. tubifex* (gall)
Artemisia maritima
Rhopalomyia florum (gall)
Artemisia scoparia
Rhopalomyia artemisiae (gall), *R. baccarum* (gall)
Artemisia vulgaris
Anthodiplosis rudimentalis (gall), *Blastodiplosis artemisiae* (gall), *Contarinia artemisiae* (gall), *Lasioptera artemisiae* (gall), *Rhopalomyia artemisiae* (gall), *R. baccarum* (gall), *R. florum* (gall), *R. foliorum* (gall), *R. magnusi* (gall)
Asparagus officinalis
Contarinia florum (gall)
Asperula cynanchia
Schizomyia galiorum (gall)
Asperula cynanchica, A. tinctoria
Dasineura asperulae (gall)
Aster linosyris [*Linosyris vulgaris*]
Dasineura linosyridis (gall), *D. procera* (gall)
Astralagus arenarius
Dasineura astragalorum (gall)
Astralagus cicer
Dasineura glyciphylli (gall)
Astralagus danicus
Dasineura rossi (gall)
Astralagus glycyphyllos
Dasineura astragalorum (gall), *D. glyciphylli* (gall)
Avena sativa
Haplodiplosis marginata (gall)
Ballota nigra
Contarinia ballotae (gall)
Barbarea intermedia, B. stricta
Dasineura sisymbrii (gall)

Barbarea vulgaris
Contarinia nasturtii (gall), *Dasineura sisymbrii* (gall), *D. stelteri* (gall),
Berberis vulgaris
Dasineura berberidis (gall), *Lasioptera berberina* (gall)
Bertorea incana
Dasineura berteroae (gall)
Betula nana
Massalongia bachmaieri (gall)
Betula papyrifera
Massalongia rubra (gall)
Betula pendula [B. alba, B. verrucosa], B. pubescens
Anisostephus betulinus (gall), *Massalongia rubra* (gall), *Resseliella betulicola* (gall), *Semudobia betulae* (gall), *S. skuhravae* (gall), *S. tarda* (gall)
Brachypodium pinnatum, B. sylvaticum
Mayetiola hellwigi (gall)
Brassica napus
Contarinia nasturtii (gall), *Dasineura napi* (gall), *Gephyraulus raphanistri* (gall)
Brassica oleracea
Contarinia nasturtii (gall), *Dasineura napi* (gall)
Bromus hordeaceus [B. mollis], B. inermis
Stenodiplosis bromicola (gall)
Bryonia alba, B. dioica
Jaapiella bryoniae (gall), *J. parvula* (gall)
Buglossoides purpureocaerulea [Lithospermum]
Dasineura lithospermi (gall)
Bupleurum falcatum
Dasineura bupleuri (gall), *Kiefferia pericarpiicola* (gall), *Lasioptera carophila* (gall), *Parallelodiplosis bupleuri* (gall)
Bupleurum longifolium
Kiefferia pericarpiicola (gall), *Parallelodiplosis bupleuri* (gall)
Buxus sempervirens
Monarthropalpus flavus (gall)
Cakile maritime
Contarinia nasturtii (gall)
Calamagrostis canescens [C. lanceolata]
Hybolasioptera fasciata (gall), *Mayetiola bifida* (gall), *M. bimaculata* (gall), *M. culacera* (gall), *M. lanceolatae* (gall)
Calamagrostis epigejos
Lasioptera calamagrostidis (gall)
Campanula cochleariifolia [C. pusilla]
Contarinia campanulae (gall), *Dasineura campanulae* (gall), *D. thomasi* (gall), *Geocrypta campanulae* (gall)
Campanula rapunculoides
Contarinia campanulae (gall), *Dasineura acuminata* (gall)
Campanula rapunculus
Dasineura rapunculi (gall)
Campanula rotundifolia, C. scheuchzeri
Contarinia campanulae (gall), *Dasineura campanulae* (gall), *Geocrypta campanulae* (gall)
Campanula trachelium

Contarinia campanulae (gall), *Lasioptera buhri* (gall)
Capsella bursa-pastoris
Dasineura napi (gall)
Cardamine amara
Dasineura cardaminicola (gall), *D. cardaminis* (gall)
Cardamine pratensis
Dasineura cardaminis (gall)
Carex acuta [*C. gracilis*]
Planetella gallarum (gall), *P. rosenhaueri* (gall), *P. tuberifica* (gall)
Carex acutiformis
Dasineura koesterbecki (gall), *Planetella caricis* (gall), *P. tumorifica* (gall)
Carex appropinquata [*C. paradoxa*]
Thurauia aquatica (free)
Carex arenaria
Planetella arenariae (gall)
Carex disticha
Wachtliella caricis (gall)
Carex echinata [*C. stellulata*]
Antichiridium caricis (gall), *Planetella caricis* (gall), *P. granifex* (gall), *Thurauia aquatica* (free)
Carex elata [*C. stricta*]
Planetella cornifex (gall), *P. gallarum* (gall), *P. granifex* (gall), *P. tuberifica* (gall)
Carex flacca [*C. glauca*]
Planetella caricis (gall), *P. cornifex* (gall), *P. gallarum* (gall)
Carex muricata
Wachtliella caricis (gall)
Carex nigra [*C. fusca, C. goodenoughii* ssp. *stolonifera, C. goodenowii*]
Planetella gallarum (gall), *P. rosenhaueri* (gall), *Wachtliella caricis* (gall)
Carex otrubae
Dasineura inflata (gall), *Wachtliella caricis* (gall)
Carex pairaei
Wachtliella caricis (gall)
Carex pallescens
Planetella cornifex (gall), *P. granifex* (gall)
Carex paniculata
Dasineura minungula (gall)
Carex pilosa
Planetella fischeri (gall)
Carex pseudocyperus
Antichiridium striatum (gall), *Planetella tumorifica* (gall)
Carex remota
Thurauia aquatica (free)
Carex riparia
Wachtliella caricis (gall)
Carex rostrata [*C. inflata*]
Planetella fischeri (gall), *P. gallarum* (gall)
Carex spp.
Brachydiplosis caricum (gall), *Coquillettomyia dentata* (free), *Herbomyia robusta* (free), *Rhizomyia circumspinosa* (free), *Sterrhaulus corneolus* (gall), *Thurauia uliginosa* (free)
Carex vesicaria

Planetella tarda (gall)
Carex vulpina
Wachtliella caricis (gall)
Carpinus betulus
Aschistonyx carpinicolus (gall), *Contarinia carpini* (gall), *Dasineura ruebsaameni* (gall), *Zygiobia carpini* (gall), *Z. ruebsaameni* (inq)
Carum carvi
Kiefferia pericarpiicola (gall), *Lasioptera carophila* (gall)
Centaurea jacea
Clinodiplosis cilicrus (free), *Loewiola centaureae* (gall)
Centaurea scabiosa
Dasineura miki (gall), *Loewiola centaureae* (gall)
Cerastium arvense, C. glomeratum [*C. viscosum*], *C. semidecandrum*
Dasineura lotharingiae (gall)
Cerastium fontanum [*C. caespitosum, C. holosteoides, C. triviale, C. vulgare*]
Dasineura fructum (gall), *D. lotharingiae* (gall)
Chaerophyllum aromaticum
Kiefferia pericarpiicola (gall), *Macrolabis heraclei* (gall)
Chaerophyllum hirsutum
Macrolabis heraclei (gall)
Chaerophyllum temulum [*C. temulentum*]
Lasioptera carophila (gall)
Chamaecyparis lawsoniana
Cupressatia siskiyou (gall)
Chamaespartium sagittale [*Cytisus sagittalis, Genista sagittalis*]
Dasineura cytisi (gall)
Chondrilla juncea
Cystiphora schmidti (gall)
Chrysanthemum indicum incl. cult. spp.
Ozirhincus longicollis (gall), *Rhopalomyia chrysanthemi* (gall)
Cirsium acaule, C. palustre, C. vulgare [*C. lanceolatum*]
Jaapiella cirsiicola (gall)
Cirsium arvense
Clinodiplosis cilicrus (free), *Jaapiella cirsiicola* (gall), *Macrolabis cirsii* (gall)
Cirsium oleraceum
Clinodiplosis oleracei (free)
Convallaria majalis
Contarinia convallariae (gall), *C. florum* (gall)
Cornus sanguinea
Craneiobia corni (gall)
Coronilla emerus
Asphondylia coronillae (gall)
Coronilla varia
Asphondylia baudysi (gall)
Corylus avellana
Contarinia coryli (gall), *Dasineura corylina* (inq), *Mikomya coryli* (gall)
Crataegus laevigata [*C. oxyacantha*]
Contarinia anthobia (gall), *Dasineura crataegi* (gall), *D. fusca* (inq -?), *D. oxyacanthae* (gall), *Prolauthia circumdata* (inq), *Resseliella crataegi* (gall)

Crataegus monogyna
Contarinia anthobia (gall), *Dasineura crataegi* (gall), *D. oxyacanthae* (gall)
Crepis biennis
Lasioptera buhri (gall)
Cytisus nigricans
Asphondylia cytisi (gall), *Wachtliella niebleri* (gall)
Cytisus scoparius [*Sarothamnus*]
Asphondylia pilosa (gall), *A. sarothamni* (gall), *Contarinia anthonoma* (gall), *C. pulchripes* (gall), *C. scoparii* (gall), *Dasineura tubicoloides* (gall), *Jaapiella sarothamni* (gall), *Janetiella tuberculi* (gall), *Trotteria obtusa* (inq)
Dactylis glomerata
Contarinia dactylidis (gall), *Haplodiplosis marginata* (gall), *Lasioptera calamagrostidis* (gall), *Mayetiola dactylidis* (gall)
Dactylis glomerata ssp. *aschersoniana* [*D. polygama*]
Lasioptera calamagrostidis (gall)
Daucus carota
Amerhapha gracilis (inq), *Kiefferia pericarpiicola* (gall), *Lasioptera carophila* (gall)
Deschampsia flexuosa
Lasioptera calamagrostidis (gall)
Descurainia sophia [*Sisymbrium*]
Contarinia kiefferi (gall), *C. nasturtii* (gall), *Dasineura sisymbrii* (gall)
Diplotaxis muralis
Gephyraulus diplotaxis (gall)
Echium vulgare
Asphondylia echii (gall), *Contarinia echii* (gall)
Elymus repens [*Agropyron, Elytrigia*]
Contarinia tritici (gall), *Haplodiplosis marginata* (gall), *Hybolasioptera fasciata* (gall), *Mayetiola destructor* (gall), *Sitodiplosis mosellana* (gall)
Epilobium angustifolium [*Chamaenerion*]
Dasineura epilobii (gall), *D. kiefferiana* (gall)
Epilobium parviflorum
Dasineura kiefferiana (gall)
Erica herbacea [*E. carnea*], *E. tetralix*
Wachtliella ericina (gall)
Erigeron acer [*E. acris*]
Dasineura erigerontis (gall), *Prodiplosis rhenana* (inq)
Erodium cicutarium [*Geranium*]
Dasineura geranii (gall)
Erucastrum gallicum [*E. pollichii*]
Gephyraulus raphanistri (gall)
Eryngium campestre
Lasioptera eryngii (gall)
Erysimum cheiranthoides
Bayeriola erysimi (gall), *Contarinia nasturtii* (gall)
Erysimum marschallianum [*E. durum*], *E. virgatum*
Bayeriola erysimi (gall)
Euphorbia brittingeri [*E. verrucosa*]
Spurgia euphorbiae (gall)
Euphorbia cyparissias

Dasineura capsulae (gall), *Macrolabis lutea* (inq-?), *Spurgia euphorbiae* (gall)
Euphorbia esula
Dasineura capsulae (gall), *Macrolabis lutea* (inq-?), *Spurgia esulae* (gall)
Euphorbia palustris
Dasineura schulzei (gall)
Euphorbia seguieriana [*E. gerardiana*]
Dasineura loewii (gall)
Fagus sylvatica
Contarinia fagi (gall), *Hartigiola annulipes* (gall), *Lestodiplosis cryphali* (zoo), *L. pulchella* (zoo), *L. trivittata* (zoo), *Macrolabis fagicola* (inq), *Mikiola fagi* (gall), *Phegomyia fagicola* (gall)
Festuca arundinacea
Contarinia festucae (gall), *Dasineura festucae* (gall)
Festuca pratensis
Haplodiplosis marginata (gall), *Lasioptera auricincta* (gall)
Filipendula ulmaria
Dasineura engstfeldi (gall), *D. harrisoni* (gall), *D. pustulans* (gall), *D. ulmaria* (gall)
Filipendula vulgaris [*F. hexapetala, F. pentapetala, Spirea filipendula, Ulmaria filipendula*]
Dasineura filipendulae (gall)
Fraxinus excelsior
Clinodiplosis botularia (inq), *C. invocata* (inq), *Contarinia marchali* (gall), *Dasineura acrophila* (gall), *D. fraxinea* (gall), *D. fraxini* (gall), *Macrolabis pavida* (inq)
Galeopsis tetrahit
Dasineura tetrahit (gall)
Galium anisophyllum
Dasineura galiicola (gall), *Geocrypta galii* (gall)
Galium aparine
Contarinia acrocecis (gall), *Dasineura aparines* (gall), *D. galiicola* (gall), *Macrolabis jaapi* (inq-?)
Galium boreale
Dasineura galiicola (gall), *Geocrypta galii* (gall), *Schizomyia galiorum* (gall)
Galium glaucum [*Asperula galioides, A. glauca*]
Dasineura asperulae (gall), *Schizomyia galiorum* (gall)
Galium megalospermum [*G. helveticum*]
Geocrypta galii (gall)
Galium mollugo
Ametrodiplosis auripes (gall), *Contarinia acrocecis* (gall), *C. molluginis* (gall), *Dasineura galiicola* (gall), *Geocrypta galii* (gall), *Schizomyia galiorum* (gall), *Trotteria galii* (inq)
Galium odoratum [*Asperula*]
Dasineura asperulae (gall)
Galium palustre
Dasineura galiicola (gall), D. *hygrophila* (gall), *Geocrypta galii* (gall)
Galium pumilum [*G. asperum, G. sylvestre*], *G. sylvaticum, G. verum*
Dasineura galiicola (gall), *Geocrypta galii* (gall), *Schizomyia galiorum* (gall), *Trotteria galii* (inq)
Galium saxatile [*G. harcynicum*]
Geocrypta galii (gall), *Schizomyia galiorum* (gall)
Galium uliginosum
Dasineura galiicola (gall), *D. hygrophila* (gall), *Geocrypta galii* (gall), *Schizomyia galiorum* (gall)

Genista germanica
Asphondylia genistae (gall), *Jaapiella genisticola* (gall), *Trotteria obtusa* (inq)
Genista pilosa
Contarinia pulchripes (gall), *Jaapiella genistamtorquens* (gall), *J. genisticola* (gall)
Genista tinctoria
Asphondylia genistae (gall), *Contarinia melanocera* (gall), *Jaapiella genisticola* (gall)
Geranium sanguineum, G. sylvaticum
Dasineura geranii (gall)
Geum rivale, G. urbanum
Contarinia gei (gall)
Glechoma hederacea
Dasineura glechomae (gall), *Rondaniola bursaria* (gall)
Gleditsia triacanthos
Dasineura gleditchiae (gall)
Glyceria maxima [*G. spectabilis*]
Octodiplosis glyceriae (gall)
Gypsophila fastigata, G. repens
Bayeriola buhri (gall)
Hedera helix
Dasineura kiefferi (gall)
Helianthemum nummularium
Dasineura helianthemi (gall)
Hemerocallis fulva, H. lilioasphodelus [*H. flava*]
Contarinia quinquenotata (gall)
Heracleum sphondylium
Contarinia heraclei (gall), *C. nicolayi* (gall), *Kiefferia pericarpiicola* (gall), *Lasioptera carophila* (gall), *L. stelteri* (gall), *Macrolabis heraclei* (gall)
Hieracium aurantiacum, H. bauhini
Cystiphora sanguinea (gall)
Hieracium lactucella [*H. auricula*]
Contarinia pilosellae (gall), *Cystiphora sanguinea* (gall), *Dasineura nervicola* (gall)
Hieracium laevigatum
Cystiphora sanguinea (gall), *Macrolabis hieracii* (gall)
Hieracium murorum [*H. silvaticum*]
Cystiphora sanguinea (gall), *Lasioptera buhri* (gall), *Macrolabis hieracii* (gall), *M. pilosellae* (gall)
Hieracium pilosella
Contarinia pilosellae (gall), *Cystiphora sanguinea* (gall), *Macrolabis pilosellae* (gall)
Hieracium sabaudum [*H. boreale*], *H. tridentatum*
Macrolabis hieracii (gall)
Hieracium umbellatum
Cystiphora sanguinea (gall)
Hieracium vulgatum [*H. lachenalii*]
Contarinia pilosellae (gall), *Cystiphora sanguinea* (gall), *Macrolabis hieracii* (gall)
Hippocrepis comosa
Dasineura comosae (gall), *D. geisenheyneri* (gall), *Macrolabis hippocrepidis* (gall)
Holcus lanatus
Mayetiola holci (gall)
Holcus mollis

Hybolasioptera fasciata (gall), *Mayetiola holci* (gall)
Hordeum vulgare
Haplodiplosis marginata (gall), *Mayetiola destructor* (gall), *M. hordei* (gall)
Hypericum hirsutum, H. montanum, H. tetrapterum
Dasineura hyperici (gall)
Hypericum humifusum
Dasineura hyperici (gall), *D. serotina* (gall)
Hypericum maculatum
Dasineura hyperici (gall), *Geocrypta braueri* (gall)
Hypericum perforatum
Contarinia hyperici (gall), *Dasineura hyperici* (gall), *D. serotina* (gall), *Geocrypta braueri* (gall), *Zeuxidiplosis giardi* (gall)
Hypochoeris glabra
Contarinia hypochoeridis (gall), *Jaapiella compositarum* (gall-?)
Hypochoeris radicata
Contarinia hypochoeridis (gall), *Jaapiella hypochoeridis* (gall-?)
Inula britannica
Acodiplosis inulae (gall), *Contarinia inulicola* (gall)
Inula conyza [*I. squarrosa*]
Acodiplosis inulae (gall), *Neomikiella beckiana* (gall)
Inula hirta
Inulomyia subterranea (gall)
Inula salicina
Contarinia inulicola (gall), *Inulomyia subterranea* (gall)
Isatis tinctoria
Contarinia nasturtii (gall)
Juncus gerardi
Procystiphora gerardi (gall)
Juniperus communis
Oligotrophus gemmarum (gall), *O. juniperinus* (gall), *O. panteli* (gall), *O. schmidti* (gall)
Knautia arvensis, K. dipsacifolia [*K. maxima, K. sylvatica*]
Contarinia dipsacearum (gall), *Jaapiella knautiae* (gall)
Lamium album
Dasineura corniculata (gall), *Macrolabis lamii* (gall)
Lamium galeobdolon [*Galeobdolon luteum*]
Contarinia galeobdolontis (gall), *Dasineura strumosa* (gall)
Lamium galeobdolon ssp. *montanum* [*Lamiastrum montanum*]
Dasineura strumosa (gall)
Lamium maculatum
Contarinia lamii (gall), *C. lamiicola* (gall), *Dasineura lamii* (gall), *D. lamiicola* (gall), *D. strumosa* (gall)
Lamium purpureum
Macrolabis lamii (gall)
Lapsana communis
Lasioptera buhri (gall)
Larix decidua
Dasineura kellneri (gall)
Laserpitium latifolium
Kiefferia pericarpiicola (gall), *Macrolabis laserpitii* (gall)
Lathyrus heterophyllus

Geocrypta heterophylli (gall)
Lathyrus linifolius [*L. montanus*], *L. niger*
Lathyromyza schlechtendali (gall)
Lathyrus pratensis
Anabremia bellevoyei (gall), *Asphondylia lathyri* (gall), *Contarinia jaapi* (gall), *C. lathyri* (gall), *Dasineura lathyri* (gall), *D. lathyricola* (gall), *D. lathyrina* (inq), *D. pratensis* (gall), *Jaapiella volvens* (gall), *Trotteria obtusa* (inq)
Lathyrus sylvestris
Contarinia silvestris (gall), *Dasineura fairmairei* (gall), *Lathyromyza florum* (gall)
Lathyrus tuberosus
Lathyromyza florum (gall)
Lathyrus vernus
Macrolabis orobi (gall)
Leontodon autumnalis, L. hispidus
Cystiphora leontodontis (gall)
Leucanthemum atratum [*Chysanthemum*]
Rhopalomyia hypogaea (gall)
Leucanthemum vulgare [*Chrysanthemum leucanthemum*]
Contarinia chrysanthemi (gall), *Ozirhincus longicollis* (gall), *Rhopalomyia hypogaea* (gall)
Ligustrum vulgare
Placochela ligustri (gall)
Lilium martagon
Contarinia lilii (gall), *Contarinia martagonis* (gall)
Linaria vulgaris
Diodaulus linariae (gall)
Linum bienne [*L. angustifolium*], *L. usitatissimum*
Dasineura sampaina (gall)
Lithospermum officinale
Dasineura lithospermi (gall)
Lonicera nigra, L. tatarica
Contarinia loniceraerum (gall)
Lonicera periclymenum
Dasineura periclymeni (gall), *Macrolabis lonicerae* (gall),
Lonicera xylosteum
Contarinia loniceraerum (gall), *Dasineura excavans* (gall), *D. xylostei* (gall), *Placochela nigripes* (gall)
Lotus corniculatus
Asphondylia melanopus (gall), *Contarinia barbichei* (gall), *C. loti* (gall), *Jaapiella loticola* (gall)
Lotus uliginosus
Contarinia barbichei (gall), *C. loti* (gall), *Jaapiella loticola* (gall)
Lychnis floscuculi [*Silene*]
Dasineura praticola (gall)
Lysimachia vulgaris
Contarinia lysimachiae (gall)
Lythrum salicaria
Bayeriola salicariae (gall)
Majanthemum bifolium
Contarinia majanthemi (gall)
Malus domestica [*M. sylvestris* ssp. *mitis*]

Arthrocnodax mali (zoo), *A. wissmanni* (zoo), *Dasineura mali* (gall), *Endopsylla agilis* (zoo: endoparasit of *Psylla mali* SCHMIDB.), *Macrolabis mali* (inq), *Resseliella oculiperda* (gall)
Malus sylvestris [*M. sylvestris* ssp. *acerba; Pirus acerba*]
Dasineura mali (gall)
Matricaria perforata [*M. inodora, Tripleurospermum inodorum*]
Ozirhincus longicollis (gall), *Rhopalomyia syngenesiae* (gall)
Medicago falcata, M. sativa
Asphondylia miki (gall), *Contarinia medicaginis* (gall), *Dasineura medicaginis* (gall), *Jaapiella medicaginis* (gall)
Medicago lupulina
Asphondylia lupulinae (gall), *Dasineura lupulinae* (gall), *Jaapiella jaapiana* (gall)
Medicago sativa
Dasineura lupulinae (gall)
Medicago x *varia*
Contarinia medicaginis (gall)
Melampyrum arvense
Lasioptera melampyri (gall)
Melica uniflora
Mayetiola buhri (gall)
Melilotus albus, M. officinalis
Lasioptera buhri (gall)
Mentha arvensis, M. suaveolens [*M. rotundifolia*]
Asphondylia menthae (gall)
Molinia caerulea
Antichiridium striatum (gall), *Lasioptera moliniae* (gall), *Mayetiola moliniae* (gall), *M. ventricola* (gall)
Mycelis muralis
Lasioptera buhri (gall)
Myosotis scorpioides [*M. palustris*], *M. stricta* [*M. arenaria*]
Dasineura myosotidis (gall)
Myosoton aquaticum [*Malachium aquaticum, Stellaria aquatica*]
Macrolabis stellariae (gall)
Nasturtium officinale
Contarinia nasturtii (gall)
Nepeta cataria
Jaapiella catariae (gall)
Oenanthe aquatica
Lasioptera carophila (gall)
Onobrychis viciifolia [*O. sativa*]
Bremiola onobrychidis (gall), *Contarinia onobrychidis* (gall)
Ononis repens, O. spinosa
Asphondylia ononidis (gall), *Contarinia ononidis* (gall)
Origanum virens
Blastomyia origani (gall)
Origanum vulgare
Asphondylia hornigi (gall), *Blastomyia origani* (gall)
Papaver argemone
Dasineura papaveris (gall)
Papaver dubium, P. rhoeas

Dasineura papaveris (gall), *Lestodiplosis callida* (zoo)
Pastinaca sativa
Contarinia pastinacae (gall), *Kiefferia pericarpiicola* (gall), *Lasioptera carophila* (gall), *Macrolabis heraclei* (gall)
Petroselinum crispum [*P. sativum*]
Kiefferia pericarpiicola (gall), *Lasioptera carophila* (gall)
Peucedanum alsaticum
Lasioptera carophila (gall)
Peucedanum cervaria
Kiefferia pericarpiicola (gall), *Lasioptera carophila* (gall)
Peucedanum oreoselinum, P. palustre
Jaapiella buhri (gall), *Kiefferia pericarpiicola* (gall), *Lasioptera carophila* (gall), *Macrolabis incognita* (gall)
Phalaris arundinacea
Mayetiola phalaris (gall)
Phleum pratense
Haplodiplosis marginata (gall)
Phragmites australis [*P. communis*]
Giraudiella inclusa (gall), *Lasioptera arundinis* (gall), *L. flexuosa* (gall), *L. hungarica* (gall), *Lestodiplosis tarsonemi* (zoo)
Phyteuma betonicifolium, P. nigrum, P. orbiculare, P. spicatum
Dasineura phyteumatis (gall)
Picea abies [*P. excelsa*]
Aphidoletes abietis (zoo), *Cecidomyia magna* (free), *Coquillettomyia uvae* (free), *Dasineura abietiperda* (gall), *Kaltenbachiola strobi* (gall), *Lestodiplosis coni* (zoo), *L. holstei* (zoo), *Plemeliella abietina* (gall)
Picris hieracioides
Contarinia picridis (gall), *Jaapiella picridis* (gall), *Lasioptera buhri* (gall)
Pimpinella major [*P. magna*]
Diodaulus traili (gall), *Kiefferia pericarpiicola* (gall), *Lasioptera carophila* (gall), *L thuringica* (inq)
Pimpinella saxifrage
Contarinia inquilina (inq), *C. umbellatarum* (gall), *Diodaulus traili* (gall), *Jaapiella hedickei* (gall), *Kiefferia pericarpiicola* (gall), *Lasioptera carophila* (gall), *Trotteria umbelliferarum* (inq)
Pinus mugo [*P. montana*]
Thecodiplosis brachyntera (gall)
Pinus sylvestris
Cecidomyia pini (free), *Contarinia baeri* (gall), *Thecodiplosis brachyntera* (gall)
Pisum sativum
Contarinia pisi (gall)
Plantago lanceolata, P. major, P. maritima
Jaapiella schmidti (gall)
Poa cenisia
Mayetiola graminis (gall)
Poa nemoralis
Mayetiola graminis (gall), *M. joannisi* (gall), *M. radicifica* (gall)
Poa pratensis
Contarinia floricola (gall), *Dasineura poae* (gall), *Haplodiplosis marginata* (gall), *Mayetiola joannisi* (gall), *M. schoberi* (gall), *Sitodiplosis cambriensis* (gall)

Poa trivialis
Contarinia floricola (gall)
Polygonatum multiflorum
Contarinia florum (gall), *Contarinia polygonati* (gall)
Polygonum amphibium, P. lapathifolium, P. persicaria [*Persicaria maculosa*]
Wachtliella persicariae (gall)
Polygonum bistorta [*Bistorta officinalis*]
Dasineura bistortae (gall)
Populus alba
Dasineura populeti (gall), *Harmandiola globuli* (gall), *H. tremulae* (gall)
Populus canescens
Dasineura populeti (gall), *Harmandiola cavernosa* (gall)
Populus tremula
Arthrocnodax incanus (zoo), *Contarinia petioli* (gall), *C. populi* (gall), *C. tremulae* (gall), *Dasineura populeti* (gall), *Harmandiola cavernosa* (gall), *H. globuli* (gall), *H. populi* (gall), *H. pustulans* (gall), *H. tremulae* (gall), *Lasioptera populnea* (inq), *Macrolabis bedeguariformis* (gall), *Rabdophaga giraudiana* (gall)
Potentilla argentea
Dasineura potentillae (gall)
Prunella grandiflora, P. vulgaris
Macrolabis brunellae (gall)
Prunus cerasus [*Cerasus vulgaris*]
Dasineura tortrix (gall), *Lasioptera cerasiphera* (gall)
Prunus domestica
Asphondylia pruniperda (gall), *Dasineura tortrix* (gall), *Putoniella pruni* (gall)
Prunus insititia [*P. domestica* ssp. *insititia*]
Asphondylia pruniperda (gall), *Dasineura sodalis* (inq), *D. tortrix* (gall)
Prunus spinosa
Arthrocnodax peregrinus (zoo), *Asphondylia pruniperda* (gall), *Dasineura sodalis* (inq), *D. tortrix* (gall), *Dichodiplosis langeni* (gall), *Putoniella pruni* (gall)
Pteridium aquilinum
Dasineura pteridicola (gall), *D. pteridis* (gall)
Puccinellia maritima
Mayetiola puccinelliae (gall)
Pulsatilla pratensis, P. vernalis, P. vulgaris [*Anemone pulsatilla*]
Dasineura pulsatillae gall)
Pyrus communis
Apiomyia bergenstammi (gall), *Contarinia pyrivora* (gall), *Dasineura pyri* (gall), *Resseliella oculiperda* (gall)
Pyrus pyraster
Dasineura pyri (gall)
Quercus cerris
Contarinia subulifex (gall), *Dasineura tubularis* (gall), *Dryomyia circinans* (gall), *Janetia cerris* (gall), *J. nervicola* (gall), *Macrodiplosis pustularis* (gall), *M. roboris* (gall)
Quercus lusitanica [*Q. fruticosa*]
Janetia panteli (gall)
Quercus petraea [*Q. sessilis, Q. sessiliflora*], *Q. robur* [*Q. pedunculata*]
Arnoldiola gemmae (inq), *A. libera* (gall), *A. quercus* (inq), *Clinodiplosis cilicrus* (inq), *Contarinia quercina* (gall), *Dasineura dryophila* (inq), *Janetia panteli* (gall), *Lestodiplosis necans*

(zoo), *L. xylodiplosuga* (zoo), *Macrodiplosis pustularis* (gall), *M. roboris* (gall), *Macrolabis quercicola* (inq), *Monodiplosis liebeli* (inq), *Parallelodiplosis galliperda* (inq), *Polystepha malpighii* (gall), *Resseliella quercivora* (gall), *Xenodiplosis laeviusculi* (inq), *Xylodiplosis nigritarsis* (free)

Quercus pubescens
Macrodiplosis roboris (gall)

Ranunculus acris [*R. acer*], *R. bulbosus*
Dasineura ranunculi (gall), *D. traili* (gall)

Ranunculus auricomus
Dasineura auricomi (gall), *D. ranunculi* (gall)

Ranunculus lanuginosus, *R. repens*
Dasineura ranunculi (gall)

Raphanus raphanistrum
Contarinia nasturtii (gall), *Dasineura napi* (gall), *Gephyraulus raphanistri* (gall)

Raphanus sativus
Gephyraulus raphanistri (gall)

Rhamnus cathartica
Contarinia rhamni (gall), *Wachtliella krumbholzi* (gall)

Rhamnus frangula [*Frangula alnus*]
Contarinia rhamni (gall), *Dasineura frangulae* (gall)

Rhinanthus minor
Rhopalomyia cristaegalli (gall)

Ribes nigrum
Dasineura tetensi (gall)

Ribes uva-crispa [*R. grossularia*]
Contarinia ribis (gall), *Dasineura tetensi* (gall)

Robinia pseudoacacia
Obolodiplosis robiniae (gall)

Rorippa amphibia, *Rorippa palustris*, *R. sylvestris* [*Nasturtium*]
Contarinia nasturtii (gall), *Dasineura sisymbrii* (gall)

Rorippa anceps [*R. prostata*]
Contarinia nasturtii (gall)

Rorippa islandica
Dasineura sisymbrii (gall)

Rosa alba
Dasineura rosae (gall)

Rosa canina, *R. tomentosa*
Dasineura rosae (gall), *Macrolabis luceti* (inq)

Rosa corymbifera [*R. dumetorum*], *R. elliptica* [*R. graveolens*], *R. majalis*, *R. micrantha*, *R. pendulina*, *R. rubiginosa*, *R. spinosissima*
Dasineura rosae (gall)

Rosa spp.
Macrolabis luceti (inq)

Rosa spp. cult.
Resseliella oculiperda (gall)

Rubus caesius
Contarinia rubicola (gall), *Dasineura plicatrix* (gall), *Lasioptera rubi* (gall)

Rubus fruticosus
Dasineura plicatrix (gall), *Lasioptera rubi* (gall)

Rubus idaeus
Buhriella rubicola (gall), *Dasineura plicatrix* (gall), *Lasioptera rubi* (gall), *Lestodiplosis plicatricis* (zoo), *Resseliella theobaldi* (gall)
Rubus saxatilis
Lasioptera rubi (gall)
Rubus spp.
Clinodiplosis socialis (inq)
Rumex acetosa
Contarinia rumicis (gall), *Jaapiella rubicundula* (gall)
Rumex acetosella
Contarinia acetosellae (gall), *C. rumicis* (gall), *C. scutati* (gall), *Dasineura rumicicola* (inq), *Jaapiella rubicundula* (gall)
Rumex hydrolapathum
Jaapiella rubicundula (gall)
Rumex scutatus
Contarinia scutati (gall), *C. variabilis* (gall), *Dasineura rumicicola* (inq)
Salix alba
Iteomyia capreae (gall), *Lestodiplosis tibialis* (zoo), *Rabdophaga albipennis* (gall), *R. delethrix* (gall), *R. iteobia* (gall), *R. nervorum* (gall), *R. rosaria* (gall), *R. saliciperda* (gall), *R. salicis* (gall), *R. terminalis* (gall & inq)
Salix appendiculata [*S. grandifolia*]
Iteomyia capreae (gall), *Rabdophaga nervorum* (gall), *R. salicis* (gall)
Salix aurita
Dasineura auritae (gall), *D. minoterminalis* (gall), *Iteomyia capreae* (gall), *I. major* (gall), *Rabdophaga clavifex* (gall), *R. dubiosa* (gall), *R. gemmicola* (gall), *R. iteobia* (gall), *R. karschi* (gall), *R. nervorum* (gall), *R. paliumparens* (gall), *R. pierreana* (gall), *R. pierrei* (gall), *R. pseudococcus* (gall), *R. pulvini* (gall), *R. rosaria* (gall), *R. rosariella* (gall), *R. salicis* (gall), *Rabdophaga viminalis* (gall)
Salix babylonica
Rabdophaga saliciperda (gall)
Salix caprea
Dasineura auritae (gall), *D. minoterminalis* (gall), *Iteomyia capreae* (gall), *I. major* (gall), *Rabdophaga clavifex* (gall), *R. dubiosa* (gall), *R. iteobia* (gall), *R. karschi* (gall), *R. nervorum* (gall), *R. pierreana* (gall), *R. pierrei* (gall), *R. pulvini* (gall), *R. rosaria* (gall), *R. salicis* (gall)
Salix cinerea
Dasineura auritae (gall), *D. minoterminalis* (gall), *Iteomyia capreae* (gall), *I. major* (gall), *Rabdophaga clavifex* (gall), *R. dubiosa* (gall), *R. gemmicola* (gall), *R. karschi* (gall), *R. nervorum* (gall), *R. paliumparens* (gall), *R. pierreana* (gall), *R. pierrei* (gall), *R. pseudococcus* (gall), *R. pulvini* (gall), *R. rosaria* (gall), *R. rosariella* (gall), *R. salicis* (gall), *R. viminalis* (gall)
Salix elaeagnos
Rabdophaga marginemtorquens (gall), *R. nervorum* (gall)
Salix fragilis
Macrolabis saliceti (inq), *Rabdophaga delethrix* (gall), *R. rosaria* (gall), *R. saliciperda* (gall), *R. terminalis* (gall & inq)
Salix pentandra
Rabdophaga lattkei (gall), *R. nervorum* (gall)
Salix purpurea
Rabdophaga degeerii (gall), *R. insignis* (gall), *R. justini* (gall), *R. lindhardti* (gall), *R. nervorum* (gall), *R. pierreana* (gall), *R. rosaria* (gall), *R. salicis* (gall), *R. strobilina* (inq)

Salix repens
Rabdophaga exsiccans (gall), R. gemmicola (gall), R. jaapi (gall), R. pulvini (gall), R. repenticola (gall), R. rosaria (gall), R. viminalis (gall)
Salix repens ssp. dunensis
Rabdophaga karschi gall), R. repenticola (gall), R. repentiperda (gall)
Salix rosmarinifolia [S. repens ssp. rosmarinifolia]
Rabdophaga exsiccans (gall), R. repenticola (gall), R salicis (gall), R. schicki (gall), R. schreiteri (inq)
Salix spp.
Rabdophaga nielsenii (gall), R. schwangarti (gall)
Salix triandra [S. amygdalina]
Rabdophaga heterobia (gall), R. nervorum (gall), R. terminalis (gall & inq), R. triandraperda (gall)
Salix viminalis
Rabdophaga marginemtorquens (gall), R. roskami (gall), R. vigemmae (gall), R. viminalis (gall)
Salix waldsteiniana
Rabdophaga nervorum (gall), R. salicis (gall)
Salvia pratensis
Dasineura salviae (gall)
Sambucus ebulus, S. nigra
Arnoldiola sambuci (inq), Contarinia sambuci (gall), Placochela nigripes (gall)
Sambucus racemosus
Placochela nigripes (gall)
Sanguisorba minor
Dasineura sanguisorbae (gall)
Sanguisorba officinalis
Contarinia steini (gall), Dasineura peinei (inq), D. sanguisorbae (gall)
Saxifraga granulata
Dasineura saxifragae (gall)
Scabiosa columbaria
Contarinia scabiosae (gall), Jaapiella scabiosae (gall)
Scorzonera humilis
Cystiphora scorzonerae (gall)
Scrophularia canina
Asphondylia scrophulariae (gall)
Scrophularia nodosa
Contarinia scrophulariae (gall)
Secale cereale
Contarinia tritici (gall), Haplodiplosis marginata (gall), Hybolasioptera fasciata (gall), Mayetiola destructor (gall), Sitodiplosis mosellana (gall)
Selinum carvifolia
Lasioptera carophila (gall)
Senecio erucifolius, S. viscosus
Contarinia jacobaeae (gall)
Senecio jacobaea
Contarinia aequalis (gall), C. jacobaeae (gall)
Senecio nemorensis ssp. fuchsii
Contarinia aequalis (gall), Dasineura senecionis (gall)
Senecio sylvaticus

Contarinia aequalis (gall)
Senecio vulgaris
Contarinia jacobaeae (gall), *Jaapiella crinita* (inq)
Seseli libanotis [*Libanotis montana*]
Jaapiella dittrichi (gall), *Kiefferia pericarpiicola* (gall), *Trotteria umbelliferarum* (inq)
Silaum silaus [*Silaus flavescens, S. pratensis*]
Jaapiella dittrichi (gall), *Kiefferia pericarpiicola* (gall), *Lasioptera carophila* (gall)
Silene acaulis
Jaapiella alpina (gall)
Silene dioica [*Melandrium dioicum, M. diurnum, M. rubrum, M. sylvestre*]; *Silene latifolia* ssp. *alba* [*Melandrium album; Silene alba, S. pratensis*]
Contarinia steini (gall), *Neomikiella lychnidis* (gall)
Silene noctiflora [*Melandrium noctiflorum*]
Neomikiella lychnidis (gall)
Silene vulgaris [*S. cucubalus, S. inflata*]
Dasineura subterranea (gall), *Jaapiella floriperda* (gall), *J. inflatae* (gall)
Sinapis arvensis [*Brassica sinapistrum*]
Dasineura napi (gall), *Gephyraulus raphanistri* (gall)
Sisymbrium loeselii
Dasineura rostratae (gall)
Sisymbrium officinale
Contarinia nasturtii (gall), *Dasineura kleini* (inq), *D. sisymbrii* (gall)
Solanum dulcamara
Contarinia solani (gall), *Macrolabis dulcamarae* (inq)
Solidago virgaurea
Dasineura virgaeaureae (gall)
Sonchus arvensis, S. oleraceus
Contarinia schlechtendaliana (gall), *Cystiphora sonchi* (gall)
Sonchus asper, S. palustris
Cystiphora sonchi (gall)
Sonchus sp.
Lasioptera ruebsaameni (gall)
Sorbus aucuparia
Contarinia floriperda (gall), *C. sorbi* (gall)
Sorbus torminalis
Contarinia sorbi (gall)
Stachys recta
Wachtliella stachydis (gall)
Stachys sylvatica
Ametrodiplosis crassinerva (gall), *Wachtliella stachydis* (gall)
Stellaria graminea
Ametrodiplosis duclosii (gall)
Stellaria holostea
Dasineura holostea (gall), *D. silvicola* (gall), *D. stellariae* (gall), *Macrolabis holosteae* (gall)
Stellaria media
Macrolabis stellariae (gall)
Stellaria nemorum
Macrolabis buhri (gall)
Succisa pratensis

Contarinia dipsacearum (gall)
Symphytum officinale
Dasineura foliumcrispans (gall), *D. symphyti* (gall)
Symphytum uplandicum [*S. asperum*]
Dasineura symphyti (gall)
Tanacetum vulgare [*Chrysanthemum*]
Arthrocnodax jaapi (zoo), *Contarinia tanaceti* (gall), *Monobremia subterranea* (zoo), *Ozirhincus tanaceti* (gall), *Rhopalomyia tanaceticola* (gall)
Taraxacum officinale
Cystiphora taraxaci (gall)
Taxus baccata
Taxomyia taxi (gall)
Teucrium chamaedrys
Dasineura teucrii (gall)
Thalictrum flavum, T. lucidum [*T. angustifolium*]
Ametrodiplosis thalictricola (gall), *Jaapiella thalictri* (gall)
Thalictrum minus, T. simplex
Ametrodiplosis thalictricola (gall)
Thlaspi arvense
Contarinia thlaspeos (gall)
Thymus pulegioides [*T. chamaedrys*]
Bayeriola thymicola (gall), *Janetiella thymi* (gall)
Thymus serpyllum
Asphondylia serpylli (gall), *Bayeriola thymicola* (gall), *Janetiella thymi* (gall)
Tilia cordata [*T. parvifolia, T. ulmifolia*]
Contarinia ramicola (gall), *C. tiliarum* (gall), *Dasineura thomasiana* (gall), *D. tiliae* (gall), *Didymomyia tiliacea* (gall), *Macrolabis floricola* (inq), *Physemocecis hartigi* (gall)
Tilia platyphyllos [*T. grandifolia*]
Contarinia ramicola (gall), *C. tiliarum* (gall), *Dasineura thomasiana* (gall), *D. tiliae* (gall), *Didymomyia tiliacea* (gall), *Lasioptera tiliarum* (inq), *Macrolabis floricola* (inq), *Physemocecis hartigi* (gall)
Tilia tomentosa [*T. alba, T. argentea*]
Contarinia tiliarum (gall), *Dasineura thomasiana* (gall), *D. tiliae* (gall)
Tolpis staticifolia [*Chlorocrepis, Hieracium*]
Contarinia pilosellae (gall)
Torylis japonica [*Torilis anthriscus*]
Kiefferia pericarpiicola (gall), *Lasioptera carophila* (gall)
Tragopogon pratensis
Contarinia tragopogonis (gall), *Lasioptera buhri* (gall)
Trifolium alpestre, T. aureum, T. campestre [*T. procumbens*], *T. fragiferum, T. montanum*
Dasineura trifolii (gall)
Trifolium hybridum
Dasineura gentneri (gall), *D. leguminicola* (gall), *D. trifolii* (gall)
Trifolium medium
Dasineura axillaris (gall), *D. leguminicola* (gall), *D. trifolii* (gall), *Hadrobremia longiventris* (gall)
Trifolium pratense
Dasineura gentneri (gall), *D. leguminicola* (gall), *D. trifolii* (gall), *Tricholaba trifolii* (gall & inq)

Trifolium repens
Dasineura gentneri (gall), *D. trifolii* (gall), *Tricholaba trifolii* (gall & inq)
Triticum aestivum [*T. sativum, T. vulgare*]
Contarinia tritici (gall), *Haplodiplosis marginata* (gall), *Hybolasioptera fasciata* (gall), *Mayetiola destructor* (gall), *Sitodiplosis mosellana* (gall)
Ulmus glabra [*U. montana, U. scabra*]; *U. minor* [*U. campestris, U. carpinifolia, U. diversifolia, U. stricta*]
Coniophora autumnalis (gall), *Dasineura ulmicola* (gall), *Janetiella lemeei* (gall), *Physemocecis ulmi* (gall)
Ulmus laevis [*U. effusa, U. pedunculata*]
Coniophora autumnalis (gall), *Physemocecis ulmi* (gall)
Urtica dioica
Dasineura dioicae (gall), *D. urticae* (gall)
Urtica urens
Dasineura urticae (gall)
Vaccinium myrtillus
Dasineura myrtilli (inq- ?), *Jaapiella vacciniorum* (gall)
Vaccinium uliginosum
Hygrodiplosis vaccinii (gall)
Vaccinium vitis-idaea
Dasineura vitisidaea (gall)
Valeriana officinalis
Contarinia crispans (gall), *C. valerianae* (gall)
Valeriana officinalis ssp. *sambucifolia* [*V. excelsa, V. sambucifolia*]
Contarinia valerianae (gall)
Verbascum densiflorum [*V. thapsiforme*], *V. lychnitis*
Asphondylia verbasci (gall)
Verbascum nigrum
Asphondylia verbasci (gall), *Contarinia anthophthora* (gall)
Verbascum orientale
Contarinia anthophthora (gall)
Veronica beccabunga, V. montana, V. polita, V. serpyllifolia, V. teucrium
Jaapiella veronicae (gall)
Veronica chamaedrys
Jaapiella veronicae (gall), *Macrolabis incolens* (inq)
Veronica officinalis
Dasineura similis (gall), *Jaapiella veronicae* (gall)
Veronica scutellata
Dasineura similis (gall)
Veronica spicata
Dasineura spicatae (gall)
Viburnum lantana, V. opulus
Contarinia lonicerearum (gall), *C. viburnorum* (gall), *Sackenomyia reaumurii* (gall)
Vicia angustifolia
Dasineura viciae (gall), *Macrolabis vicicolus* (inq)
Vicia cracca
Contarinia craccae (gall), *Dasineura loewiana* (gall), *D. spadicea* (gall), *D. viciae* (gall), *Macrolabis vicicolus* (inq), *Tricholaba viciarum* (gall)
Vicia hirsuta [*Ervum hirsutum*]

Asphondylia ervi (gall)
Vicia sativa
Dasineura spadicea (gall), *D. viciae* (gall)
Vicia sepium
Dasineura viciae (gall), *Tricholaba similis* (inq)
Vicia sylvatica
Asphondylia ervi (gall), *Tricholaba viciobia* (gall)
Vicia tenuifolia
Dasineura loewiana (gall), *D. viciae* (gall)
Vicia tetrasperma
Dasineura loewiana (gall)
Vicia villosa
Anabremia massalongoi (gall)
Vincetoxicum hirundinaria [*V. officinale, Asclepias & Cynanchum vincetoxicum*]
Contarinia asclepiadis (gall), *C. vincetoxici* (gall)
Viola arvensis [*V. tricolor* ssp. *arvensis*], *V. tricolor*
Dasineura violae (gall)
Viola canina, V. palustris, V. reichenbachiana [*V. sylvatica, V. sylvestris* p.p.]
Dasineura affinis (gall)
Viola hirta
Dasineura violahirtae (gall)
Viola odorata
Dasineura odoratae (gall)
Vitis vinifera
Arthrocnodax vitis (zoo), *Contarinia viticola* (gall), *Lestodiplosis parricida* (zoo), *Vitisiella oenephila* (gall)

Host plant families and associated gall midges

On average, more than one species of gall midges is associated with one species of plant - the average relation is 1.2 : 1 (Table 5). Compared with other European countries, this relation is similar to that found in Bulgaria (1.3 : 1). Higher values are recorded for Austria, Greece and Poland (1.5 : 1 each) and France (1.8 :1) (SKUHRAVÁ & SKUHRAVÝ 1997, 2009; SKUHRAVÁ et al. 1992, 2005, 2008).

At the genus level, in Germany 221 plant genera host 616 species of gall midges which means that averagely one plant genus is associated with about three species of gall midges (1 : 2.8). Usually there are several genera in each plant family that are suitable hosts of gall midges and, therefore, species rich plant families include many plant genera that may be host plants of gall midges. Species poor plant families may also include host plants of gall midges, e.g. Taxaceae with only one genus, *Taxus*, hosts only one species of gall midge, *Taxomyia taxi*, in Germany.

The Fabaceae (Leguminosae), one of the species richest and economically most important plant families in the world, includes 715 genera. In Germany 17 genera of Fabaceae host 74 species of gall midges, e.g.: *Lathyrus* hosts 16 species, *Vicia* 10, *Medicago* 7, *Genista* 6 and *Trifolium* 6.

The Asteraceae (Compositae) is a species rich and widespread plant family with about 1620 genera. In Germany 27 plant genera host 67 gall midge species, e.g. *Artemisia* hosts 12 species, *Achillea* 6 and *Hieracium* 6.

Table 5: Plant families and relations between gall-inducing and plant-inhabiting gall midges to host plants. Abbreviations: gall: phytophagous inducing plant galls; inq: inquilines developing in galls induced by another species; free: free living species; my: mycophagous species; zoo: zoophagous species; *Fabaceae: *Tricholaba trifolii* both galls & inq, *Salicaceae *Rabdophaga terminalis* both galls & inq; Total*: *Clinodiplosis cilicrus* free on Asteraceae & inq on Fagaceae; *Antichiridium striatum* galls on Cyperaceae & Poacea; *Lasioptera buhri* galls on Asteraceae & Campanulaceae & Fabaceae; G : Hp ratio: gall midges per host plant species.

Plant family	Number of plants			Hosts	Gall midges				Total	G : Hp
	Gen.	Spec.	Host spec.	(%)	Gall	Inq	Free or my	Zoo		
Fabaceae*	17	113	52	46.0	70	5	.	.	74*	1.4
Asteraceae	27	755	63	8.3	61	2	2	2	67	1.1
Salicaceae*	2	37	19	51.4	51	5	.	2	57*	3.0
Poaceae	24	176	36	20.5	44	.	.	1	45	1.3
Rosaceae	11	516	34	6.6	29	7	1	5	42	1.2
Fagaceae	2	6	6	100.0	16	9	1	5	31	5.2
Apiaceae	20	63	28	44.4	20	4	.	.	24	0.9
Lamiaceae	12	61	21	34.4	24	.	.	.	24	1.1
Cyperaceae	1	106	21	19.8	18	.	5	.	23	1.1
Brassicaceae	20	79	34	43.0	16	1	.	.	17	0.5
Caryophyllaceae	6	58	18	31.0	17	.	.	.	17	0.9
Pinaceae	4	9	6	66.7	8	.	4	4	16	2.7
Rubiaceae	2	33	15	45.5	9	2	.	.	11	0.7
Scrophulariaceae	6	72	18	25.0	10	1	.	.	11	0.6
Betulaceae	2	7	6	85.7	8	2	.	.	10	1.7
Caprifoliaceae	3	11	9	81.8	9	1	.	.	10	1.1
Aceraceae	1	6	4	66.7	8	.	.	.	8	2.0
Campanulaceae	2	28	10	35.7	8	.	.	.	8	0.8
Corylaceae	2	2	2	100.0	6	2	.	.	8	4.0
Oleaceae	2	4	2	50.0	5	3	.	.	8	4.0
Polygonaceae	2	25	8	32.0	7	1	.	.	8	1.0
Ranunculaceae	5	109	15	13.8	8	.	.	.	8	0.5
Tiliaceae	1	3	3	100.0	6	2	.	.	8	2.7
Liliaceae	6	9	7	77.8	7	.	.	.	7	1.0
Boraginaceae	5	25	7	28.0	6	.	.	.	6	0.9
Euphorbiaceae	1	27	5	18.5	5	1	.	.	6	1.2
Cupressaceae	2	4	2	50.0	5	.	.	.	5	2.5
Ericaceae	2	10	5	50.0	4	1	.	.	5	1.0
Hypericaceae	1	12	6	50.0	5	.	.	.	5	0.8
Dipsacaceae	3	10	4	40.0	4	.	.	.	4	1.0
Ulmaceae	1	3	3	100.0	4	.	.	.	4	1.3
Violaceae	1	30	7	23.3	4	.	.	.	4	0.6
Vitaceae	1	2	1	50.0	2	.	.	2	4	4.0

Plant family	Gen.	Spec.	Host spec.	Host spec.	Gall	Inq	Free or my	Zoo	Total	H:P
Rhamnaceae	1	3	2	66.7	3	.	.	.	3	1.5
Asclepiadaceae	1	1	1	100.0	2	.	.	.	2	2.0
Berberidaceae	1	1	1	100.0	2	.	.	.	2	2.0
Cucurbitaceae	1	2	2	100.0	2	.	.	.	2	1.0
Dennstaedtiaceae	1	1	1	100.0	2	.	.	.	2	2.0
Grossulariaceae	1	6	2	33.3	2	.	.	.	2	1.0
Onagraceae	1	21	2	9.5	2	.	.	.	2	1.0
Papaveraceae	1	10	3	30.0	1	.	.	1	2	0.7
Solanaceae	1	9	1	11.1	1	1	.	.	2	2.0
Urticaceae	1	4	2	50.0	2	.	.	.	2	1.0
Valerianaceae	1	9	2	22.2	2	.	.	.	2	1.0
Araliaceae	1	1	1	100.0	1	.	.	.	1	1.0
Buxaceae	1	1	1	100.0	1	.	.	.	1	1.0
Cistaceae	1	4	1	25.0	1	.	.	.	1	1.0
Cornaceae	1	5	1	20.0	1	.	.	.	1	1.0
Geraniaceae	2	23	3	13.0	1	.	.	.	1	0.3
Juncaceae	1	31	1	3.2	1	.	.	.	1	1.0
Linaceae	1	8	2	25.0	1	.	.	.	1	0.5
Lythraceae	1	2	1	50.0	1	.	.	.	1	1.0
Plantaginaceae	1	10	3	30.0	1	.	.	.	1	0.3
Primulaceae	1	5	1	20.0	1	.	.	.	1	1.0
Saxifragaceae	1	19	1	5.3	1	.	.	.	1	1.0
Taxaceae	1	1	1	100.0	1	.	.	.	1	1.0
Total*: 56 families	221	2588	513	19.8	534*	50	13	22	616*	1.2

The Salicaceae is a species poor family, which includes two species rich genera, *Salix* and *Populus*, and about 50 smaller genera (according to recent genetic studies). In Germany 57 species of gall midges are associated with Salicaceae: 44 with *Salix* and 13 with *Populus*.

The Poaceae (Gramineae) is a species rich and economically important plant family with about 650 genera, including grasses and cereals. In Germany 24 genera of this family host 45 gall midge species, e.g. *Poa* 7 species, *Calamagrostis* 6, *Phragmites, Secale and Triticum* 5 species each, *Dactylis, Hordeum* and *Festuca* 3 species each.

The Rosaceae is a medium species rich plant family with 95 genera. It includes several economically important species with edible fruits, ornamental trees and shrubs. In Germany 11 genera host 42 gall midge species, e.g. *Rubus* 7 species, *Malus* and *Crataegus* 6 species each, *Filipendula* 5, *Pyrus* 4 and *Rosa* 3.

The Fagaceae family contribute with 10 genera and about 900 species of evergreen and deciduous trees and shrubs. Only two genera hosting 31 species of gall midges: *Quercus* 23 species and *Fagus* 8 occur in Germany.

The Apiaceae is a species rich plant family with about 430 genera. In Germany 20 genera host 24 gall midge species, e.g. *Pimpinella* 8 species and *Heracleum* 6.

The Lamiaceae (Labiatae) is a medium species rich plant family with 236 genera. In Germany 12 genera host 24 species of gall midges, e.g. *Lamium* 8 species, *Thymus* 3 , *Glechoma* and *Stachys* 2 species each.

The Cyperaceae is a species rich family with 109 genera distributed mainly in tropical Asia and South America. In Germany only one genus, *Carex*, exists which hosts 23 species of gall midges.

The Brassicaceae (Cruciferae) is an economically important family with about 336 genera. In Germany 20 genera are hosts of 17 gall midge species, e.g. *Brassica* is the host plant of 3 species.

The Caryophyllaceae is a species rich cosmopolitan family of mostly herbaceous plants with 86 genera. In Germany 6 plant genera are associated with 17 species of gall midges, e.g. *Silene* with 6 species and *Stellaria* with 7.

At the species level the associations between particular host plants and gall midges varies considerably in the different plant families. The highest ratio is recorded for the Fagaceae (1 : 5.2), in which 6 species of host plants belonging to two genera (*Fagus* and *Quercus*) host 31 gall midge species. Relatively high ratios of 1 : 4 are characteristic for the Corylaceae (*Corylus avellana* and *Carpinus betulus* with 8 species), Oleaceae (*Fraxinus excelsior* with 7 species and *Ligustrum vulgare* with only one species) and Vitaceae (*Vitis vinifera* with 4 species), respectively. Nine plant families have ratios between 1 : 2 and 1 : 3, and the remaining 43 plant families between 1 : 0.3 and 1 : 1.7.

Herbaceous plants are the most dominant group with 400 species (78 %) associated with 387 (62.8 %) gall midge species, whereas only 113 species (22 %) of trees and shrubs host 229 (37.2 %) species of gall midges.

Among broad-leaved trees and shrubs, *Quercus robur, Q. petraea, Populus tremula, Salix aurita* and *Salix cinerea* host the highest numbers of species of gall midges.

Two oaks, i.e. *Quercus robur* and *Q. petraea*, each host 18 species of gall midges. Seven of them produce galls, eight are inquilines in galls caused by other gall midges, two are predators of other gall midge larvae and one is a free living species.

All 19 species of gall midges on *Salix aurita* and 18 on *Salix cinerea* produce galls. Among the 13 species of gall midges on *Populus tremula* eleven induce galls, one is an inquiline and one is zoophagous attacking larvae of *Dasineura populeti*.

Lower number of species of gall midges is associated with coniferous trees: 8 species occur on *Picea abies*, 3 on *Pinus sylvestris*, 4 on *Abies alba* and 4 on *Juniperus communis*. Only one gall midge species is associated with *Larix decidua* and *Taxus baccata*.

Among the herbaceous plants, *Lathyrus pratensis* hosts the highest number of gall midges (10 species), followed by *Artemisia vulgaris* with 9, *Galium mollugo* and *Pimpinella saxifraga* with 7 species each. Most of the herbaceous plants host only one or two gall midge species.

In terms of the plant families, 12.0 % of all the German gall midge species are associated with species of Fabaceae, 10.9 % with Asteraceae, 9.3 % with Salicaceae, 7.3 % with Poaceae, 6.8 % with Rosaceae and 5.0 % with Fagaceae. Usually several plant genera of a plant family are suitable hosts for gall midges. As indicated in Tables 5, species richness of gall midges does not correlate with the species richness of the plant families.

5.7 Economic importance

In Germany over the last 150 years, approximately 40 species of gall midges are recorded as pests of cultivated plants, forest trees and shrubs. A review of the most important pests of agricultural plants is given in FRÖHLICH (1960).

The most important species of gall midges recorded as pests of agricultural plants and forest trees and shrubs in Germany are given in Table 6 and Table 7.

Agricultural pests

Cereals

Four gall midges are pests of cereals - wheat, barley and rye - in Germany. Among these species, *Contarinia tritici* and *Sitodiplosis mosellana* infest the ears whereas *Haplodiplosis marginata* and *Mayetiola destructor* injure the stems. Larvae of *Contarinia tritici* and *Sitodiplosis mosellana* develop within the ears of wheat and destroy the inner parts of developing flowers and grains. Both *Contarinia tritici* and *Sitodiplosis mosellana* attack the ears at the flowering stage and the developing grain, respectively. In the past, large losses of yield were recorded in 1936 (KLEE 1936), between 1955 and 1957 (SPEYER 1957, SPEYER & WAEDE 1956, WAEDE 1957, 1959, 1961) and between 1972 and 1986 (BASEDOW 1972, 1986, BASEDOW & SCHÜTTE 1973, LÜBKE & WETZEL 1984, WETZEL et al. 1984). Intensive studies on these pests, their physiology, economy and pest control, especially in Saxony-Anhalt, were carried out by BARTELS (1992), VOLKMAR et al. (2008), GAAFAR & VOLKMAR (2009, 2010), GAAFAR et al. (2010, 2011a, 2011b), EL-WAKEIL et al. (2010), HAAS et al. (2010) and LEHMHUS & HEIMBACH (2012).

Larvae of the saddle gall midge (*Haplodiplosis marginata*) cause saddle galls on stems. Stem galls of this species were first discovered at Württemberg and their causer was described by VON ROSER (1840). Later the galls were recorded at Fulda in Hesse and described by WAGNER (1871). Since 1958 there have been outbreaks of *H. marginata,* lasting from two to several years, in many European countries. Outbreaks were first recorded in Serbia, then in Austria (FABER 1959) and Germany (SCHICK 1958, HEDDERGOTT 1960, 1963a, 1963b, BAIER 1964, SCHÜTTE 1964, JANKE 1966, WEIGAND 1972, WEIDNER 1985). The course and reasons for such outbreaks in the Czech Republic and Slovakia were described by SKUHRAVÝ et al. (1993).

The Hessian midge (*Mayetiola destructor*), whose larvae develop at the base of the first internode near the soil, was a serious pest of cereals in the first half of the 20th century, mainly in Russia and adjacent countries. It occurs also in Poland and caused serious damage there (SKUHRAVÁ et al. 1977). In North Germany galls of *M. destructor* were recorded in considerable numbers on winter rye (*Secale cereale*) and Triticale (hybrid of female wheat and male rye: *Triticum aestivum* x *Secale cereale*) around Schwerin (BIELKA et al. 1986, STELTER et al. 1991). Its occurrence and pest status decreased throughout the whole of Europe in the second half of the 20th century. This pest was transferred from Ukraine to the USA, where it is one of the main pests of cereals (SKUHRAVÁ et al. 1984b, DARVAS et al. 2000).

Grasses

Only few species of gall midges (5) are pests of grasses in Germany: *Contarinia dactylidis* on *Dactylis glomerata*, *Contarinia merceri* on *Alopecurus pratensis*, *Contarinia floricola* (*C. poae*) on *Poa pratensis* and *Sitodiplosis cambriensis* on *Poa trivialis*. Larvae of all these species develop in the inflorescences. Larvae of *Mayetiola phalaris* develop in stems of *Phalaris arundinacea*.

TOMASZEWSKI (1931) described the damage done by gall midge larvae to the inflorescences of *Poa pratensis* at Randowbruch (Western Pomerania) without giving the name of the species. This pest was later referred to *Contarinia floricola*. It also caused damage in Bavaria. Its biology and method of controlling were studied by FRÖHLICH (1958a), MÜHLE (1944, 1953, 1957), MÜHLE et al. (1971) and WETZEL in MÜHLE et al. (1971).

Vegetable and fodder crops

Eight species of gall midges are pests of vegetable and fodder crops in Germany. The most important is *Dasineura napi*, a pest of rape.

Table 6: Species of gall midges injurious to agricultural plants in Germany

Host plant	Species of gall midge	Injured plant organ
Cereals		
Triticum aestivum	*Contarinia tritici*	inflorescence
	Sitodiplosis mosellana	inflorescence
Hordeum,Triticum	*Haplodiplosis marginata*	stem
Hordeum, Secale, Triticum, x *Triticale*	*Mayetiola destructor*	stem
Grasses		
Dactylis glomerata	*Contarinia dactylidis*	inflorescence
Poa pratensis	*Contarinia floricola* (*C. poae*)	inflorescence
Alopecurus pratensis	*Contarinia merceri*	inflorescence
Phalaris arundinacea	*Mayetiola phalaris*	stem
Poa trivialis	*Sitodiplosis cambriensis*	inflorescence
Vegetable and fodder crops		
Brassica napus	*Contrinia nasturtii*	flower and leaf bud
	Dasineura napi (*D. brassicae*)	siliqua
Daucus carota	*Kiefferia pericarpiicola*	fruit
Medicago sativa	*Asphondylia miki*	fruit
	Contarinia medicaginis	flower bud
	Dasineura medicaginis	leaf bud
	Jaapiella medicaginis	folded leaflet
Pisum sativum	*Contarinia pisi*	flower, leaf bud, pod
Fruit trees and shrubs		
Malus domestica	*Dasineura mali*	leaf
	Resseliella oculiperda	stem
Prunus domestica	*Asphondylia pruniperda*	leaf bud
	Dasineura tortrix	leaf bud
	Putoniella pruni	leaf
Prunus cerasus	*Lasioptera cerasiphera*	fruit
Pyrus communis	*Contarinia pyrivora*	fruit
	Dasineura pyri	leaf
	Resseliella oculiperda	stem
Ribes	*Dasineura tetensi*	leaf bud
Rubus	*Contarinia rubicola*	flower bud
	Dasineura plicatrix	leaf
	Lasioptera rubi	stem
	Resseliella theobaldi	stem

Dasineura napi (*D. brassicae*) (Brassica Pod Midge) is a serious pest of rape in rape-growing areas. The main host plant is *Brassica napus*, less important *Brassica oleracea* and other species of the genus *Brassica*. *D. napi* is usually a secondary pest because the females lay their eggs in the holes made on siliquas by the weevil, *Ceuthorhynchus obstrictus* (MARSHAM, 1792). The importance of *D. napi* as a pest has increased considerably in the last ten years due to the greatly increased area planted with rape.

The agricultural importance of *D. napi* was studied mostly by SPEYER (1954), BUHL (1957b, 1960) and KÜHNE 1967 in northern Germany and by NOLTE & FRITSCHE (1954) in central Germany. WAEDE (1961) studied the possibilities of pest control and SCHÜTTE (1978) the use of growth regulators to control this pest. Various field experiments were conducted to compare the effects of different crop management procedures on the occurrence of *D. napi* (BÜCHS 2009, BÜCHS & KATZUR 2004, WEBER & BÜCHS 2000). Information on the effect of epigeic predators on the survival of gall midge larvae in the soil is published by BÜCHS & NUSS (2000).

Contarinia nasturtii (Swede Midge) is a polyphagous species feeding on various species and genera of the family Brassicaceae, in particular, cultivated varieties of *Brassica napus*. Larvae attack various organs of the host plants: young leaves, buds and flowers. It is a minor pest, mainly on heavy clay soils. In Germany the occurrence and importance of this species was studied by NOLL (1959a, 1959b), NOLL et al. (1942), HORNIG (1953), MEYER (1954) and NOLTE (1954b). The damage caused by this species has increased considerably over the last fifty years (KOCH & GEMMAR 2002; GEMMAR & KOCH 2002).

Contarinia medicaginis (Lucerne Flower Midge) is the main species of gall midges damaging alfalfa (*Medicago sativa*). Larvae of this species develop in flower buds. In Germany damages were studied mainly by LEHMANN (1934, 1949), BOLLOW (1954), FRÖHLICH (1958b, 1960) and WEIGAND (1960).

Dasineura medicaginis (*D. ignorata*), which induces onion-shaped swellings on the main or side shoots of alfalfa, and *Jaapiella medicaginis*, which produces inconspicuous galls on folded leaflets, usually occur together with the previous species (LEHMANN (1934, 1949). The population densities of *Dasineura medicaginis* and *Jaapiella medicaginis* are low and they do not seriously damage their host plants.

Contarinia pisi (the Pea Gall Midge), which develops in the flower buds and pods of *Pisum sativum*, is a potential pest in areas where peas are grown intensively. It seems that in Germany this species is not an important pest in contrast to Switzerland, where it was a serious pest in the past (KUTTER 1934).

Fruit trees and shrubs

Thirteen species of gall midges are recorded as pests of fruit trees and shrubs in Germany. Apple- and pear trees (*Malus domestica* and *Pyrus communis*) are attacked by four species of gall midges. The most important pest is *Contarinia pyrivora* (the Pear Midge). Its larvae develop in young fruits of *Pyrus communis*, causing the production of malformed fruits (CATONI 1929, FRÖHLICH 1960).

Several shrubs belonging to the Rosaceae are attacked by larvae of *Resseliella oculiperda* (*Thomasiniana oculiperda*), a polyphagous species developing mainly on species of *Rosa*, but also on *Malus domestica*, *Pyrus communis* and other fruit trees. It can be a serious pest, especially of apples and roses, by preventing the uniting of the stock with the scion after grafting. This species was discovered in Germany and its economic importance was described by LÜSTNER (1931).

Larvae of *Dasineura pyri* cause galls mainly on young leaves of young shoots of *Pyrus communis* and larvae of *Dasineura mali* on young leaves of *Malus domestica*. Neither of these species are economically important.

Lasioptera cerasiphera attacks the fruit of *Prunus cerasus* (*Cerasus vulgaris*). It was discovered at Kleinmachnow near Berlin by GOTTWALD (1989) and described by STELTER (1990a).

The gall midges associated with *Prunus domestica* (*Asphondylia pruniperda, Dasineura tortrix* and *Putoniella pruni*), with *Ribes nigrum* (*Dasineura tetensi*) and with *Rubus* spp. (*Contarinia rubicola, Dasineura plicatrix, Lasioptera rubi*) are currently not economically important.

Resseliella theobaldi (*Thomasiniana theobaldi*), Raspbery Cane Midge, is the most important gall midge pest of raspberry. It causes serious damage to raspberry stems, which sometimes results in the terminal ends of attacked shoots dying. It occurs mainly in northern Europe and has been studied in Germany by FRITZSCHE (1957, 1958) and GRÜNWALD & SEEMÜLLER (1979).

Forest pests

There is a useful overview of the species of gall midges occurring on economically important forest trees in Europe published by POSTNER (1982). Currently 17 species of gall midges are recorded attacking forest trees in Germany (Table 7).

Table 7: Species of gall midges injurious to forest trees in Germany

Tree species	Species of gall midge	Damaged part
Coniferous trees		
Abies alba	*Paradiplosis abietispectinatae*	needle
	Resseliella piceae	seed
Larix decidua	*Dasineura kellneri*	bud
	Resseliella skuhravyorum	seed (not recorded in Germany)
Picea abies	*Plemeliella abietina*	seed
Pinus	*Contarinia baeri*	needle
	Thecodiplosis brachyntera	needle
Taxus baccata	*Taxomyia taxi*	bud
Broad-leaved trees and shrubs		
Acer pseudoplatanus	*Acericecis vitrina*	leaf
	Dasineura irregularis	bud
	Drisina glutinosa	leaf
Fagus sylvatica	*Contarinia fagi*	bud
	Mikiola fagi	leaf
Fraxinus excelsior	*Dasineura fraxinea*	leaf
	Dasineura fraxini	leaf
Quercus robur	*Contarinia quercina*	bud
	Resseliella quercivora	stem, branch
Salix, various species	*Rabdophaga* (various species)	various parts

Coniferous trees

Eight species of gall midges are pests of coniferous trees in Germany, occurring locally from time to time. Some of them extensively damage their host plants.

Larvae of *Paradiplosis abietispectinatae* (*Agevillea abietis*) damage needles of *Abies alba* in western Europe and Germany (POSTNER 1957, 1959a, 1959b, 1960a, 1960b, 1960c, 1962b, 1973a, 1973b, 1973c). Currently this species does not harm its host plant and it is even difficult to find its galls in forest areas.

Larvae of *Resseliella piceae* develop in the seeds of *Abies alba* and those of *Plemeliella abietina* in the seeds of *Picea abies*. Both species do not seem to be important pests in Germany, but are serious pests in Poland (SKRZYPCZYŃSKA 1996, SKRZYPCZYŃSKA et al. 1990).

Dasineura kellneri (the Larch bud Midge), whose larvae produce gall lateral needle buds of *Larix decidua*, was a pest in Germany in the past (LANFER 1933, SCHREMMER 1959, POSTNER 1962a, 1963).

Larvae of *Resseliella skuhravyorum* develop in the cones of *Larix decidua*. This species has not been recorded in Germany, but is present in all the surrounding countries and is also likely to occur in Germany.

Thecodiplosis brachyntera (Needle Shortening Gall Midge) was discovered and described in Germany by SCHWÄGRICHEN (1835). Solitary larvae of this species develop at the base of pairs of needles of *Pinus sylvestris, Pinus mugo* and *Pinus rotundata*. In the autumn attacked needles change in colour first to yellow and then brown before dropping to the soil. *T. brachyntera* is recorded as a pest in many areas of Germany since 1840 (ECKSTEIN 1925, ESCHERICH 1925, TUBEUF 1932, FANKHÄNEL 1962, FRIEDERICHS & WINTER 1987, WINTER 1989, SKUHRAVÝ 1991).

Contarinia baeri (Needle-bending Pine Gall Midge) was described in 1931 as *Itonida baeri* by PRELL (1931), who discovered damaged needles of *Pinus sylvestris* in the forest of Tharandt near Dresden. Pairs of needles attacked by larvae bend downwards at the base, turn yellow in August and fall prematurely. An outbreak was recorded in Lower Saxony (Germany) from 1981-1984 (FRIEDERICHS & WINTER 1987, WINTER 1989).

Larvae of *Taxomyia taxi* (the Yew Gall Midge) induce the development of rosette galls on branches of *Taxus baccata* and occurs at several localities in Germany (POSTNER 1982).

Broad-leaved trees and shrubs

More than 50 species of gall midges develop on broad-leaved trees in Germany. Their larvae cause galls on leaves, buds, flowers and shoot tips. Usually these species are mentioned in handbooks of forest entomology, but their damage to trees and shrubs is not serious. Only a few of them become locally abundant from time to time under favourable conditions. Usually these local outbreaks only last for one year.

Contarinia fagi (the Beech Bud Gall Midge) can be an important pest. Larvae mainly damage leaf buds of 1-3 year old *Fagus sylvatica* seedlings growing in forest nurseries and hedges. Damage caused to young beech trees was first recorded at Garmisch-Partenkirchen (Upper Bavaria) and the species was described by RÜBSAAMEN (1921). After an attack, new shoots develop from axillary buds, resulting in the development of a deformed tree (FISCHER 1939). Severe damage to mature beech trees, caused by *C. fagi*, was recorded by HOLIGHAUS & LUNDERSTÄDT (2009) at Hannoversch Münden (Südniedersächsisches Bergland).

Mikiola fagi (Beech Leaf Gall Midge) induces the development of large pointed galls on the upper surface of leaves of *Fagus sylvatica*. It was first described by HARTIG (1839). It may occur as a pest, locally and occasionally, especially of young trees growing in sub-

montane and montane zones (SKUHRAVÁ & ROQUES 2000). An outbreak of *M. fagi* on beech trees occurred at Allgäu (Swabia, Bavaria) in 1941 (HOLDHEIDE 1942).

Acericecis vitrina, *Dasineura irregularis* and *Drisina glutinosa* are associated with *Acer pseudoplatanus*. If these gall midges occur abundantly they cause severe damage to sycamore leaves. An outbreak of *Acericecis vitrina* was recorded in the Bavarian Forest in 1991 by SKUHRAVÁ & SKUHRAVÝ (1992b).

Dasineura fraxinea, causing pustule galls on the leaflets of *Fraxinus excelsior*, was recorded as a harmfull species in 1905 by BAER (1907). Attacked leaves dry out and are shed prematurely. Galls of this species can be easily found in the field along with galls on the midvein, caused by *Dasineura fraxini*, but in both cases only in small numbers.

Contarinia quercina develops in the apical and axial buds of young oak trees causing malformation of young leaves and a reduction in growth. It occurs mainly in forest nurseries and does not injure older oak trees (SKUHRAVÁ & ROQUES 2000).

Resseliella quercivora develops in cambial necroses („oak canker") and in the bark or timber of damaged trunks of young oak trees and in the upper branches of older trees of *Quercus robur* and *Q. petraea*. This species was abundant at Rottenburg am Neckar in southern Germany and its biology, ecology, occurrence, distribution and harmfulness there has been studied in detail by DENGLER (2004).

Several species of gall midges are associated with various species of *Salix*. Some of them may be pests (SCHOLZ-GÜNTER 1957, KRÄMER 1958). KOPELKE & AMENDT (2002) record 14 species of gall midges causing galls on willows growing on flood planes of the River Rhine.

Beneficial species

Several species of gall midges can be useful in the biological control of weeds, for example, *Bayeriola salicariae* against *Lythrum salicaria* (BLOSSEY & SCHROEDER 1995).

Some larvae of zoophagous gall midges are useful as predators in pest control. They suck the body fluids from their prey, e.g. small aphids, mites, coccids, psyllids, thrips and other small invertebrates. In greenhouses, the predators *Aphidoletes aphidimyza* and *Feltiella acarisuga* are used as biological control agents of aphids and mites, and since 1970 particularly for controlling *Myzus persicae* SULZER, 1776 infesting sweet peeper (*Capsicum annuum*), cucumber, tomato and various vegetable and ornamental crops (WILBERT 1970, 1972, 1973, MAYR 1973, FAHLE & RICHTER 1990, ALBERT 1992, ALBERT & SCHNELLER 1991). The most efficient treatment was a combination of *Aphidoletes aphidimyza* a few days after releasing the Hymenopteran parasitoid *Aphidius colemani* VIERECK, 1912 (WIETHOFF et al. 2002) and the predator *Chrysoperla carnea* (STEPHENS, 1836) (QUENTIN et al. 1995, SCHMIDT et al.1989, LAMPARTER 1992).

Alien species

Invasive species are alien species that modify ecosystems, habitats, or species compositions. In Germany five alien species of gall midges are recorded (SKUHRAVÁ et al. 2010).

Contarinia quinquenotata, which damages flower buds of *Hemerocallis fulva*, originated from temperate Asia. It was first reported in Germany by WEIDNER (1952).

Dasineura gleditchiae, which causes pod-like galls on leaflets of *Gleditsia triacanthos*, originated from North America and was first recorded in the Netherlands in 1975. This species was first recorded in Germany in arboricultures near Berlin by STELTER (1990b). Currently it is widely distributed in Europe (MIHAJLOVIC & GLAVENDEKIC 2010).

Cupressatia siskiyou (*Janetiella siskiyou*), which develops among the scales of cones of *Chamaecyparis lawsoniana*, originated from North America and was first recorded in Germany by STELTER (1978b).

Obolodiplosis robiniae, which develops in rolled up margins of leaflets of *Robinia pseudoacacia*, originated from North America and was first recorded in Italy by DUSO & SKUHRAVÁ (2003). Currently this species ranges from Great Britain in the west to Donetsk in eastern Ukraine and from southern Italy to southern Sweden (SKUHRAVÁ et al. 2007, SKUHRAVÁ 2010). At the beginning it was abundant in many places and now (several years after the first European records) it is uncommon. The reason for this decrease in abundance is probably a high parasitization by the hymenopteran endoparasitoid *Platygaster robiniae* NEERUP-BUHL & DUSO, 2008, which was recorded several years after the introduction of this species into Europe. In Germany *O. robiniae* was first recorded in 2006 (BATHON 2007, HOFFMANN et al. 2007, WEHRMAKER 2007).

Rhopalomyia chrysanthemi, which develops inside small galls on leaves, stems, buds or flowerheads of commercial cultivars of *Chrysanthemum* spp., is a widespread species of unknown origin, probably Asia. First occurrence in Germany was reported by BEHR (1949).

5.8 Occurrence of gall midges in German federal states

Although the gall midge fauna of Germany is the richest in terms of species in Europe (SKUHRAVÁ & SKUHRAVÝ 2010a), it has been studied very unevenly and gall midge species do not occur equally throughout Germany. Most of the studies on gall midges were done in Schleswig-Holstein, Mecklenburg-Western Pomerania, Brandenburg, Hesse, North Rhine-Westphalia, Saxony-Anhalt, Saxony, Thuringia and Bavaria. This is probably because there are several universities, museums and other research institutions, which increases the possibilities to organise faunal investigations. On the other hand, few studies have been done in the western parts of Germany: Lower Saxony, Rhineland-Palatinate, Saarland and Baden-Württemberg (Fig. 8).

Occurrence of gall midges in different federal states of Germany is given in Table 8, species richness and species densities in Table 2.

The highest number of species of gall midges (358 species) and highest species density (155 species per 1000 km²) is recorded in Brandenburg/Berlin, the lowest number of species in Saarland (83 species) and the lowest species density in Baden-Württemberg (58 species per 1000 km²). Fifteen species of gall midges could not be assigned to particular federal states because their locality in Germany was not recorded.

Baden-Württemberg (BW)

HIERONYMUS (1890) recorded galls of 14 gall midge species, V. LAGERHEIM (1903) 14 species in the mountains of Feldberg, JAAP (1923) 70 species in Weinheim an der Bergstraße and its surroundings, ENGEL & WEIDNER (1952) 2 species in the mountains of Kaiserstuhl, PFÜTZENREITER & WEIDNER (1958) 8 species in Ludwigsburg and BOGENSCHÜTZ (2006) 4 species in the mountains of Schönberg. Altogether there are 139 gall midge species recorded for this state and density is 58 species per 1000 km².

Bavaria (BA)

HIERONYMUS (1890) recorded galls of 9 species, ROSS (1916) 123 species, ROSS (1922c) 174 species, TOEPFFER (1918) 18 species in Upper Bavaria, JAAP (1919) 58 species also in Upper Bavaria and later JAAP (1920) 37 species at Obersdorf (Alps in the Allgäu). WENGEMAYR (1931) records galls of 130 species in Swabia, WEIDNER (1950) 28 species in Franconia,

WEIDNER & WEIDNER (1951) 103 species in Lower Franconia, WEIDNER (1962) 21 species in the mountains of Romberg, MÖHN (1954, 1955a, 1955b, 1955c, 1955d, 1958, 1961b) 18 species, HOLZ (1970) 10 species mainly in the surroundings of Erlangen, HUBER (1969a, 1969b) 156 species in Swabia and 3 in Middle Franconia, HUBER (1974) 12 species in Swabia, ESCHELMÜLLER & KLEMENT (1974) 21 species in the Alps in the Allgäu, KLEMENT (1977) 13 species in the mountains of Sulzberg and its surroundings, KLEMENT & ESCHELMÜLLER (1978) 22 species in the same area, SCHRÖPPEL (1980, 1981, 1982, 1983, 1984) 94 species in the Alps in the Allgäu, BRAUN (1983) 7 species at Murnauer Moos near Garmisch-Partenkirchen, SKUHRAVÁ & SKUHRAVÝ (1992a) 69 species in the Fichtelgebirge and SKUHRAVÁ & SKUHRAVÝ (1992b) 29 species in the Bayerischer Wald. Altogether there are 328 species of gall midges recorded for this state and density is 113 species per 1000 km².

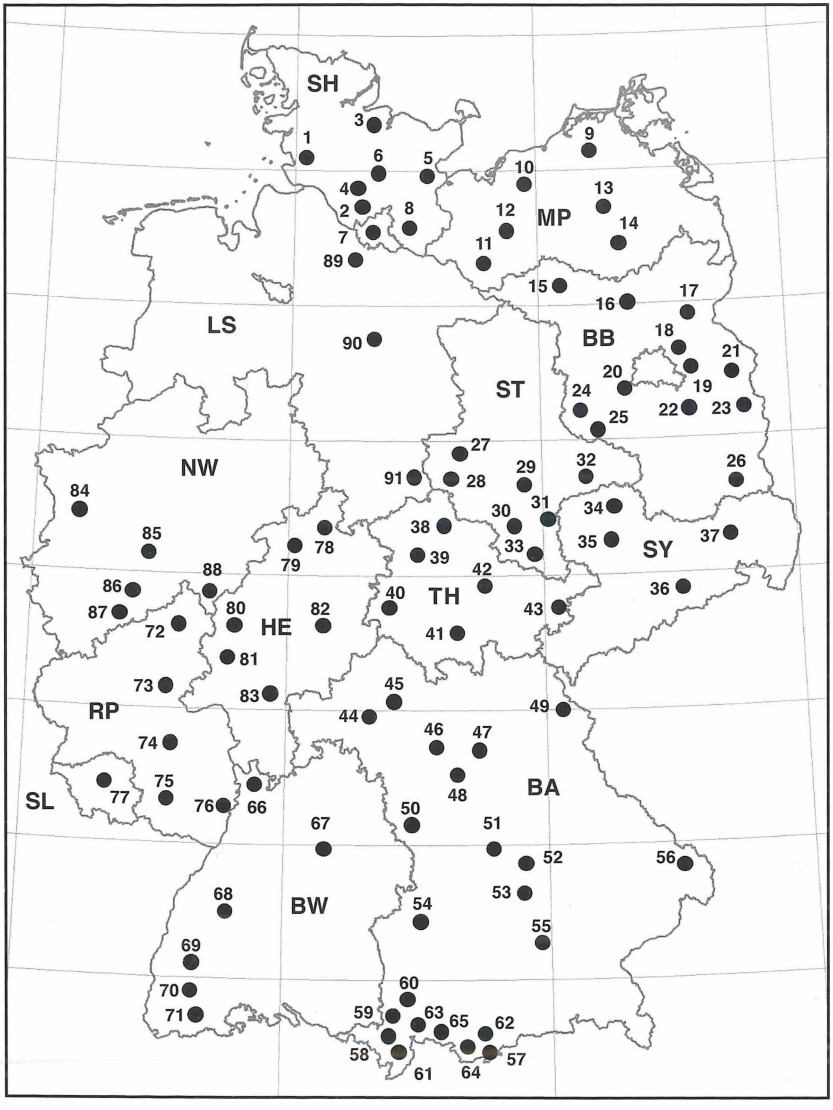

Fig. 8. Germany with localities or areas where the faunistic investigations of gall midges (Cecidomyiinae) were carried out by various researchers and collectors. Schleswig-Holstein (SH): 1 – Meyer, 2 – Kröber, 3 – Segebade & Schaefer, 4 – Schleicher, 5 – Benick, 6 – Pichinot & Meyer, 7 – Beuthin, 8 – Jaap; Mecklenburg-Western Pomerania (MP): 9 – Stelter, 10 – Buhr, 11 – Kruse, 12 – Hedicke, 13 – Schleicher, 14 – Haase & Utech; Brandenburg & Berlin (BB): 15 – Jaap, 16 – Jaap, 17 – Hedicke, 18 – Rübsaamen, 19 – Buhr, 20 – Hieronymus, 21 – Ross, 22 – Schulze, 23– Loew, 24 – Zeller, 25 – Reimers, 26 – Kwast; Saxony-Anhalt (ST): 27 – Hieronymus, 28 - Skuhravá & Skuhravý, 29 – Utech, 30 – Kühlhorn, 31 – v. Schlechtendal, 32 – Kwast, 33 – Lange; Saxony (SY): 34 – Kwast, 35 – Buhr, 36 – Hieronymus, 37 – Berger; Thuringia (TH): 38 – Ludwig, 39 – Buhr, 40 – Oschmann, 41 - Hieronymus, 42 – Jaap, 43 - Kwast; Bavaria (BA): 44 - Weidner & Weidner, 45 - Weidner, 46 – E. Weidner, 47 – Möhn, 48 – Holz, 49 - Skuhravá & Skuhravý, 50 – Huber, 51 – Ross, 52 – Hieronymus, 53 – Ross, 54 – Huber, 55 – Ross, 56 - Skuhravá & Skuhravý, 57 – Toepfer, 58 - Eschelmüller & Klement, 59 - Klement & Eschelmüller, 60 – Wengemayr, 61 – Jaap, 62 – Braun, 63 – Schröppel, 64 – Jaap, 65 – Schröppel; Baden-Württemberg (BW): 66 – Jaap, 67 - Pfützenreiter & Weidner, 68 – Hieronymus, 69 – Bogenschütz, 70 - Engel & Weidner, 71 – Lagerheim; Rhineland-Palatinate (RP): 72 – Rübsaamen, 73 – Niessen, 74 - Geisenheyner, 75 - Staudt , 76 – Skuhravá; Saarland (SL): 77 – Staudt; Hesse (HE): 78 – Lehmann, 79 - Lehmann & Flügel, 80 – Maresquelle, 81 – Möhn, 82 – Bromm, 83 – Sack; North Rhine-Westphalia (NW): 84 – Winnertz, 85 – Dreweck , 86 – Ludwig, 87 – Niessen, 88 – Rübsaamen; Lower Saxony & Bremen (LS): 89 – Schleicher, 90 – Hieronymus, 91 - Skuhravá & Skuhravý (base map: Bundesamt für Kartographie und Geodäsie, Frankfurt/Main, 2011).

Brandenburg & Berlin (BB)

Loew (1850) recorded galls of 14 species in Guben, Hieronymus (1890) 48 species and Rübsaamen (1892a) 15 species in Berlin and its surroundings, Hedicke (1917b, 1917-1918) 127 species and Schulze (1918) 83 species in "Mark Brandenburg", Jaap (1918) 167 species in Triglitz/Prignitz and its surroundings, Jaap (1922) 138 species in Havelland, Ross (1922d) 24 species, Zeller (1940, 1941, 1942) 56 species in e.g. Hoher Fläming, Buhr H.J. (2005) 7 species at Biesenhorster Sand near Berlin and Kwast (unpublished, 2012) 49 species mainly in the surroundings of Spremberg (Brandenburg). Schumann (2011) compiled a list with 206 species of Cecidomyiinae found in Berlin und Brandenburg, based on the collections in the "Museum für Naturkunde Berlin" and on data in the literature. Altogether there are 358 species of gall midges recorded for this state and density is 155 species per 1000 km².

Hesse (HE)

Sack (1907) recorded galls of 42 species in the surroundings of Frankfurt am Main, Maresquelle (1931) 41 species in Giessen, Möhn (1955a, 1955b, 1955d, 1961b) 88 species in the Taunus, Bromm (1964) 55 species in Naturpark Hoher Vogelsberg, Lehmann (2007) 16 species in the Fuldatal and Lehmann & Flügel (2012) 21 species near Gombeth. In total, 207 species of gall midges are recorded for this state and density is 71 species per 1000 km².

Lower Saxony & Bremen (LS)

Hieronymus (1890) recorded galls of 26 species, Schleicher in Kröber (1935) 76 species and Skuhravá & Skuhravý (1988) 90 species in the Harz (only partially situated in Lower Saxony). In total, 117 gall midge species are recorded for this state and density is 45 species per 1000 km².

Table 8: Occurrence of gall midges in the federal states. Abbreviations: NS: number of federal states, abbreviations of of federal states listed in table 2.

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Acericecis campestre	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Acericecis vitrina	+	.	+	.	+	.	+	+	.	+	+	+	+	9
Acodiplosis inulae	.	+	.	.	.	+	.	.	+	.	+	.	.	4
Amerhapha gracilis	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Ametrodiplosis auripes	+	+	+	.	.	.	.	.	.	.	.	.	.	3
Ametrodiplosis crassinerva	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Ametrodiplosis duclosii	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Ametrodiplosis thalictricola	+	+	.	.	+	+	+	.	+	.	.	.	+	7
Anabremia bellevoyei	+	+	.	.	.	+	+	.	.	.	.	.	.	4
Anabremia massalongoi	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Anisostephus betulinus	+	+	.	.	.	+	+	+	+	+	.	+	.	8
Anthodiplosis rudimentalis	.	.	.	.	.	+	+	.	.	.	.	.	.	2
Antichiridium caricis	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Antichiridium striatum	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Aphidoletes abietis	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Aphidoletes aphidimyza	+	+	.	+	+	+	+	.	+	.	+	.	.	8
Aphidoletes thompsoni	+	.	.	.	.	.	.	.	+	.	.	.	.	2
Aphidoletes urticaria	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Apiomyia bergenstammi	.	.	.	.	.	.	.	.	.	.	.	+	.	1
Arnoldiola gemmae	.	+	.	+	.	.	.	.	.	.	.	.	.	2
Arnoldiola libera	.	+	.	.	.	.	.	.	.	.	+	+	.	3
Arnoldiola quercus	.	+	+	.	.	.	+	.	.	.	.	.	.	3
Arnoldiola sambuci	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Arthrocnodax incanus	.	+	.	.	.	.	+	.	.	.	.	.	.	2
Arthrocnodax jaapi	+	+	.	.	.	.	.	.	.	.	.	.	.	2
Arthrocnodax mali	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Arthrocnodax minutus	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Arthrocnodax peregrinus	.	.	.	+	.	.	+	.	+	.	.	.	.	3
Arthrocnodax vitis	.	+	.	.	.	.	.	+	.	.	.	.	.	2
Arthrocnodax wissmanni	.	.	.	+	.	.	.	+	.	.	.	.	.	2
Aschistonyx carpinicolus	+	+	.	+	+	+	.	+	+	.	+	.	.	8
Asphondylia baudysi	+	.	.	.	.	.	+	.	.	.	+	.	.	3
Asphondylia coronillae	+	.	.	.	.	.	.	+	.	.	.	.	.	2
Asphondylia cytisi	.	.	.	.	.	.	.	.	+	.	+	.	.	2
Asphondylia echii	+	.	.	+	.	.	.	.	.	.	+	+	.	4
Asphondylia ervi	.	+	.	+	.	.	.	+	.	.	.	.	+	4
Asphondylia genistae	+	.	.	+	.	+	.	.	.	.	+	.	.	4
Asphondylia hornigi	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Asphondylia lathyri	.	.	.	+	.	.	.	.	.	.	.	.	.	1
Asphondylia lupulinae	.	.	.	.	.	.	.	.	.	.	.	+	+	2
Asphondylia melanopus	+	+	.	+	.	.	.	.	+	.	.	.	.	4
Asphondylia menthae	.	.	.	.	.	.	.	.	.	.	.	+	.	1
Asphondylia miki	+	.	.	.	.	.	.	.	.	.	+	.	+	3
Asphondylia ononidis	+	.	.	+	.	.	.	.	.	.	+	+	+	5
Asphondylia pilosa	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Asphondylia pruniperda	+	+	.	.	.	+	+	+	.	.	+	+	.	7

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Asphondylia sarothamni	+	+	+	+	+	+	+	+	+	+	.	+	+	12
Asphondylia scrophulariae	.	.	+	.	.	.	.	.	.	.	.	+	+	3
Asphondylia serpylli	+	.	.	.	.	.	.	.	.	.	.	+	.	2
Asphondylia verbasci	.	.	+	.	.	.	.	.	+	.	+	+	+	5
Atrichosema aceris	+	+	.	+	.	.	+	.	+	.	+	+	+	8
Bayeriola buhri	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Bayeriola erysimi	+	+	.	.	.	.	.	.	.	.	.	.	+	3
Bayeriola salicariae	.	.	+	+	+	+	.	.	+	.	.	.	.	5
Bayeriola thymicola	+	.	.	.	.	+	+	.	+	.	.	+	+	6
Blastodiplosis artemisiae	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Blastomyia origani	.	.	.	.	.	.	.	.	.	.	+	.	.	1
Brachineura maura	.	.	.	.	.	.	.	+	+	.	.	.	.	2
Brachineura squamigera	.	.	.	.	.	.	+	.	+	.	.	.	.	2
Brachineura stygia	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Brachydiplosis caricum	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Bremia cilipes	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Bremia decorata	.	.	.	.	.	.	.	+	.	+	.	.	.	2
Bremiola onobrychidis	+	+	.	.	.	+	.	.	.	.	+	.	+	5
Buhriella rubicola	.	.	.	.	+	+	.	.	.	.	.	+	.	3
Buhromyiella giganteosaetosa	.	.	+	.	.	.	.	.	.	.	.	.	+	2
Camptodiplosis boleti	.	.	+	.	.	.	.	+	.	.	.	.	.	2
Cecidomyia magna	+	.	.	+	.	.	.	.	.	.	.	.	.	2
Cecidomyia pini	.	+	.	+	.	.	.	.	+	.	.	.	.	3
Clinodiplosis botularia	.	+	.	.	.	+	+	.	.	.	.	.	.	3
Clinodiplosis cilicrus	+	+	.	+	+	.	+	+	+	+	+	+	.	10
Clinodiplosis cingulata	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Clinodiplosis invocata	.	.	.	.	.	+	+	.	.	.	.	.	.	2
Clinodiplosis latibulorum	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Clinodiplosis mutabilis	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Clinodiplosis oleracei	+	+	.	.	.	.	.	.	.	.	+	.	.	3
Clinodiplosis socialis	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Coniophora autumnalis	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Contarinia acerplicans	+	.	.	.	.	+	+	.	+	+	.	.	+	6
Contarinia acetosellae	.	+	.	+	.	.	+	.	.	.	.	.	.	3
Contarinia aconitifloris	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Contarinia acrocecis	.	.	.	.	.	+	.	.	.	.	.	.	+	2
Contarinia aequalis	+	+	+	.	.	.	+	+	.	.	+	.	+	7
Contarinia anthobia	.	+	.	.	.	.	+	+	+	.	.	.	.	4
Contarinia anthonoma	+	+	.	.	.	.	.	.	.	.	.	.	.	2
Contarinia anthophthora	.	+	.	.	.	.	.	.	+	.	.	+	.	3
Contarinia artemisiae	.	+	.	.	.	+	.	.	+	.	.	.	.	3
Contarinia asclepiadis	.	.	.	.	.	.	.	.	.	.	.	+	+	2
Contarinia baeri	+	+	.	.	+	.	.	.	.	.	.	+	.	4
Contarinia baggendorfi	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Contarinia ballotae	.	+	+	.	.	.	.	.	.	.	+	.	+	4
Contarinia barbichei	+	+	.	+	.	+	.	.	+	.	.	+	+	7
Contarinia campanulae	+	.	.	.	.	.	.	.	+	.	+	.	+	4
Contarinia carpini	+	+	.	.	.	.	+	.	+	.	+	+	.	6

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Contarinia chrysanthemi	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Contarinia convallariae	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Contarinia coryli	+	+	+	.	.	+	+	+	+	+	+	+	+	11
Contarinia craccae	+	+	.	.	.	+	.	.	+	+	.	+	+	7
Contarinia crispans	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Contarinia dactylidis	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Contarinia digitata	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Contarinia dipsacearum	+	+	.	+	.	.	.	.	+	.	.	.	.	4
Contarinia echii	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Contarinia fagi	+	+	.	+	+	+	+	.	+	.	+	.	+	9
Contarinia festucae	+	.	.	.	.	.	.	.	+	.	.	.	.	2
Contarinia floricola	+	.	.	.	.	+	.	.	+	.	.	+	+	5
Contarinia floriperda	.	+	.	.	.	+	.	.	+	.	.	.	.	3
Contarinia florum	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Contarinia galeobdolontis	+	.	.	.	.	.	+	.	.	.	.	+	.	3
Contarinia gei	+	+	.	.	.	+	.	.	+	.	.	+	+	6
Contarinia heraclei	+	+	.	.	.	.	.	.	+	.	.	.	.	3
Contarinia hyperici	.	.	.	.	.	+	.	.	.	.	+	.	+	3
Contarinia hypochoeridis	.	+	.	+	.	+	+	+	+	.	.	.	.	6
Contarinia inquilina	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Contarinia inulicola	.	.	.	.	.	+	.	.	.	.	.	.	+	2
Contarinia jaapi	.	+	.	.	.	+	.	.	+	.	.	.	.	3
Contarinia jacobaeae	+	+	+	+	.	+	+	.	+	+	.	+	.	9
Contarinia kiefferi	.	.	.	.	.	.	.	.	.	.	.	+	.	1
Contarinia lamii	.	.	.	.	.	.	.	.	.	.	+	.	.	1
Contarinia lamiicola	+	+	.	.	.	.	.	.	.	.	+	.	+	4
Contarinia lathyri	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Contarinia lilii	+	.	+	.	.	.	.	.	+	.	.	.	+	4
Contarinia lonicerearum	+	+	.	.	.	+	+	.	+	.	+	+	+	8
Contarinia loti	+	+	+	+	+	+	+	+	+	.	+	+	+	12
Contarinia lysimachiae	+	+	.	.	.	.	.	.	+	.	.	.	.	3
Contarinia majanthemi	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Contarinia marchali	+	+	.	.	.	.	.	.	.	.	.	+	.	3
Contarinia martagonis	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Contarinia medicaginis	+	+	+	+	.	+	+	+	+	.	+	+	+	11
Contarinia melanocera	+	+	+	+	.	+	.	.	.	.	.	+	.	6
Contarinia merceri	.	.	+	.	.	.	.	.	.	.	.	+	.	2
Contarinia molluginis	+	+	.	.	.	+	+	.	.	.	.	.	.	4
Contarinia nasturtii	+	+	+	+	+	+	+	+	+	.	+	+	+	12
Contarinia nicolayi	+	+	+	.	.	+	+	.	+	.	+	+	+	9
Contarinia onobrychidis	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Contarinia ononidis	+	.	.	.	.	.	.	.	+	+	+	.	.	4
Contarinia pastinaceae	+	+	+	.	.	.	+	.	.	.	.	.	.	4
Contarinia petioli	+	+	.	+	+	+	+	+	+	+	+	+	+	12
Contarinia picridis	+	.	+	.	.	.	.	+	.	.	.	.	+	4
Contarinia pilosellae	+	+	.	+	.	+	+	.	+	.	+	+	+	9
Contarinia pisi	.	+	.	+	.	+	.	.	+	.	.	+	+	6
Contarinia polygonati	+	+	.	.	.	.	.	.	.	.	.	.	.	2
Contarinia populi	+	+	.	.	.	.	+	+	.	.	+	+	+	7

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Contarinia pulchripes	.	+	.	+	.	.	.	.	+	.	.	.	.	3
Contarinia pyrivora	.	+	.	+	.	+	+	+	+	.	.	+	+	8
Contarinia quercina	+	+	+	.	.	+	+	.	+	.	+	.	.	7
Contarinia quinquenotata	+	+	+	.	.	.	.	.	+	.	.	.	.	4
Contarinia ramicola	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Contarinia rhamni	.	+	.	.	.	+	+	.	.	.	.	.	.	3
Contarinia ribis	+	.	.	.	.	.	+	.	.	.	.	.	+	3
Contarinia rubicola	.	.	.	+	.	.	+	+	.	.	.	.	+	4
Contarinia rumicis	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Contarinia sambuci	.	+	+	+	.	+	+	.	+	.	+	.	+	8
Contarinia scabiosae	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Contarinia schlechtendaliana	.	.	.	.	.	.	.	+	+	.	+	.	.	3
Contarinia scoparii	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Contarinia scrophulariae	+	.	+	+	.	+	+	.	+	+	+	.	+	9
Contarinia scutati	.	+	.	.	.	.	.	+	.	.	.	.	.	2
Contarinia silvestris	.	.	.	.	.	+	.	.	+	.	.	.	.	2
Contarinia solani	.	+	.	.	.	+	.	.	+	.	+	.	.	4
Contarinia sorbi	+	+	.	+	+	+	+	.	+	.	+	+	+	10
Contarinia steini	+	+	+	.	.	+	+	.	+	.	+	+	.	8
Contarinia subulifex	.	.	.	+	.	.	.	.	.	.	.	.	.	1
Contarinia tanaceti	+	.	.	.	.	.	+	.	+	.	+	.	.	4
Contarinia thlaspeos	.	+	.	.	.	+	.	+	.	.	.	+	.	4
Contarinia tiliarum	+	+	+	+	+	+	+	+	+	.	+	+	+	12
Contarinia tragopogonis	+	.	.	.	.	+	.	.	.	.	.	.	.	2
Contarinia tremulae	.	.	.	.	.	.	.	.	.	+	.	.	.	1
Contarinia tritici	+	+	+	+	+	+	+	.	+	+	+	+	+	12
Contarinia umbellatarum	+	+	.	.	.	+	.	.	+	.	.	.	+	5
Contarinia valerianae	+	.	.	+	.	.	+	.	.	.	.	.	.	3
Contarinia variabilis	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Contarinia viburnorum	+	+	.	.	.	.	+	.	.	.	.	+	.	4
Contarinia vincetoxici	+	+	.	.	.	.	.	+	.	.	.	.	+	4
Contarinia viticola	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Coquillettomyia dentata	.	+	.	+	+	.	.	+	+	+	.	.	.	6
Coquillettomyia extensa	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Coquillettomyia lobata	.	+	.	.	+	.	.	.	+	.	.	.	.	3
Coquillettomyia mirifica	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Coquillettomyia umida	.	.	.	+	.	.	.	.	.	.	.	.	.	1
Coquillettomyia uvae	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Craneiobia corni	+	+	+	+	.	+	+	.	+	+	+	+	+	11
Cupressatia siskiyou	.	+	.	.	.	+	.	.	.	.	.	.	.	2
Cystiphora leontodontis	.	.	.	.	.	+	.	.	+	.	.	.	.	2
Cystiphora sanguinea	+	+	+	+	.	+	+	+	+	+	+	+	+	12
Cystiphora schmidti	.	+	+	.	.	+	.	.	.	.	.	.	.	3
Cystiphora scorzonerae	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Cystiphora sonchi	+	+	.	+	+	+	+	.	+	.	+	+	+	10
Cystiphora taraxaci	+	+	.	+	.	+	+	+	+	+	.	+	+	10
Dasineura abietiperda	+	.	.	.	.	.	.	.	+	.	.	.	.	2
Dasineura acrophila	+	+	.	+	.	+	+	+	+	.	+	.	+	9

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Dasineura acuminata	.	.	.	.	.	.	.	.	.	.	+	+	+	3
Dasineura affinis	+	+	.	+	.	+	+	+	+	.	+	+	+	10
Dasineura alopecuri	.	.	+	.	.	.	.	.	+	.	.	+	.	3
Dasineura alpestris	+	+	.	+	.	+	+	.	+	.	.	+	.	7
Dasineura angelicae	.	+	+	+	.	+	.	.	+	.	+	.	.	6
Dasineura aparines	+	+	.	+	+	+	+	+	+	+	.	+	.	10
Dasineura armoraciae	.	+	.	.	.	.	.	+	.	.	.	+	+	4
Dasineura artemisiae	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Dasineura asperulae	+	.	.	.	.	.	.	+	.	.	.	.	+	3
Dasineura astragalorum	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura auricomi	.	.	.	.	.	.	.	.	+	.	.	.	+	2
Dasineura auritae	+	+	.	+	.	+	+	+	+	+	+	+	.	10
Dasineura axillaris	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura berberidis	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura berteroae	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Dasineura bistortae	+	.	+	+	.	+	+	.	+	.	+	+	+	9
Dasineura bupleuri	+	.	.	.	.	.	.	.	.	.	+	.	+	3
Dasineura campanulae	+	.	.	.	.	.	.	+	.	.	.	.	+	3
Dasineura capsulae	+	+	.	.	.	+	+	+	+	.	+	+	+	9
Dasineura cardaminicola	+	.	.	.	.	+	.	.	+	.	+	+	+	6
Dasineura cardaminis	+	+	+	+	.	+	+	+	+	.	.	.	.	8
Dasineura comosae	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Dasineura corniculata	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura corylina	.	+	.	.	.	.	.	+	.	.	.	+	+	4
Dasineura crataegi	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Dasineura cytisi	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura dioicae	+	+	.	+	.	+	.	.	+	.	.	+	.	6
Dasineura dryophila	.	+	+	.	.	.	.	.	.	.	.	.	.	2
Dasineura engstfeldi	+	+	.	+	.	+	+	+	+	.	+	+	.	9
Dasineura epilobii	+	+	.	+	+	+	+	+	+	.	+	+	+	11
Dasineura erigerontis	.	.	.	.	.	+	.	+	.	.	.	.	+	3
Dasineura excavans	.	.	+	.	.	.	.	.	.	.	.	+	+	3
Dasineura fairmairei	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura festucae	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Dasineura filipendulae	.	.	.	.	.	.	.	.	.	.	+	.	.	1
Dasineura foliumcrispans	.	+	.	.	.	.	+	.	.	.	.	.	.	2
Dasineura frangulae	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura fraxinea	+	.	.	.	.	+	.	.	+	.	+	+	+	6
Dasineura fraxini	+	+	.	+	+	+	+	.	+	+	+	+	+	11
Dasineura fructum	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura fusca	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura galiicola	+	+	.	+	+	+	+	.	+	.	+	+	.	9
Dasineura geisenheyneri	+	.	.	.	.	.	.	+	.	.	.	.	+	3
Dasineura gentneri	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Dasineura geranii	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Dasineura glechomae	+	+	.	.	+	+	+	.	+	.	.	.	.	6
Dasineura gleditchiae	.	+	.	.	.	.	.	.	.	.	.	+	.	2
Dasineura glyciphylli	+	.	.	.	.	+	.	+	+	.	.	.	+	5
Dasineura harrisoni	.	+	.	+	.	+	.	.	+	.	+	.	+	6

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Dasineura helianthemi	+	.	.	.	.	.	.	.	.	.	+	.	.	2
Dasineura holosteae	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Dasineura hygrophila	+	+	.	.	.	+	+	+	+	.	+	+	+	9
Dasineura hyperici	+	+	+	+	.	+	+	+	+	.	+	+	+	11
Dasineura inflata	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Dasineura irregularis	+	+	+	+	.	+	+	+	+	+	+	+	+	12
Dasineura kellneri	+	.	.	.	.	+	+	.	.	.	+	+	.	5
Dasineura kiefferi	.	.	.	.	.	.	.	.	.	.	.	+	.	1
Dasineura kiefferiana	+	+	.	+	+	+	+	.	+	+	+	+	+	11
Dasineura kleini	.	+	.	.	.	.	+	.	.	.	.	.	.	2
Dasineura koesterbecki	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Dasineura lamii	+	.	.	.	.	.	.	.	.	.	+	.	.	2
Dasineura lamiicola	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura lathyri	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura lathyricola	+	.	.	.	+	+	+	.	+	.	.	+	.	6
Dasineura lathyrina	+	.	.	.	.	.	+	.	.	.	.	.	.	2
Dasineura leguminicola	.	.	.	.	.	.	.	.	+	.	.	+	.	2
Dasineura linosyridis	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Dasineura lithospermi	+	.	.	.	+	+	.	.	.	.	.	.	+	4
Dasineura loewiana	+	+	.	+	+	+	+	+	+	.	.	+	+	10
Dasineura loewii	+	+	+	.	.	.	.	.	.	.	.	.	+	4
Dasineura lotharingiae	+	+	.	+	+	+	+	.	+	.	.	+	.	8
Dasineura lupulinae	+	+	.	.	.	+	.	.	+	.	+	+	.	6
Dasineura mali	+	+	+	.	.	+	+	.	+	.	+	+	+	9
Dasineura medicaginis	+	+	+	+	+	+	+	+	+	.	+	+	+	12
Dasineura miki	+	.	.	+	.	.	.	.	.	.	.	.	.	2
Dasineura minoterminalis	+	.	.	.	.	+	.	.	.	.	.	+	+	4
Dasineura minungula	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Dasineura myositidis	.	.	.	.	.	+	.	.	.	.	+	.	.	2
Dasineura myrtilli	+	+	.	+	.	+	+	.	+	.	.	+	+	8
Dasineura napi	.	+	.	.	+	+	+	.	+	+	+	+	+	9
Dasineura nervicola	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura odoratae	.	+	.	.	.	+	.	.	.	.	.	.	+	3
Dasineura oxyacanthae	.	.	.	.	.	.	.	+	+	.	+	+	.	4
Dasineura papaveris	.	+	.	.	.	.	+	.	.	.	.	+	.	3
Dasineura peinei	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Dasineura periclymeni	+	+	.	+	+	+	+	.	+	.	+	.	+	9
Dasineura phyteumatis	+	.	.	.	+	.	.	.	.	+	.	+	+	5
Dasineura plicatrix	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Dasineura poae	+	.	.	.	.	.	.	.	+	.	.	+	.	3
Dasineura populeti	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Dasineura potentillae	+	+	.	.	.	+	.	.	.	.	+	+	+	6
Dasineura pratensis	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura praticola	.	.	.	.	.	+	+	.	.	.	.	.	+	3
Dasineura procera	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Dasineura pteridicola	+	+	.	.	+	+	+	.	+	.	.	+	+	8
Dasineura pteridis	+	+	+	.	+	+	+	.	+	+	.	+	.	9
Dasineura pulsatillae	.	+	.	.	.	.	.	.	+	.	.	.	.	2
Dasineura pustulans	+	+	+	+	+	+	+	.	+	+	+	+	+	12

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Dasineura pyri	+	+	.	+	+	+	+	.	+	.	+	+	+	10
Dasineura ranunculi	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Dasineura rapunculi	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Dasineura rosae	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Dasineura rossi	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Dasineura rostratae	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura rubella	+	.	+	.	.	+	.	.	.	.	+	.	+	5
Dasineura ruebsaameni	.	+	.	.	.	+	.	.	.	.	+	.	.	3
Dasineura rumicicola	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Dasineura salviae	.	+	.	.	.	+	.	+	.	.	.	.	.	3
Dasineura sampaina	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura sanguisorbae	+	+	.	.	.	.	+	.	.	.	.	+	+	5
Dasineura saxifragae	.	+	.	.	.	+	.	.	.	.	.	.	.	2
Dasineura schulzei	+	+	.	.	+	.	.	.	.	.	+	.	.	4
Dasineura senecionis	+	+	.	.	.	.	.	.	.	.	.	.	+	3
Dasineura serotina	+	+	.	.	.	.	+	.	+	+	.	+	+	7
Dasineura silvicola	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Dasineura similis	.	+	.	.	.	+	+	+	+	.	.	.	+	6
Dasineura sisymbrii	+	+	+	+	+	+	+	+	+	.	+	+	+	12
Dasineura sodalis	+	.	.	.	.	.	.	.	.	.	+	.	.	2
Dasineura spadicea	+	+	.	+	+	+	.	+	+	.	.	+	+	9
Dasineura spicatae	.	.	.	.	.	.	.	.	.	.	.	+	.	1
Dasineura stellariae	+	.	.	+	.	+	.	.	+	.	.	+	+	6
Dasineura stelteri	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Dasineura strumosa	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Dasineura subterranea	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura symphyti	+	+	.	.	.	.	+	.	+	.	+	.	+	6
Dasineura tetensi	.	+	.	+	+	+	+	+	.	.	+	.	+	8
Dasineura tetrahit	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura teucrii	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura thomasi	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura thomasiana	+	+	.	+	+	+	+	.	+	.	+	+	+	10
Dasineura tiliae	+	+	.	+	+	+	+	.	+	+	+	+	+	11
Dasineura tortilis	+	+	+	+	.	+	+	+	+	+	+	+	+	12
Dasineura tortrix	+	+	+	.	.	+	+	.	+	.	+	+	+	9
Dasineura traili	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Dasineura trifolii	+	+	+	+	+	+	+	.	+	.	+	+	+	11
Dasineura tubicoloides	.	+	+	.	+	+	+	.	+	.	.	.	.	6
Dasineura tubularis	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Dasineura tympani	+	.	.	.	.	.	+	.	.	.	+	+	+	5
Dasineura ulmaria	+	+	.	+	+	+	+	+	+	+	+	+	+	12
Dasineura ulmicola	.	.	.	.	.	.	+	.	.	.	.	.	+	2
Dasineura urticae	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Dasineura viciae	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Dasineura violae	+	+	.	.	.	+	+	.	+	.	+	+	+	8
Dasineura violahirtae	+	.	+	.	.	+	.	+	.	.	.	.	+	5
Dasineura virgaureae	+	+	.	.	.	+	.	.	+	.	.	+	+	6
Dasineura vitisidaea	+	.	.	.	.	.	+	.	.	.	.	.	+	3
Dasineura xylostei	+	.	.	.	.	.	.	.	.	.	.	.	+	2

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Dichodiplosis langeni	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Didactylomyia longimana	.	.	.	.	.	.	.	+	.	+	.	.	.	2
Didymomyia tiliacea	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Diodaulus linariae	+	.	.	+	.	+	+	.	+	.	+	.	.	6
Diodaulus traili	+	+	.	.	.	+	.	.	+	.	+	+	+	7
Drisina glutinosa	+	+	+	.	.	+	+	.	+	+	+	+	+	10
Dryomyia circinans	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Endopsylla agilis	.	.	.	.	.	.	.	.	+	+	.	.	.	2
Feltiella acarisuga	+	+	.	.	.	.	.	.	.	.	.	.	.	2
Geocrypta braueri	+	+	.	+	+	+	.	.	+	.	.	.	.	6
Geocrypta campanulae	+	+	+	.	+	+	.	+	.	.	.	+	+	8
Geocrypta galii	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Geocrypta heterophylli	+	.	.	.	.	.	.	.	+	.	.	.	+	3
Gephyraulus diplotaxis	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Gephyraulus raphanistri	+	+	.	+	.	+	+	.	+	.	+	+	+	9
Giraudiella inclusa	.	+	+	+	+	+	+	.	+	.	+	+	.	9
Hadrobremia longiventris	.	.	.	.	.	.	.	.	.	+	+	.	.	2
Haplodiplosis marginata	+	.	+	+	+	+	+	+	+	+	.	.	+	10
Harmandiola cavernosa	+	+	.	+	+	+	+	+	+	+	+	+	+	12
Harmandiola globuli	+	+	+	+	.	+	+	+	+	+	+	+	+	12
Harmandiola populi	+	+	.	+	.	+	+	.	+	.	+	+	+	9
Harmandiola pustulans	.	+	.	.	.	.	+	.	.	.	.	+	+	4
Harmandiola tremulae	+	+	+	+	+	+	+	.	+	+	+	+	+	12
Hartigiola annulipes	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Herbomyia robusta	.	.	.	+	.	.	.	.	.	.	.	.	.	1
Holobremia fallacicornis	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Hybolasioptera fasciata	.	+	.	+	.	+	.	+	+	.	.	+	+	7
Hygrodiplosis vaccinii	.	+	.	.	.	.	.	.	.	.	.	+	.	2
Hyperdiplosis bryanti	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Hyperdiplosis lobata	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Inulomyia subterranea	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Iteomyia capreae	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Iteomyia major	+	+	.	+	.	+	+	.	+	+	+	+	+	10
Jaapiella alpina	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Jaapiella bryoniae	+	+	+	+	.	+	+	.	+	.	.	.	.	7
Jaapiella buhri	+	.	.	.	.	+	.	.	.	.	.	.	.	2
Jaapiella catariae	.	+	.	.	.	.	.	.	.	.	+	.	.	2
Jaapiella cirsiicola	+	+	.	.	+	+	.	.	+	.	+	.	+	7
Jaapiella clethrophila	.	.	.	.	+	.	.	.	+	.	.	.	+	3
Jaapiella compositarum	+	+	.	.	.	.	+	.	+	.	.	.	.	4
Jaapiella crinita	.	+	.	.	.	.	+	.	.	.	.	.	.	2
Jaapiella dittrichi	+	+	.	.	.	.	.	.	.	.	.	.	+	3
Jaapiella floriperda	+	.	.	.	.	.	.	.	.	.	+	.	+	3
Jaapiella genistamtorquens	.	+	+	.	+	.	.	.	+	.	.	.	.	4
Jaapiella genisticola	+	+	+	+	+	+	+	+	+	.	+	+	+	12
Jaapiella hedickei	.	+	.	.	.	.	+	.	.	.	+	+	+	5
Jaapiella hypochoeridis	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Jaapiella inflatae	+	.	+	.	.	.	.	+	.	.	+	.	.	4
Jaapiella jaapiana	.	+	.	.	.	+	.	.	+	.	.	.	.	3

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Jaapiella knautiae	+	.	.	.	.	+	.	.	.	.	.	+	+	4
Jaapiella loticola	.	+	.	.	.	+	+	.	.	.	+	+	+	6
Jaapiella medicaginis	+	+	+	+	.	+	.	.	+	.	+	+	+	9
Jaapiella parvula	.	.	+	.	.	.	+	.	.	.	.	.	.	2
Jaapiella picridis	.	.	.	.	.	.	.	+	.	.	.	.	+	2
Jaapiella rubicundula	+	+	.	.	.	+	+	.	+	.	+	.	.	6
Jaapiella sarothamni	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Jaapiella scabiosae	+	.	.	.	.	+	+	+	.	.	.	.	+	5
Jaapiella schmidti	+	+	.	.	.	.	.	+	+	.	+	+	.	6
Jaapiella thalictri	+	+	.	.	.	+	.	.	+	.	.	.	.	4
Jaapiella vacciniorum	+	+	.	.	.	+	+	+	+	.	+	+	+	9
Jaapiella veronicae	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Jaapiella volvens	+	+	+	.	+	+	+	.	+	.	.	.	+	8
Janetia cerris	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Janetia nervicola	.	+	.	.	.	.	.	.	.	.	+	+	+	4
Janetia panteli	.	+	+	.	+	+	.	.	.	+	.	+	.	6
Janetiella fallax	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Janetiella lemeei	+	+	.	.	.	+	.	.	.	.	+	+	+	6
Janetiella thymi	+	.	.	+	.	+	.	.	+	.	+	+	+	7
Janetiella tuberculi	+	+	.	.	+	+	+	.	+	.	.	.	.	6
Kaltenbachiola strobi	+	.	.	+	.	.	+	+	.	.	.	.	+	5
Karshomyia caulicola	.	.	.	.	+	.	.	.	+	.	.	.	.	2
Karshomyia marikovskii	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Kiefferia pericarpiicola	+	+	+	+	+	+	+	.	+	+	+	+	+	12
Lasioptera artemisiae	.	+	.	.	.	.	.	.	.	.	.	+	.	2
Lasioptera arundinis	.	+	+	.	.	+	.	.	+	.	+	.	.	5
Lasioptera auricincta	.	.	.	+	.	.	+	.	.	.	.	.	.	2
Lasioptera berberina	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Lasioptera buhri	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Lasioptera calamagrostidis	.	+	+	.	.	+	.	.	.	.	.	+	+	5
Lasioptera carophila	+	+	+	+	.	+	+	+	+	+	+	+	+	12
Lasioptera cerasiphera	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Lasioptera eryngii	.	.	+	.	.	+	.	+	.	.	.	.	.	3
Lasioptera flexuosa	.	.	+	.	.	.	.	+	.	.	.	.	.	2
Lasioptera francoisi	.	.	.	+	.	.	.	.	.	.	+	.	+	3
Lasioptera hungarica	.	+	+	.	.	.	.	.	.	.	.	.	.	2
Lasioptera melampyri	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Lasioptera moliniae	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Lasioptera populnea	+	+	.	+	.	+	+	.	+	+	+	+	+	10
Lasioptera rubi	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Lasioptera ruebsaameni	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Lasioptera stelteri	.	.	.	+	.	.	.	.	.	.	.	.	.	1
Lasioptera thuringica	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Lasioptera tiliarum	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Lathyromyza florum	.	.	.	+	.	.	.	.	+	.	.	.	+	3
Lathyromyza schlechtendali	.	.	.	.	.	.	+	+	+	.	.	+	+	5
Lestodiplosis arcuata	.	.	.	+	.	.	+	.	.	.	.	.	.	2
Lestodiplosis callida	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Lestodiplosis casta	.	.	.	+	.	.	.	.	.	.	.	.	.	1

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Lestodiplosis centralis	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Lestodiplosis coli	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Lestodiplosis cryphali	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Lestodiplosis fascipennis	.	.	.	+	.	.	+	.	+	.	.	.	.	3
Lestodiplosis flaveolata	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Lestodiplosis holstei	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Lestodiplosis longifilis	.	.	.	.	.	.	.	.	.	+	.	.	.	1
Lestodiplosis maculata	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Lestodiplosis morchellae	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Lestodiplosis necans	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Lestodiplosis parricida	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Lestodiplosis plicatricis	.	.	.	.	+	.	.	.	.	.	.	.	.	1
Lestodiplosis polypori	.	.	.	+	.	.	.	+	.	.	.	.	+	3
Lestodiplosis pulchella	.	.	.	+	.	.	+	.	.	.	.	.	.	2
Lestodiplosis raphani	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Lestodiplosis tarsonemi	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Lestodiplosis tibialis	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Lestodiplosis trivittata	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Lestodiplosis variegata	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Lestodiplosis vasta	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Lestodiplosis vorax	.	+	.	+	.	.	+	.	.	.	.	.	.	3
Lestodiplosis xylodiplosuga	.	.	+	.	.	.	.	.	.	.	.	.	.	1
Loewiola centaureae	+	.	+	+	.	+	+	+	+	+	+	+	+	11
Macrodiplosis pustularis	+	+	+	+	+	+	+	.	+	+	+	+	+	12
Macrodiplosis roboris	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Macrolabis achilleae	.	+	.	.	.	+	.	.	+	.	.	.	+	4
Macrolabis alnicola	.	+	.	.	.	.	.	+	+	.	.	.	.	3
Macrolabis aquilegiae	.	.	.	.	.	.	.	.	.	.	+	.	.	1
Macrolabis bedeguariformis	.	+	.	.	.	+	.	.	.	.	.	.	.	2
Macrolabis brunellae	+	.	+	.	.	+	.	.	.	.	.	+	+	5
Macrolabis buhri	.	.	.	.	.	+	.	.	.	.	.	+	.	2
Macrolabis cirsii	.	+	.	.	.	.	+	.	.	.	.	.	.	2
Macrolabis dulcamarae	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Macrolabis fagicola	+	.	.	+	.	+	.	.	+	.	.	.	+	5
Macrolabis floricola	.	+	.	.	.	+	.	.	.	.	.	.	.	2
Macrolabis heraclei	+	+	+	+	+	+	+	.	+	.	+	+	+	11
Macrolabis hieracii	+	+	.	+	.	+	.	.	+	.	+	+	+	8
Macrolabis hippocrepidis	+	.	.	.	.	.	.	+	.	.	.	.	+	3
Macrolabis holosteae	+	+	.	.	.	+	.	.	+	.	+	+	.	6
Macrolabis incognita	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Macrolabis incolens	.	+	.	.	.	.	+	.	+	.	.	.	.	3
Macrolabis jaapi	.	+	.	.	.	+	.	.	+	.	.	.	+	4
Macrolabis lamii	+	+	+	.	.	+	+	.	+	.	+	.	+	8
Macrolabis laserpitii	+	.	.	.	.	.	.	.	.	.	.	.	+	2
Macrolabis lonicerae	+	.	.	.	.	+	.	+	+	.	.	.	.	4
Macrolabis luceti	+	+	.	.	.	.	.	.	.	.	.	+	.	3
Macrolabis lutea	.	+	.	.	.	.	.	+	+	.	.	.	.	3
Macrolabis mali	.	.	+	.	.	.	.	.	.	.	.	.	.	1
Macrolabis orobi	+	.	.	.	.	.	.	.	.	.	.	.	+	2

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Macrolabis pavida	.	.	.	.	.	+	.	+	+	.	+	.	.	4
Macrolabis pilosellae	+	+	.	+	.	+	+	+	+	.	.	+	+	9
Macrolabis podagrariae	+	+	.	.	.	+	.	.	.	.	+	+	+	6
Macrolabis pratorum	+	.	.	.	.	.	.	+	.	.	.	.	.	2
Macrolabis quercicola	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Macrolabis saliceti	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Macrolabis stellariae	+	+	.	.	.	+	.	.	.	.	+	.	+	5
Macrolabis vicicolus	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Mamaevia vysineki	.	.	.	.	+	.	.	.	+	.	.	.	.	2
Massalongia bachmaieri	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Massalongia rubra	+	+	.	+	.	+	+	+	+	.	+	+	.	9
Mayetiola agrostidis	.	.	.	+	.	.	.	.	.	.	.	.	.	1
Mayetiola agrostivora	.	.	.	.	+	.	.	.	+	.	.	.	.	2
Mayetiola alopecuri	.	.	+	.	.	.	.	.	.	.	.	+	.	2
Mayetiola bifida	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Mayetiola bimaculata	.	+	.	.	.	.	.	.	.	.	.	+	.	2
Mayetiola buhri	.	.	.	.	.	+	.	.	.	.	.	.	+	2
Mayetiola culacera	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Mayetiola dactylidis	.	.	.	+	.	.	.	.	.	.	.	+	.	2
Mayetiola destructor	+	+	+	+	+	+	+	.	+	.	.	.	+	9
Mayetiola graminis	+	.	+	+	+	+	+	+	+	+	+	+	+	12
Mayetiola hellwigi	.	.	+	.	.	+	.	+	.	.	.	+	+	5
Mayetiola holci	.	.	.	+	.	.	.	.	.	.	.	+	.	2
Mayetiola hordei	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Mayetiola joannisi	+	.	.	+	.	.	.	.	.	.	.	+	+	4
Mayetiola lanceolatae	+	+	.	.	.	.	.	.	.	.	+	+	.	4
Mayetiola moliniae	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Mayetiola phalaris	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Mayetiola puccinelliae	.	.	.	.	+	.	.	.	+	.	.	.	.	2
Mayetiola radicifica	.	+	.	.	.	.	.	.	+	.	.	+	.	3
Mayetiola schoberi	.	.	.	.	.	+	.	.	+	.	.	.	.	2
Mayetiola ventricola	+	+	.	+	+	.	.	.	+	.	.	.	.	5
Mikiola fagi	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Mikomya coryli	.	+	.	.	.	.	.	.	.	.	+	+	.	3
Monarthropalpus flavus	.	+	.	+	.	+	+	+	+	.	+	.	.	7
Monobremia subterranea	.	.	.	+	.	.	.	.	+	.	.	.	.	2
Monodiplosis liebeli	+	.	+	.	.	.	+	.	.	.	.	.	.	3
Mycocecis ovalis	.	.	.	+	.	.	.	.	.	.	.	.	.	1
Mycodiplosis buhri	.	.	.	.	.	.	.	.	.	.	+	.	+	2
Mycodiplosis ceomatis	.	+	.	.	.	.	+	.	.	.	.	.	.	2
Mycodiplosis coniophaga	+	+	+	+	+	.	+	+	.	.	+	+	+	10
Mycodiplosis erysiphes	.	+	+	+	.	.	+	.	.	.	.	.	+	5
Mycodiplosis gloeopenio-phorae	.	+	.	+	.	.	.	.	.	.	.	.	.	2
Mycodiplosis heterosaetosa	.	+	+	.	.	.	.	.	.	.	+	.	+	4
Mycodiplosis isosaetosa	.	.	+	+	.	.	.	.	.	.	.	.	+	3
Mycodiplosis limbata	.	.	.	.	.	+	+	.	.	.	.	.	.	2
Mycodiplosis melampsorae	+	+	+	+	.	.	+	.	.	.	+	+	+	8
Mycodiplosis oidii	.	.	+	+	.	.	.	.	.	.	.	.	+	3

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Mycodiplosis plasmoparae	.	.	.	+	.	.	.	+	.	+	.	.	+	4
Mycodiplosis pucciniae	.	+	+	+	.	.	+	.	.	.	.	.	+	5
Mycodiplosis saundersi	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Mycodiplosis sphaerothecae	.	+	+	+	.	.	+	.	.	.	+	+	+	7
Mycodiplosis tussilaginis	.	.	.	.	.	.	.	.	.	.	+	.	.	1
Neoisodiplosis corticii	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Neoisodiplosis longisaetosa	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Neomikiella beckiana	+	.	.	+	.	.	+	.	.	.	+	.	+	5
Neomikiella lychnidis	+	+	+	+	.	+	.	.	+	.	+	+	.	8
Neomycodiplosis ruebsaameni	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Obolodiplosis robiniae	+	+	+	+	+	.	+	+	.	+	.	+	+	10
Octodiplosis glyceriae	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Oligotrophus gemmarum	.	+	.	.	.	+	+	.	.	.	.	.	.	3
Oligotrophus juniperinus	+	+	.	+	.	+	+	.	.	.	.	+	+	7
Oligotrophus panteli	+	+	.	+	+	+	+	.	.	.	.	.	.	6
Oligotrophus schmidti	+	+	.	.	.	.	.	.	+	.	.	.	+	4
Ozirhincus anthemidis	.	+	+	+	.	.	.	.	.	.	+	.	.	4
Ozirhincus longicollis	+	+	+	+	.	.	+	+	+	.	.	.	.	7
Ozirhincus millefolii	+	+	+	+	.	.	+	.	+	.	.	+	.	7
Ozirhincus tanaceti	+	.	.	+	.	.	+	.	+	.	+	+	.	6
Paradiplosis abietispectinatae	+	.	+	.	.	.	.	.	.	.	.	.	.	2
Parallelodiplosis bupleuri	.	.	.	.	.	.	.	+	.	.	+	.	+	3
Parallelodiplosis galliperda	.	+	+	+	.	.	.	.	+	.	.	.	+	5
Phegomyia fagicola	+	+	.	+	.	+	+	.	+	+	+	.	+	9
Physemocecis hartigi	+	+	.	.	.	+	+	.	+	.	+	+	+	8
Physemocecis ulmi	+	+	.	.	.	+	.	.	+	.	+	+	+	7
Placochela ligustri	+	+	.	+	.	.	.	+	+	.	+	+	+	8
Placochela nigripes	+	+	.	+	+	+	+	+	+	.	+	+	+	11
Planetella arenariae	.	+	.	.	.	.	.	.	+	.	.	.	.	2
Planetella caricis	.	+	.	.	.	+	.	.	+	.	.	.	.	3
Planetella cornifex	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Planetella cucullata	.	.	+	.	.	.	+	.	.	.	.	.	.	2
Planetella fischeri	.	.	.	.	+	+	.	.	.	.	.	.	.	2
Planetella gallarum	+	+	.	.	.	+	.	.	+	.	.	.	.	4
Planetella grandis	.	+	.	.	+	.	.	.	.	.	.	.	.	2
Planetella granifex	.	+	.	.	.	.	+	.	.	.	.	.	.	2
Planetella producta	.	.	+	.	.	.	.	.	.	.	.	.	.	1
Planetella rosenhaueri	.	+	.	.	.	.	.	+	.	.	.	.	.	2
Planetella tarda	.	+	.	.	.	.	.	.	+	.	.	.	.	2
Planetella tuberifica	.	+	+	.	.	.	+	+	.	.	.	.	.	4
Planetella tumorifica	.	+	.	+	.	.	.	.	.	.	.	.	.	2
Planetella westermanni	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Planetella winnertzi	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Plemeliella abietina	+	.	.	+	.	.	.	.	+	.	.	+	.	4
Polystepha malpighii	.	+	.	.	.	.	.	.	.	.	.	.	+	2
Procystiphora gerardi	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Prodiplosis rhenana	.	.	.	.	.	.	.	+	.	.	.	.	.	1

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Prolauthia circumdata	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Putoniella pruni	+	+	.	+	.	+	+	.	+	+	+	+	+	10
Rabdophaga albipennis	+	+	.	+	+	+	+	.	+	.	.	.	+	8
Rabdophaga clavifex	+	+	+	.	.	+	+	+	.	.	+	+	+	9
Rabdophaga degeerii	+	+	.	+	.	+	+	+	+	.	.	.	+	8
Rabdophaga deletrix	+	+	.	.	.	.	.	.	.	.	.	.	.	2
Rabdophaga dubiosa	+	+	+	+	+	+	.	.	+	.	.	+	+	9
Rabdophaga exsiccans	.	+	.	.	.	+	.	.	.	.	.	.	.	2
Rabdophaga gemmicola	.	+	.	.	.	+	.	.	+	.	.	+	.	4
Rabdophaga giraudiana	.	.	.	.	.	.	.	.	+	.	.	.	+	2
Rabdophaga heterobia	+	+	.	+	.	+	+	+	+	.	+	+	+	10
Rabdophaga insignis	.	+	.	.	.	.	.	.	.	.	.	.	+	2
Rabdophaga iteobia	+	+	+	+	.	+	+	.	+	.	.	+	+	9
Rabdophaga jaapi	+	+	.	.	.	+	.	.	+	.	+	+	.	6
Rabdophaga justini	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Rabdophaga karschi	+	+	.	.	.	+	.	.	+	+	.	.	.	5
Rabdophaga lattkei	.	.	.	.	.	+	.	.	+	.	.	.	.	2
Rabdophaga lindhardti	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Rabdophaga marginem-torquens	+	+	.	+	.	+	+	.	+	+	+	+	+	10
Rabdophaga nervorum	+	+	+	+	.	+	+	.	+	.	+	.	.	8
Rabdophaga nielseni	.	+	.	.	.	.	.	.	+	.	.	.	.	2
Rabdophaga paliumparens	.	.	.	.	.	+	.	.	.	.	.	+	+	3
Rabdophaga pierreana	+	.	.	.	.	.	.	.	.	.	.	+	.	2
Rabdophaga pierrei	.	+	.	+	+	+	.	.	+	.	.	.	.	5
Rabdophaga pseudococcus	.	+	.	+	.	.	.	.	.	+	.	.	+	4
Rabdophaga pulvini	+	+	+	.	+	+	.	.	+	.	.	+	+	8
Rabdophaga repenticola	.	+	.	.	+	+	.	.	+	.	.	.	.	4
Rabdophaga repentiperda	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Rabdophaga rosaria	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Rabdophaga rosariella	.	+	.	.	+	.	.	.	+	.	.	+	.	4
Rabdophaga roskami	.	+	.	.	+	+	.	.	.	.	.	.	.	3
Rabdophaga saliciperda	.	+	+	+	.	+	+	.	+	.	+	+	+	9
Rabdophaga salicis	+	+	+	+	.	+	+	+	+	+	+	+	+	12
Rabdophaga schicki	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Rabdophaga schreiteri	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Rabdophaga schwangarti	.	.	.	.	.	.	.	+	.	.	.	+	.	2
Rabdophaga strobilina	+	+	.	.	.	.	.	.	.	.	.	.	.	2
Rabdophaga terminalis	+	+	.	.	+	+	+	.	+	+	+	+	+	10
Rabdophaga triandraperda	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Rabdophaga vigemmae	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Rabdophaga viminalis	+	+	.	.	.	+	.	.	.	.	.	.	.	3
Resseliella betulicola	+	+	.	.	.	+	+	.	+	.	+	+	+	8
Resseliella crassa	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Resseliella crataegi	.	.	.	+	.	.	+	.	.	.	.	.	.	2
Resseliella oculiperda	.	+	.	+	.	.	+	+	.	.	.	.	.	4
Resseliella piceae	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Resseliella quercivora	.	.	+	.	.	.	.	.	.	.	.	.	.	1
Resseliella theobaldi	.	+	.	.	+	.	.	.	.	.	+	.	.	3

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Rhizomyia circumspinosa	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Rhizomyia fasciata	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Rhopalomyia artemisiae	+	+	+	.	+	+	+	+	+	.	+	+	+	11
Rhopalomyia baccarum	+	+	.	+	.	+	+	.	+	.	.	.	.	6
Rhopalomyia campestris	.	+	.	+	.	.	.	+	+	.	.	.	.	4
Rhopalomyia chrysanthemi	+	+	.	.	.	.	.	.	+	.	.	.	.	3
Rhopalomyia cristaegalli	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Rhopalomyia florum	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Rhopalomyia foliorum	+	.	.	.	+	+	+	+	+	.	+	.	.	7
Rhopalomyia hypogaea	+	.	.	.	.	+	.	.	+	.	.	.	+	4
Rhopalomyia magnusi	.	+	.	.	.	.	.	.	+	.	.	.	.	2
Rhopalomyia millefolii	+	+	.	+	.	+	+	+	+	+	+	+	+	11
Rhopalomyia palearum	.	.	.	.	.	.	+	.	+	.	.	+	.	3
Rhopalomyia ptarmicae	+	+	.	+	+	+	+	+	+	+	+	+	.	11
Rhopalomyia syngenesiae	+	.	.	.	.	.	+	.	.	.	+	.	.	3
Rhopalomyia tanaceticola	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Rhopalomyia tubifex	+	+	.	.	+	+	+	.	.	.	.	.	.	5
Rondaniola bursaria	+	+	.	+	+	+	+	+	+	+	+	+	.	11
Sackenomyia reaumurii	+	.	.	+	.	.	+	+	.	+	+	+	+	8
Schizomyia galiorum	+	+	+	+	+	+	+	+	+	.	+	+	+	12
Semudobia betulae	+	+	.	+	+	+	+	+	+	.	+	+	+	11
Semudobia skuhravae	.	+	.	.	.	.	.	.	.	.	+	.	.	2
Semudobia tarda	.	+	.	.	.	.	+	.	.	.	.	.	.	2
Silvestriola minima	.	.	.	.	.	.	+	.	.	.	.	.	.	1
Sitodiplosis cambriensis	+	.	.	.	.	+	.	.	+	.	.	.	+	4
Sitodiplosis mosellana	+	.	+	+	+	+	+	.	+	+	+	+	+	11
Spurgia esulae	.	.	.	+	.	.	.	.	.	.	.	.	.	1
Spurgia euphorbiae	+	+	+	+	.	+	+	+	+	+	+	+	+	12
Stenodiplosis bromicola	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Stenodiplosis geniculati	.	.	+	+	+	.	.	.	+	.	.	.	.	4
Sterrhaulus corneolus	.	+	.	+	.	.	.	.	.	.	.	.	.	2
Stomatosema kamali	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Taxomyia taxi	+	.	+	+	+	+	+	.	+	.	.	.	+	8
Thecodiplosis brachyntera	+	+	.	+	+	+	.	.	+	.	+	+	.	8
Thurauia aquatica	.	+	.	+	.	.	.	.	+	.	.	.	.	3
Thurauia uliginosa	.	+	.	.	.	.	.	.	.	.	.	.	.	1
Tricholaba similis	.	+	+	+	.	.	.	.	+	.	.	.	.	4
Tricholaba trifolii	+	+	.	+	.	+	+	+	+	.	.	+	+	9
Tricholaba viciarum	.	.	.	.	.	+	.	.	.	.	.	.	+	2
Tricholaba viciobia	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Trisopsis abdominalis	.	.	.	.	.	+	.	.	.	.	+	.	.	2
Trisopsis globularis	.	.	.	.	.	.	.	.	.	+	.	.	.	1
Trisopsis punctiventris	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Trotteria galii	+	+	.	+	.	.	+	+	+	.	.	.	+	7
Trotteria obtusa	+	.	.	+	+	.	.	+	.	.	.	.	+	5
Trotteria umbelliferarum	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Vitisiella oenephila	.	.	.	.	.	.	.	+	.	.	.	.	.	1
Wachtliella caricis	+	+	.	+	.	+	+	+	+	.	.	.	.	7
Wachtliella ericina	+	.	.	.	.	+	.	.	+	.	+	.	.	4

Gall midge species	BA	BB	BW	HE	LS	MP	NW	RP	SH	SL	ST	SY	TH	NS
Wachtliella krumbholzi	.	.	.	.	.	+	.	.	.	.	.	.	.	1
Wachtliella niebleri	+	.	.	.	.	.	.	.	.	.	.	.	.	1
Wachtliella persicariae	+	+	.	+	+	+	+	+	+	.	+	+	.	10
Wachtliella stachydis	+	+	+	+	.	+	+	+	+	.	+	+	+	11
Xenodiplosis laeviusculi	.	+	.	.	.	.	.	+	.	.	.	.	.	2
Xylodiplosis nigritarsis	.	.	+	.	.	.	+	.	+	.	.	.	.	3
Zeuxidiplosis giardi	.	+	.	.	.	.	+	.	.	.	+	.	.	3
Zygiobia carpini	+	+	+	+	+	+	+	+	+	+	+	+	+	13
Zygiobia ruebsaameni	.	.	.	.	.	+	.	.	.	.	.	.	.	1

Mecklenburg-Western Pomerania (MP)

HEDICKE (1917a) recorded galls of several species in Pomerania, BUHR (1929, 1930, 1939) 161 species, SCHLEICHER in KRÖBER (1935) 156 species and STELTER (from 1954 to 1994) many species mainly in the surroundings of Groß Lüsewitz. HAASE & UTECH (1971) recorded galls of 82 species in the natural reserve "Ostufer der Müritz" and KRUSE (2009) 17 species in Ludwigslust. In total, 286 gall midge species are recorded for this state and density is 129 species per 1000 km².

North Rhine-Westphalia (NW)

WINNERTZ (1853) recorded galls of many species in Krefeld and its surroundings, RÜBSAAMEN (1889a, 1890a, 1891d) many species near Siegen and its surroundings, NIESSEN (1928, 1937, 1938) and LUDWIG (1935) many species in Bonn and Siegen and their surroundings and DREWECK (1980) 33 species in Lüdenscheid. In total, 251 gall midge species are recorded for this state and density is 104 species per 1000 km².

Rhineland-Palatinate (RP)

RÜBSAAMEN (1889a) recorded galls of 151 species in Rhineland, GEISENHEYNER (1902, 1913) several gall midges at Bad Kreuznach and its surroundings and NIESSEN (1928, 1937, 1938) galls of 52 species in Rhineland. LUDWIG (1935) recorded Rübsaamen´s findings of gall midge galls in Rhineland. SKUHRAVÁ in WEBER (1995) idenfitied 11 species of gall midges collected in various caves. STAUDT (2013) recorded galls of 24 species during investigations in 2011-2012. In total, 157 gall midge species are recorded for this state and density is 75 species per 1000 km².

Saarland (SL)

STAUDT (2013) recorded galls of 65 species during biodiversity studies in the "Saar-Lor-Lux" project (Saarland, Lorraine, and Luxembourg). In total, 83 gall midge species are recorded for this state and density is 69 species per 1000 km².

Saxony (SY)

HIERONYMUS (1890) recorded galls of 7 species, BERGER (1936) 27 species in Kamenz and its surroundings and BUHR (1966) 167 species and KWAST (unpublished, 2012) 28 species, both at various localities in Saxony. In total, 225 gall midge species are recorded for this state and density is 107 species per 1000 km².

Saxony-Anhalt (ST)

HIERONYMUS (1890) recorded galls of several species, V. SCHLECHTENDAL (1883) galls of 11 species near Halle, LANGE (1936) 119 species in Naumburg and its surroundings, RAPP (1942) reviewed 83 species from Naumburg recorded by previous researchers, KÜHLHORN (1957) 15 species at Mansfeld, UTECH (1988a, 1988b) 27 species in various nature

reserves situated near the River Saale, SKUHRAVÁ & SKUHRAVÝ (1988) 90 species around Allrode in the Harz mountains and KWAST (2012, unpublished) 8 species. In total, 206 gall midge species are recorded for this state and density is 98 species per 1000 km².

Schleswig-Holstein & Hamburg (SH)

BEUTHIN (1887) recorded galls of 12 species in the surroundings of Hamburg, KRÖBER (1910, 1949) 72 species in Hamburg and Schleswig-Holstein, JAAP (1928) 96 species near Lauenburg (Holstein), BENICK (1932) 21 species (identification p.p. controlled by Hedicke, Berlin) at Dummersdorf (near the river Trave), SCHLEICHER in KRÖBER (1935) and KRÖBER (1956) 215 species, MEYER (1984, 1985) 44 species in Schleswig-Holstein, SEGEBADE & SCHAEFER (1979) 4 species in Kiel and its surroundings, PICHINOT & MEYER (1998) 269 species collected between 1970-1998 in Schleswig-Holstein. In total, 297 gall midge species are recorded for this state and density is 148 species per 1000 km².

Thuringia (TH)

HIERONYMUS (1890) recorded galls of 10 species and JAAP (1924-1925) 156 species. RAPP (1942) reviewed 158 species recorded by previous researchers. BUHR (1960) recorded galls of 19 species, LUDWIG (1974) 7 species in Nordhausen, OSCHMANN (2000) 139 species in western Thuringia and KWAST (unpublished, 2012) 7 species. In total, 266 gall midge species are recorded for this state and density is 133 species per 1000 km².

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