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Gall midges (Diptera: Cecidomyiidae) of Algeria

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Abstract. The known fauna of gall midges in Algeria is composed of 109 valid species belonging to 43 genera, and four undescribed species. It is the richest fauna of five countries spread along the Mediterranean Sea in North Africa. Twenty five species of gall midges were decribed on the basis of material collected in Algeria and have there their type localities. The two most abundant species of gall midges in Algeria are *Asphondylia punica* Marchal, 1897, causing galls on *Atriplex halimus*, and *Rhopalomyia navasi* Tavares, 1904, inducing galls on *Artemisia herba-alba*. Galls of *R. navasi* were recorded at two localities in northwestern Algeria recently, in the year 2015. The most species rich genus is *Dasineura* Rondani, 1840, with twenty five species, followed by *Asphondylia* Loew, 1850 (ten species), *Contarinia* Rondani, 1860 (eight species), and *Stefaniola* Kieffer, 1913 (seven species). On the basis of larval feeding habits most species are phytophagous, ten species are mycophagous and *Aphidoletes aphidimyza* (Rondani, 1847) and *Arthrocnodax clematitis* Marchal, 1897 are zoophagous. Phytophagous species are associated with 83 host plant species belonging to 65 genera of 29 plant families. Chenopodiceae is the plant family hosting the highest number of gall midges – sixteen species of gall midges. Three quarter of host plant species are herbaceous plants and one quarter trees or shrubs. Usually only one species of gall midge is associated with one host plant species. Four host plants – *Atriplex halimus*, *Fraxinus excelsior*, *Phillyrea latifolia*, and *Salsola vermiculata* – are associated with three species of gall midges. *Erica arborea* is the host plant with the highest number of gall midges: it hosts *Dasineura ericaescopariae* (Dufour, 1837), *D. grasseti* Barnes, 1935, *Myricomyia mediterranea* (Löw, 1885), and *Wachtliella ericina* (Löw, 1885). Zoogeographical analysis: 62 species (57%) are Mediterranean, 33 species (30%) European, ten species (8%) Eurosiberian; *Micromya lucorum* Rondani, 1840, *Cedrocrypta montana* Kieffer, 1919 and *Aphidoletes aphidimyza* (Rondani, 1847) are Holarctic species; *Mayetiola destructor* (Say, 1817) is Palaearctic species. Economic importance: no significant pests in agriculture and forestry were recorded. *Mayetiola destructor*, *M. hordei* Kieffer, 1909, and *M. avenae* (Marchal, 1895) are potential pests of cereals.

Key words. Faunistics, zoogeography, biogeography, species richness, distribution, plant-animal interactions, economic importance, Diptera, Cecidomyiidae, Algeria, North Africa, Mediterranean, Palaearctic Region.

INTRODUCTION

Several European researchers took part in investigations of galls on plants occurring in Algeria. Most investigations have been done shortly before the end of the nineteenth century and at the beginning of the twentieth century. Decaux (1895) was the first who discovered galls caused by gall midges on *Tamarix articulata* in Algeria. Marchal (1896, 1897) took an excursion to northern Algeria, found several interesting galls and described two new species of gall midges found in Algeria. Houard contributed importantly to the knowledge of gall midge fauna of Algeria. He undertook several scientific journey to North Africa and published results in series of contributions (Houard 1901a, b, c, 1902, 1912a, b, c, d, e, 1913c, 1917). He summarized knowledge of

galls gathered by him and by other researchers in an extensive publication *Zoocécidies du Nord de l'Afrique* (Houard 1912e) which is equipped with many figures of galls on plants helping to identificate galls.

Jean-Jacques Kieffer summarized knowledge on gall midges found in Europe and Algeria in three books (Kieffer 1898, 1900, 1901). He described several new species and new genera of gall midges from Algeria on the basis of materials sent him for identification by various collectors. Mathilde Schneider-Orelli undertook a scietific journey in 1910 with the aim to collect galls in Algeria. She found galls caused by 25 arthropods on various host plants of which five galls were caused by gall midges (Schneider-Orelli 1912). Bequaert (1914) collected galls during excursions in 1910 and 1913 in northern part of Algeria where he found 54 galls caused by various insects and eriophyid mites on 45 host plants. Seventeen galls were caused by gall midges.

Möhn (1969, 1971) described eight new species of gall midges from Algeria based on larvae which he obtained from dry galls preserved in collections of plant galls deposited in various museums. In the years 1974 and 1975 Neacsu and Chapot undertook excursions in northern Algeria. They found galls caused by 22 arthropod species of which nine species were gall midges (Neascu & Chapot 1979). Skuhravá (1986) as the first summarized scattered data on the occurrence of gall midges and their galls in Algeria in the *Catalogue of Palaearctic Diptera*. She gave a total of 74 species of gall midges found in Algeria. Since that time only few other gall midges have been discovered in Algeria. In the meantime it succeeded to obtain some other papers and to identify several causers of galls which were not identitied to the species level in the past.

In this paper we summarize scattered pieces of knowledge on gall midges of Algeria published in various scientific journals and give more information on each species, evaluate the fauna of gall midges from the zoogeographical point of view and compare fauna of Algeria with faunas of gall midges known in other countries of North Africa. We hope that our paper will attract the attention of entomologists to this intresting group of insects inducing galls on plants.

STUDY AREA

Algeria, officially the People's Democratic Republic of Algeria**,** is a country in North Africa on the Mediterranean coast. It is the largest country in Africa occupying an area of 2,381,741 km^2. It is bordered to the northeast by Tunisia, to the east by Libya, to the west by Morocco, to the southwest by the Western Saharan territory, Mauritania and Mali, to the southeast by Niger and to the north by the Mediterranean Sea. Sahara is spread in southern part of Algeria. The highest point is Mount Tahat, 3,003 m a. s. l. in Hoggar Mountains in an arid, rocky high plateau area of the central Sahara Desert in southern part of Algeria. Algeria has varied vegetation including coastal, mountainous and grassy desert-like regions.

MATERIAL AND METHODS

We gathered data on gall midges occurring in Algeria from articles of various researchers, published over a period of more than a hundred years, from the end of the 19th century until the present. Most of the species of gall midges recorded in Algeria were found by collecting galls from different host plants. Some species of gall midges are known only on the basis of the description of galls, others on the basis of larvae and a few on the basis of adults. It will be needful to find galls of such species which are based on galls or larvae and try to rear adults. It is the best way to verify the identity of the causers and inhabitants of the galls. Identification of galls is based on keys of Houard (1908–1909, 1913a, 1922–1923). The nomenclature of gall midge species is based on Gagné & Jaschhof (2017), the nomenclature of host plant species on Tutin et al. (1964–1980) and *The Plant List* (Anonymous 2013). The economic importance of gall midge species was assessed based on information in Barnes (1946–1956), Nijveldt (1969), Darvas et al. (2000) and Skuhravá & Roques (2000), zoogeography on Skuhravá & Skuhravý (2010).

Distribution is based on data of occurrence of gall midges in the Palaearctic region (Skuhravá 1986), in the world (Gagné & Jaschhof 2017), on analysis of areas of distribution (Skuhravá 1980, 1987, Skuhravá et al. 1984) and on results of investigations of M. Skuhravá and V. Skuhravý carried out in the years 1955–2013 at 1898 localities situated in twenty three countries of Europe and twelve islands in the Mediterranean Sea which were published in series of articles cited in Skuhravá & Skuhravý (2010); further on data given in Jaschhof (1998), Fedotova (2000), Mirumian (2011), Skuhravá (2016), Skuhravá & Skuhravý (2016a, b), and Skuhravá et al. (2013, 2014a, b, c, 2017a, b).

RESULTS

The fauna of gall midges in Algeria is composed of 109 valid species belonging to 43 genera, and four undescribed species. Twenty five species of gall midges were decribed on the basis of material collected in Algeria and have their type localities in Algeria. In the following part we present an annotated list of gall midge species recorded in Algeria and a list of host plant species with associated gall midge species. At the end we evaluate all data obtained in Algeria from the zoogeographical and economical points of view.

Annotated list

The following data are given for each species: species name, author and date of description, short description of the biology, description of the gall, host plant species and plant family, type locality, occurrence in Algeria with names of localities where galls were found, type of distribution and references to publications of researchers.

Subfamily Lestremiinae

Micromya lucorum Rondani, 1840

Adults fly in forests, on meadows, pastures and fields. Larvae are mycophagous or sapromycophagous (Jaschhof 1998).
Occurrence. Oasis of Biskra (Kieffer 1924).
Distribution. Holarctic.

Monardia brachyptera (Kieffer, 1913)

A single female was obtained from a mushroom.
Occurrence. Alger (type locality). This species has not been found since that time (Kieffer 1913).
Distribution. Mediterranean.

Subfamily Porricondylinae

Asynapta ilicis (Kieffer, 1919)

Adults were caught in forest.
Occurrence. Djurdjura, the forest of Dra-Inguel, Haizer (type locality). This species has not been found since that time (Kieffer 1919).
Distribution. Mediterranean (Algeria).

Camptomyia alnicola Kieffer, 1919

Adults were reared from wood of withered *Alnus glutinosa* (L.) Gaertn. (Betulaceae).
Occurrence. Kabylia: Yakouren (type locality). This species has not been found since that time (Kieffer 1919).
Distribution. Mediterranean (Algeria).

Cedrocrypta montana Kieffer, 1919

Adults were reared from wood of withered trunk of *Cedrus atlantica* (Endl.) Man. (Pinaceae).
Occurrence. Djurdjura (Gagné & Jaschhof 2017), Crète du Haïzer (type locality; Kieffer 1919).
Distribution. Holarctic. This species was found in USA (Pennsylvania), Sweden, Latvia, Germany, and Algeria.

Porricondyla peyerimhoffi (Kieffer, 1919)

A male has been reared from forest soil.
Occurrence. Bouira-Sahary, near Ain Oussera and Djelfa (type locality). This species has not been found since that time. Jaschhof & Jaschhof (2013: 208) consider *P. peyerimhoffi* as nomen dubium (Kieffer 1919).
Distribution. Mediterranean (Algeria).

Rhipidoxylomyia excavata Mamaev, 1964

Adults were caught in nature.
Occurrence. Ain Uru, leg. Kneminski (Jaschhof & Jaschhof 2013, Gagné & Jaschhof 2017, Spungis 1992).
Distribution. European (Sweden, Russia), Algeria.

Subfamily Cecidomyiinae

Acodiplosis pulicariae Kieffer, 1913

Larvae cause galls on leaves of *Pulicaria odora* Rchb. (Asteraceae).
Occurrence. Bouzarea in Sahel (type locality); environs of Alger; Sahel, Bouzarea, leg. R. Maire (as Cécidomyide); Sahel, Bouzarea (Houard 1912b, c, e, 1913c).
Distribution. Mediterranean (Algeria, Portugal).

Aphidoletes aphidimyza (Rondani, 1847)

Larvae feed predaciously on many species of aphids (Hemiptera: Aphididae) on various host plants.
Occurrence. Algeria, without the name of the locality (Labdaoui & Guenaoui 2015).
Distribution. Holarctic.

Aplonyx chenopodii De Stefani, 1908

Larvae develop in plurilocular swellings on stems of *Atriplex patula* (L.) (Chenopodiaceae).
Occurrence. Koléa, plaine de Mazfran (Houard 1923).
Distribution. Mediterranean (Italy, Algeria).

Arthrocnodax clematitis Marchal, 1897

Zoophagous species. Marchal (1897) described male and female that were reared from galls of *Phyllocoptes populi* Nalepa, 1891) (Acarina: Eriophyidae) on *Clematis cirrhosa* L. (Ranunculaceae).
Occurrence. Blidah, Vallon des Singes (type locality; Marchal 1897).
Distribution. Mediterranean.

Asphondylia calycotomae Kieffer, 1912

A solitary larva develops in swollen leaf bud (hibernating generation) and in deformed pod (summer generation) of *Calycotome spinosa* L. (Fabaceae).
Occurrence. Saint-Denis-du-Sig (type locality), Alger (Bequaert 1914, Houard 1901, 1912e, 1921).
Distribution. Mediterranean.

Asphondylia capparis Rübsaamen, 1893

Larvae develop in swollen flower buds of *Capparis spinosa* L. (Capparidaceae).
Occurrence. Mascara (Houard 1921).
Distribution. Mediterranean.

Asphondylia coronillae (Vallot, 1829)

Larvae develop in swollen buds or deformed pods of various species of *Coronilla emerus* L., *C. juncea* L. and other species of the genus *Coronilla* (Fabaceae).
Occurrence. Alger (as Cécidomyide; Houard 1923).
Distribution. Mediterranean.

Asphondylia cytisi Frauenfeld, 1873

Larvae produce galls on buds of species of the genus *Cytisus austriacus* L., *Cytisus triflorus* Lam. and other species of the genus *Cytisus* (Fabaceae).
Occurrence. Alger (Bequaert 1914).
Distribution. European, spred up to Western Siberia and Algeria.

Asphondylia pilosa Kieffer, 1898

Larvae cause slender and pointed, densely haired galls on axillary buds of *Cytisus scoparius* (L.) Link (Fabaceae). Harris (2002) redescribed this species and showed that it is distinct from *Asphondylia sarothamni* (Loew, 1850).
Occurrence. Zéralda (Gagné & Jaschhof 2017, Houard 1923).
Distribution. European, spread up to North Africa (Algeria); immigrant in USA (Washington, Oregon).

Asphondylia punica Marchal, 1897

Larvae cause large galls, up to several centimeters long, on the stems of *Atriplex halimus* L. (Chenopodiaceae) including the whole shoot on which all flower buds are changed into small galls,

each with one larva. Dorchin et al. (2014) redescribed *Asphondylia punica* and made *Asphondylia conglomerata* De Stefani, 1900 a junior synonym of *A. punica.*
Occurrence. Saint-Denis-du-Sig, Perrégaux, Dublineau, Ced-Ben-Yahia, Bou-Hanifia, Boghari, Seurat; Santa Cruz, Oran (Bequaert 1914, Dorchin et al. 2014, Houard 1901b, 1912e, 1921).
Distribution. Mediterranean.

Asphondylia scrophulariae Schiner, 1856

A solitary larva develops inside swollen flower bud of *Scrophularia canina* L. (Scrophulariaceae) where it also pupates.
Occurrence. Gorges de la Chiffa, Mascara (Bequaert 1914, Houard 1913).
Distribution. Mediterranean.

Asphondylia tavaresi (Rübsaamen, 1916)

A solitary larva develops iv swollen flower bud of *Lavandula stoechas* L. (Lamiaceae).
Occurrence. Alger, Kaddous (leg. R. Maire; Houard 1923).
Distribution. Mediterranean.

Asphondylia trabuti Marchal, 1896

One up to three larvae develop in a fruit of *Solanum tuberosum* L. and *S. commersonii* Dunal. (Solanaceae). Several generations develop per year. Larvae pupate in the galls.
Occurrence. Alger (type locality, leg. P. Marchal; Houard 1912e, 1913, 1917, Marchal 1896).
Distribution. Mediterranean.

Asphondylia verbasci (Vallot, 1827)

Larvae cause flower bud galls on *Verbascum lychnitis* L., *V. nigrum* L. and other species of the genus *Verbascum* (Scrophulariaceae). The cavity is lined with fungus. Two generations develop per year. Larvae pupate in the galls.
Occurrence. Kabylie, Port National, galls were found on *Verbascum kabylicum* Debeaux and *V. boerhavi* L. (Houard 1917, Mirumian 2001, Skuhravá 1980, 1987).
Distribution. Mediterranean and sub-Mediterranean, galls occur up to Armenia.

Baldratia algeriensis Möhn, 1969

Larvae cause slightly swelling of a part of stem of *Salsola longifolia* Forssk. (Chenopodiaceae). Only one chamber is inside the gall. Larvae pupate in galls. Usually two generations develop per year. Möhn (1969) described this species on the basis of material collected at Oran.
Occurrence. Oran (Möhn 1969).
Distribution. Mediterranean.

Baldratia salicorniae Kieffer, 1897

Larvae cause swellings on *Sarcocornia perennis* (Mill.) A. J. Scott and on *Salicornia fruticosa* L. (Chenopodiaceae). Larvae pupate in the galls. One generation develops per year.
Occurrence. Biskra (Dorchin & Freidberg 2008, Möhn 1969).
Distribution. United Kingdom, circum-Mediterranean, Eritrea.

Baldratia suaedae Möhn, 1969

Larvae cause oval galls on stem of *Suaeda vera* Gmelin (Chenopodiaceae), inside with one chamber. Two generations develop per year. Larvae pupate in the galls.
Occurrence. Biskra (Möhn 1969).
Distribution. Mediterranean. Galls were found in Algeria, Israel and Canarien Islands.

Bayeriola thymicola (Kieffer, 1888)

Larvae produce terminal or axillary rosette galls on *Thymus serpyllum* L. and other species of the genus *Thymus* (Lamiaceae). Two or more generations develop per year. Larvae pupate in the galls. In Algeria the galls were found on *Thymus ciliatus* Desf. and *T. coloratus* Boiss. et Rent.
Occurrence. Atlas de Blida, Mascara, Oranais, Sidi-Djilali (Bequaert 1914, Houard 1913c, 1921).
Distribution. European; galls occur up to Algeria.

Blastomyia origani (Tavares, 1901)

Larvae cause large bud galls on *Origanum vulgare virens* (Hoffmanns et Link) (Lamiaceae).
Occurrence. Algeria, without the name of the locality (Houard (1922–1923).
Distribution. European, up to North Africa (Morocco, Algeria).

Braueriella phillyreae (Löw, 1877)

Larvae cause pustule galls on leaves of *Phillyrea latifolia* L. (Oleaceae). Only one generation develops per year. Adults apper in the spring. Larvae pupate in the galls.
Occurrence. Alger, La Réghaia, El-Harrach (Houard 1912b, c, e, Neascu & Chapot 1979).
Distribution. Mediterranean.

Contarinia acerplicans (Kieffer, 1889)

Larvae cause leaf-fold galls on *Acer pseudoplatanus* L. and *A. campestre* L. (Aceraceae). Usually two generations develops per year.
Occurrence. Algeria; galls were found on *Acer obtusatum* Waldst. et Kit (Houard 1917, 1922–1923).
Distribution. European, galls are spread up to Algeria in North Africa.

Contarinia asperulae Kieffer, 1909

Larvae cause egg-shaped bud galls on *Asperula tinctoria* L. (Rubiaceae). Each gall is formed of several deformed leaves. Two or several generations develop per year.
Occurrence. Alger, galls were found on *Asperula hirsuta* Desf. (Bequaert 1914).
Distribution. European, galls are spread up to Algeria in North Africa.

Contarinia galii Kieffer, 1909

Larvae cause small fusiform galls on stem of *Galium lucidum* Allioni (Rubiaceae).
Occurrence. Beni-Besez, Babor (Houard 1913c).
Distribution. European; galls occur in France, Greece and are spread up to Algeria in North Africa.

Contarinia ilicis Kieffer, 1898

Larvae cause small galls on leaves of *Quercus ilex* L. (Fagaceae) with an opening on small pipe on the lower part of leaves.
Occurrence. Algeria, without the name of the locality (Kieffer 1898).
Distribution. Mediterranean; galls occur in southern France, Portugal, Italy, Greece and in Algeria.

Contarinia lini Simova et Skuhravá, 2007

Larvae develop in slightly swollen flower buds of *Linum austriacum* L. and *Linum strictum* L. (Linaceae). Two generations develop per year. Fully grown larvae leave the galls, fall to the soil, enter inside the soil where they pupate.
Occurrence. Bouzarea (Bequaert 1914, Simova & Skuhravá 2007).
Distribution. European; galls are known to occur in Serbia and Algeria.

Contarinia marchali Kieffer, 1896

Larvae develop inside swollen fruits of *Fraxinus excelsior* L. (Oleaceae). Only one generation develop per year.
Occurrence. Orléansville, Saint-Denis-du-Sig (Houard 1901b, 1912e).
Distribution. Eurosiberian; galls are spread from Europe up to Algeria in North Africa and to Western Siberia.

Contarinia nasturtii Kieffer, 1888

Larvae cause flower or leaf bud galls on several species and genera of the family Brassicaceae. It is a polyphagous species. Several generations develop a year. It is a pest, mainly in Europe.
Occurrence. Saint-Denis-du-Sig (*Erucastrum varium*), Arzew (*Cakile maritima* Scop.), Alger, Zéralda (*Sinapis arvensis* L.) (Darvas et al. 2000, Durieu & Bequaert 1914, Gagné & Jaschhof 2017, Houard 1902, Houard 1921–1923).
Distribution. Euro-Asian; immigrant in Canada (Ontario, Quebec), USA (New York, Minnesota).

Contarinia steini (Karsch 1881)

Larvae cause galls on flower buds of *Silene pratensis* (Rafn.) Godr. (= *Silene alba* Mill., *Melandrium album* Mill.), *Silene mellifera* Boiss. et Reut. and *Silene pseudo-atocion* Desf. (Caryophyllaceae).
Occurrence. Oran, Santa-Cruy, Zaccar (Houard 1921–1923).
Distribution. Widespread in Europe and western Asia.

Dasineura acrophila (Winnertz, 1853)

Larvae cause galls from leaflets of *Fraxinus excelsior* L. (Oleaceae). Attacked leaflet is folded upwards along midvein.
Occurrence. El-Harrach (Neascu & Chapot 1979).
Distribution. European, spread up to south-western Asia and North Africa.

Dasineura affinis (Kieffer, 1886)

Larvae cause galls on leaves of *Viola reichenbachiana* Jord. ex Boreau (= *V. sylvestris* Lam.) (Violaceae). Leaf margins are rolled up and thickened.
Occurrence. Environs of Alger (Houard 1912b, 1913b)
Distribution. Eurosiberian; galls are spread up to North Africa, Asia (Kazakhstan, Turkey).

Dasineura alpestris (Kieffer, 1909)

Larvae cause leaf bud galls on *Arabis alpina* L. and *A. hirsuta* (L.) Scop. (Brassicaceae). Attacked leaves remain small and are deformed, densely covered with whitish setae.
Occurrence. Monts de Djelfa, Ain-Bahrara (on *Arabis auriculata* Lam.) (Houard 1923).
Distribution. European; galls are spread up to North Africa.

Dasineura aparines (Kieffer, 1889)

Larvae cause large galls on the growing tips of *Galium aparine* L. (Rubiaceae).
Occurrence. Environs of Alger, Orléansville (Houard 1901b, 1912a, e).
Distribution. European; galls are spread up to North Africa.

Dasineura asparagi (Tavares, 1902)

Larvae cause galls at tips of young branches of *Asparagus aphyllus* L. (Liliaceae). The thorns remain small, are swollen and adpressed to swollen shortened stem. Under each deformed thorn one white larva develops.
Occurrence. Alger (Houard 1912e).
Distribution. Mediterranean.

Dasineura capsulae Kieffer, 1901

Larvae produce hard galls on the growing points of *Euphorbia cyparissias* L. (Euphorbiaceae).
Occurrence. Saint-Denis-du-Sig (Houard 1901b, 1912e).
Distribution. European; galls occur up to Northern Africa.

Dasineura coronillae (Tavares, 1901)

Larvae develop inside demormed leaflets of *Coronilla valentina* subsp. *glauca* (L.) Batt. (Fabaceae).
Occurrence. Alger (on *Coronilla juncea* L.) (Bequaert 1914).
Distribution. European up to North Africa.

Dasineura ericaescopariae (Dufour, 1837)

Larvae cause large galls on vegetative tips of *Erica scoparia* L., *Erica arborea* L. and other species (Ericaceae), up to 10 mm in diameter. Each gall contains several larvae.
Occurrence. Alger, Sidi-Ferruch (Houard 1912, 1913b).
Distribution. Mediterranean.

Dasineura fraxini (Bremi, 1847)

Larvae cause swellings of the mid-vein on the leaflets of *Fraxinus excelsior* L. (Oleaceae).
Occurrence. Orléansville, El-Harrach (Houard 1901b, 1912e, Neascu & Chapot 1979).
Distribution. European, galls occur up to Northern Africa.

Dasineura geisenheyneri (Kieffer, 1904)

Larvae live in swollen flower buds of *Hippocrepis comosa* L. (Fabaceae).
Occurrence. Sidi-Djilali (on *Hippocrepis scabra* DC.) (Houard 1923).
Distribution. European, galls occur up to North Africa.

Dasineura grasseti Barnes, 1935

Larvae cause small globular galls at the tip of branch of *Erica arborea* L. (Ericaceae). Usually only one larva develops in each gall.
Occurrence. Reghaia (type locality; Barnes 1935).
Distribution. Mediterranean.

Dasineura helianthemi (Hardy, 1850)

Larvae cause galls on leaf buds of *Helianthemum nummularium* (L.) Mill. (Cistaceae).
Occurrence. Tablat, environs of Alger (Houard 1901d, 1912a, c, Skuhravá (1997).
Distribution. European; galls occur up to North Africa.

Dasineura napi (Loew, 1850)

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. In Europe it is a serious pest of oilseed rape in rape-growing areas.
Occurrence. Orléansville (on *Sinapis alba* L.) (Darvas et al. 2000, Houard 1901b).
Distribution. European, galls occur up to North Africa.

Dasineura oleae (Löw, 1885)

Larvae cause slight, indefinite, elongate swellings on the leaves of *Olea europaea* L. (Oleaceae). Galls are rather more visible on the lower surface than on the upper surface. It is a serious pest of olive tree in the Mediterranean.
Occurrence. Alger (Bequaert 1914, Doğanlar et al. 2011).
Distribution. Mediterranean.

Dasineura peyerimhoffi (Kieffer, 1919)

Larvae cause bud galls at the basis of the branch of *Coronilla valentina* L. (Fabaceae).
Occurrence. Oued Djer (type locality); Zaouia des Mouzaia (Kieffer 1919).
Distribution. Mediterranean.

Dasineura plicatrix (Loew, 1850)

Larvae cause galls formed by contorted and twisted young leaves of *Rubus caesius* L. and other species of the genus *Rubus* (Rosaceae).
Occurrence. Alger, El-Harrach (Neascu & Chapot 1979, Sinclair et al. 2009).
Distribution. European, with large distribution area spread up to North Africa and to Western Asia (Turkey); immigrant in North America (British Columbia).

Dasineura rufescens (De Stefani, 1898)

Larvae cause globular or fusiform swellings on branches of *Phillyrea latifolia* L. (= *Phillyrea media* L. (Oleaceae).
Occurrence. El-Harrach (Neascu & Chapot 1979, Skuhravá et al. 2005).
Distribution. Mediterranean, reaching up to Turkey.

Dasineura sampaina (Tavares, 1902)

Larvae cause artichoke gall at the tip of the shoot of *Linum bienne* Miller (= *L. angustifolium* Hudson) and *Linum usitatissimum* L. (Linaceae). The gall is formed of broadened leaves. Only one white larva develops in the centre of each gall.
Occurrence. Bouzarea (on *Linum strictum* L.); Alger, Kaddons (on *Linum corymbiferum* Desf.), Constantine (on *Linum maritimum* L.) (Bequaert 1914).
Distribution. European, galls occur up to North Africa and Western Asia (Georgia).

Dasineura strumosa (Bremi 1847)

Larvae develop in swollen leaf buds on young shoots of *Lamium galeobdolon* (L.) Nath. (Lamiaceae). The galls are formed usually on buds under the ground.
Occurrence. Guerrouch, 1913, on *Lamium flexuosum* Ten (Houard 1913c).
Distribution. European, galls occur up to North Africa.

Dasineura trifolii (Löw, 1874)

Larvae develop in pod-like folded leaflets of *Trifolium repens* L. and other species of the genus *Trifolium* (Fabaceae).
Occurrence. El-Harrach (Gagné & Jaschhof 2017, Neascu & Chapot 1979).
Distribution. Eurosiberian, immigrant in USA.

Dasineura tubicoloides Gagné, 2004

Larvae cause tubular galls from leaf buds on stems of *Cytisus* (*Sarothamnus*) *scoparius* (L.) Link (Fabaceae).
Occurrence. Aurés, Sgag, 1700 m a. s. l. (on *Cytisus balansae* Boiss. et Reut.) (Houard 1923).
Distribution. European.

Dasineura turionum (Kieffer et Trotter, 1904)

Larvae develop under the scale-shaped and swollen young leaves on very young eary growths on shoots of *Asparagus acutifolius* L. (Liliaceae).

Occurrence. L'Alma (Houard 1913c).
Distribution. Mediterranean.

Dasineura viciae (Kieffer, 1888)

Larvae live gregariously in pod-like folded and hypertrophied leaflets of *Vicia sepium* L. and other species of the genus *Vicia* (Fabaceae).
Occurrence. Debrousseville, Alger (on *Vicia desperma* DC.) (Houard 1913c, 1921).
Distribution. Eurosiberian.

Dasineura zillae (Kieffer, 1909)

Larvae cause flower bud galls on *Zilla spinosa* (L.) Prantl (Brassicaceae).
Occurrence. Algeria (Houard 1915: 90).
Distribution. Mediterranean.

Dryomyia cocciferae (Marchal, 1897)

Larvae cause galls on leaves of *Quercus coccifera* L. (Fagaceae).
Occurrence. Alger, Saint-Denis-du-Sig, Djebel Edough, El-Harrach. Type locality: Bouzarea near Alger (Bequaert 1914, Houard 1912e, Neascu & Chapot 1979, Schneider-Orelli 1912).
Distribution. Mediterranean.

Dryomyia liechtensteini (Löw, 1978)

Larvae cause galls on leaves of *Quercus ilex* L. (Fagaceae).
Occurrence. Saint-Denis-du-Sig, Mascara, Oranais, Sidi-Djilali, El-Harrach (Bequaert 1914, Houard 1901b, 1912e, 1921, Neascu & Chapot 1979).
Distribution. Mediterranean.

Ephedromyia sp. 1

Larvae cause fusiform swelling of the stem of *Ephedra fragilis* Desf. (Gnetaceae), 12 mm long and 5 mm thick, with a central chamber including several larvae or pupae.
Occurrence. Ain-Sefra, Djebel Mekter (on *Ephedra fragilis*); Djelfa, Djebel Ougtaia (Houard 1912e, 1923, Schneider-Orelli 1912).
Distribution. Mediterranean.

Ephedromyia sp. 2

Larvae cause globular swelling on stem of *Ephedra fragilis* Desf. (Gnetaceae), 4–7 mm in diameter.
Occurrence. Batna (Houard 1921).
Distribution. Mediterranean.

Etsuhoa thuriferae Skuhravá, 1996

Larvae cause large rounded or ovoid galls, composed of many shortened leaves, on branches of *Juniperus thurifera* L. (Cupressaceae).

Occurrence. Aurés, Sgag (Houard 1923).
Distribution. Mediterranean.

Geocrypta galii (Loew, 1850)

Larvae cause globular swellings on stems and flower stalks of *Galium mollugo* L., *G. verum* L. and other species of the genus *Galium* (Rubiaceae).
Occurrence. Alger and environs of Alger (on *Galium saccharatum* All.), Maison (on *Galium tunetanum* L.), Oran, Djebel Mourdjadja (on *Galium brunneum* Munby) (Bequaert 1914, Houard 1901d, 1912, 1921).
Distribution. Eurosiberian.

Iteomyia peyerimhofi (Kieffer, 1909)

Larvae cause small galls on lower side od leaves of *Salix pedicellata* Desf. (Salicaceae). Galls are covered with small protuberances.
Occurrence. Kabylie, Camp-du-Maréchal, Cédres de Dra-Inguel, 1500 m a. s. l., Boghni, Mascara (Bequaert 1914, Houard 1912e, Kieffer 1909).
Distribution. Mediterranean.

Jaapiella bryoniae (Bouché, 1847)

Larvae cause large leaf bud galls galls on *Bryonia alba* L. (Cucurbitaceae).
Occurrence. Saint-Denis-du-Sig, Oran (Bequaert 1914, Houard 1901b, 1912e).
Distribution. European, galls occur up to North Africa.

Lasioptera carophila Löw, 1874

Larva causes a swelling at the point of insertion of umbellules in inflorescences of many species and genera of Apiaceae.
Occurrence. Atlas de Blida (on *Ptychotis atlantica* Coss. et Durieu), Birmandreis near Alger (on *Elaeoselimum Fontanesii* Boiss.) (Bequaert 1914, Houard 1917).
Distribution. European, occurring in south-western Asia and North Africa.

Lasioptera eryngii (Vallot, 1829)

Larvae cause plurilocular swellings of stems and leaf petioles of *Eryngiu*m *campestre* L. and *E. maritimum* L. (Apiaceae).
Occurrence. Cap Haokas (on *Eryngium maritimum* L.), Aures, Sgag (on *Eryngium campestre* L.) (Houard 1921, 1923, Skuhravá 1980, 1987).
Distribution. Submediterranean.

Lasioptera nigrocincta Kieffer, 1904

A male was reared from galls of *Plagiotrochus* (*Dryocosmus*) *australis* (Mayr, 1882) (Hymenoptera: Cynipidae) on the leaves of oak *Quercus* sp. (Fagaceae). This species has not been found since Kieffer's time. Original material is lost.
Occurrence. Algeria: Philippeville (Kieffer 1904).
Distribution. Mediterranean.

Lasioptera thapsiae Kieffer, 1898

Larvae produce large multilocular swellings at the base of umbels on *Thapsia garganica* sp. and *Thapsia garganica* L. (Apiaceae). Galls may reach up to 15 mm in diameter and include several chambers, each with one larva. Kieffer (1898) desribed this species based on material found in Algeria.
Occurrence. Alger (type locality), Birmandreis (on *Elaeoselinum fontanesii* Boiss.) (Bequaert 1914, Houard 1912e, 1923, Kieffer 1898).
Distribution. Mediterranean.

Lasioptera umbelliferarum Kieffer 1909

Larvae cause plurilocular swellings on stems and leaf stalks of *Hippomarathrum* sp. (formerly *Seseli*) (Apiaceae). Dorchin & Freidberg (2011) redescribed this species.
Occurrence. Near Alger (on *Hippomarathrum pterochlaenum* Boiss.) (Bequaert 1914, Dorchin & Freidberg 2011, Skuhravá & Skuhravý 2010).
Distribution. Euro-Asian, with disjunct area of distribution.

Lauthia ilicis (Kieffer, 1919)

A male was caught on dead wood of *Ilex aquifolium* L. (Aquifoliaceae) in Mai. Nothing more is known about the biology of this species.
Occurrence. Dra-Inguel, Haizer-Djurdjura (type locality; Kieffer 1919).
Distribution. Mediterranean.

Ledomyia ramicola (Kieffer, 1919)

Adults were reared from dead branches of *Fraxinus oxyphylla* Marsch. (Oleaceae).
Occurrence. Farghen, Mazafran (type locality; Kieffer 1919).
Distribution. Mediterranean.

Mayetiola avenae (Marchal, 1895)

Larvae cause onion-shaped galls on stem of *Avena sativa* L. (Poaceae).
Occurrence. Algeria, without giving the name of the locality (Houard 1913c).
Distribution. European, galls occur up to Nord Algeria.

Mayetiola destructor (Say, 1817)

Larvae cause swellings on the lower part of the stem on *Triticum aestivum* L. (*T. vulgare* Vill.), *Secale cereale* L., *Hordeum vulgare* L. and occasionally also on various species of weed grasses (Poaceae). At present, it is a minor pest of cereals in Europe, but the main pest of cereals in North America.
Occurrence. Algeria, without giving the name of the locality (Darvas et al. 2000, Miller et al. 1989, Skuhravá et al. 1984).
Distribution. Palaearctic, widespread in Europe, western Asia and northern Africa; immigrant in North America and New Zealand.

Mayetiola hordei Kieffer, 1909

Larvae cause galls on the stem of *Hordeum vulgare* L. (Poaceae). Gagné et al. (1991) demonstrated that it is an separate species, not a synonym of *Mayetiola destructor* (Say, 1817).
Occurrence. Algeria (Gagné et al. 1991).
Distribution. European, occurring up to North Africa (Morocco, Algeria).

Myricomyia mediterranea (Löw, 1885)

Larvae cause small rosette galls on twigs of *Erica arborea* L. and related species (Ericaceae). Only one larva occurs in the gall.
Occurrence. Mount Djebel-Edough, 1010 m a. s. l. (Houard 1901d, 1912e).
Distribution. Mediterranean.

Oligotrophus panteli Kieffer, 1898

Larvae cause galls on *Juniperus communis* L. and *J. oxycedrus* L. (Cupressaceae). The gall has a bulbous base and pointed apex.
Occurrence. Saida, Sidi-Bel-Abbes, Batna (Houard 1901b, 1912e, 1913b).
Distribution. European; galls occur up to North Africa.

Oligotrophus valerii (Tavares, 1904)

Larvae cause large pear-shaped galls on *Juniperus oxycedrus* L. (Cupressaceae).
Occurrence. Saida, Sidi-Bel-Abbes, Arzew (Bequaert 1914, Houard 1912).
Distribution. Mediterranean.

Orseolia cynodontis Kieffer et Massalongo, 1902

Larvae cause galls on *Cynodon dactylon* Pers. (Poaceae). The gall is oval and consists of several malformed leaves massed together at the extremity of the shoot forming a tube. Inside the gall is a solitary larva which pupates in the gall.
Occurrence. Saida, Sidi-Bel-Abbés, Saint-Denis-du-Sig, Orléansville, Maison-Carrée (Barnes 1946, Houard 1901b, 1912e, 1913c).
Distribution. Mediterranean.

Ozirhincus anthemidis (Rübsaamen, 1915)

A single larva develops inside a chamber of a swollen achene in the flower head of *Anthemis arvensis* L. (Asteraceae).
Occurrence. Kabylia, Kap Aokas (type locality; Möhn 1968).
Distribution. European, up to Algeria and Turkey.

Ozirhincus longicollis Rondani, 1840

A single larva develops inside a chamber of a swollen achene in the flower head of several species and genera of Asteraceae.
Occurrence. Teniet-es-Sebt, Kabylei (on *Santolina rosmarinifolia* L.; Asteraceae) (Möhn 1966).
Distribution. European, occurring up to North Africa (Algeria).

Phyllodiplosis cocciferae Tavares, 1902

Larvae live in swollen leaf buds of *Quercus coccifera* L. (Fagaceae).
Occurrence. Alger, Seurat (Bequaert 1914, Houard 1912e).
Distribution. Mediterranean.

Primofavilla aegyptiaca Elsayed, 2015

Larvae cause blister galls on leaves of *Atriplex halimus* L. (Chenopodiaceae).
Occurrence. Saint-Denis-du-Sig (Elsayed et al. 2015, Houard 1901b, 1912e).
Distribution. Mediterranean (Egypt, Algeria).

Probrugmanniella phillyreae (Tavares, 1907)

Larvae develop in swollen fruits of *Phillyrea latifolia* L. (= *P. media* L.; Oleaceae).
Occurrence. El-Harrach (Neascu & Chapot 1979).
Distribution. Mediterranean.

Psectrosema tamaricum (Kieffer, 1912)

Larvae cause small ovoid or fusiform swellings on young leaf branches and on flowering shoots of *Tamarix africana* Poiret, *T. gallica* L. and some other species of *Tamarix* (Tamaricaceae). Inside the gall is a large cavity in which the solitary larva develops and also pupates.
Occurrence. Saint-Denis-du-Sig (type locality); Biskra (Houard 1902, 1912e, Kieffer 1912).
Distribution. Mediterranean.

Rabdophaga salicis (Schrank, 1803)

Larvae cause obvious, woody, fusiform or spherical, plurilocular swelling on the branches of *Salix cinerea* L., *S. aurita* L., and *S. caprea* L. (Salicaceae).
Occurrence. Beni-Besez, at altitude of 1000 m a. s. l. (on *Salix pedicellata* L.) (Houard 1913c).
Distribution. Euro-Siberian species with large distribution area**.**

Rhopalomyia campestris (Rübsaamen, 1915)

Larvae cause small leaf bud galls on *Artemisia campestris* L. (Asteraceae).
Occurrence. Bou-Saada (Houard 1901d, 1912e).
Distribution. European, galls occur up to North Africa.

Rhopalomyia navasi Tavares, 1904

Recent records. Mesbah-Marhoum, Province Sidi Bel Abbes, 34°20’58”N, 0°04’22”W, 1058 m a. s. l., high plains in steppe, not mountains, 15 April 2015, leg. N. Salemkour; near the village Sfid – Sidi Ahmed, Provence Saida, 34°28’43”N, 0°00’32”W, 1094 m a. s. l., high plains in steppe, not mountains, 17 April 2015, leg. N. Salemkour.

Larvae cause densely white pubescent galls on stems of *Artemisia herba-alba* Asso and *A. incana* (L.) Druce (Asteraceae). Galls are situated on stem sides. Several chambers occur inside one gall. In each chamber only one larva develops where it also pupates. The gall of this species was discovered in Spain and adults were described by Tavares (1904).

Occurrence. In the past the galls of *Rhopalomyia navasi* were foundby by Houard & Schneider--Orelli at the following localities: Oran, Hassi Souina, Birin, Ain-Sefra (Houard 1901c, 1912d, e, Schneider-Orelli 1912, Tavares (1904).
Distribution. Mediterranean, known to occur in Spain, Romania, Morocco, Algeria, Tunisia, Libya, Egypt, Syria, Iran, Jordan, Iraq.

Rhopalomyia producticeps Kieffer, 1912

Larvae cause tubular galls on stems of *Artemisia herba-alba* Asso (Asteraceae). Inside the gall it is only one chamber with one larva. It pupates in the gall.
Occurrence. Saint-Denis-du-Sig (type locality; Houard 1901a, 1901b, 1912).
Distribution. Mediterranean.

Rhopalomyia setubalensis (Tavares, 1902)

Larvae cause small whitish galls at the base of leaves of *Santolina rosmarinifolia* L. var. *vulgaris* (Asteraceae).
Occurrence. Djebel-Morghad, at an altitude of 1950 m a. s. l. (Houard 1912e).
Distribution. Mediterranean.

Rhopalomyia tubifex (Bouché, 1847)

Larvae produce tubular galls on leaf axils, stems and change into tubular galls the flower heads of *Artemisia campestris* L. (Asteraceae).
Occurrence. Djelfa (Houard 1917).
Distribution. Eurosiberian, Sub-Mediterranean.

Schizomyia buboniae (Frauenfeld, 1859)

Larvae cause strange, berry-like galls on thin stems of *Deverra tortuosa* (Desf.) DC (Apiaceae).
Occurrence. Ced-Ben-Yahia; Sud-Oranais; Bou-Saada (on *Deverra chlorantha* Coss. et Durieu); Béni-Ounif and Figuig (on *Deverra scoparia* Cosson) (Houard 1901d, 1912e, Schneider-Orelli 1912).
Distribution. Mediterranean.

Schizomyia galiorum Kieffer, 1889

Larvae develop swollen flower buds of *Galium mollugo* L. and other species of the genus *Galium* (Rubiaceae).
Occurrence. Babor (on *Galium tunetanum* Lam.); Méchéria; Djebel-Antar (on *G. lucidum* All.) (Houard 1917).
Distribution. Euro-Siberian.

Silvestriola ficorum Barnes, 1932

Larvae are associated with dried figs of *Ficus* sp. (Moraceae).
Occurrence. Bougie (type locality; Barnes 1932).
Distribution. Mediterranean.

Spurgia euphorbiae (Vallot. 1827)

Larvae cause galls on *Euphorbia cyparissias* L. (Euphorbiaceae).
Occurrence. Fort-de-l'Eau (on *Euphorbia pubescens* Vahl) (Gagné & Jaschhof 2017, Houard 1912c).
Distribution. European; immigrant in Canada and USA.

Stefaniella atriplicis Kieffer, 1898

Larvae cause small swellings on stem of *Atriplex halimus* L. (Chenopodiaceae). Iinside the gall are several chambers.
Occurrence. Saint-Denis-du-Sig (type locality); Ced-Ben-Yahia (Gagné & Jaschhof 2017, Houard 1912c, Kieffer 1898).
Distribution. Submediterranean. The galls of *Stefaniella atriplicis* were found in Italy, Czech Republic, former Yugoslavia, Greece, Russia, and Algeria.

Stefaniella trinacriae De Stefani, 1900

Larvae cause large fusiform plurilocular swellings of stems of *Atriplex halimus* L. (Chenopodiaceae) of a size of a nut, inside with many chambers.
Occurrence. Saint-Denis-du-Sig, Ced-Ben-Yahia (Houard 1901b, d, 1912e).
Distribution. Submediterranean; galls occur in Spain, Italy, Malta, Greece, Algeria and Israel.

Stefaniola bilobata (Kieffer, 1913)

Larvae cause small elongated bud galls on *Salsola vermiculata* L. (Chenopodiaceae). Larvae pupate in the gall.
Occurrence. Oran, Santa Cruz (Möhn 1971).
Distribution. Mediterranean.

Stefaniola gloma Möhn, 1971

Larvae cause swellings on flower stem of various species of the genus *Salsola vermiculata* L. and other species of *Salsola* (Chenopodiaceae).
Occurrence. Biskra (type locality; Möhn 1971).
Distribution. Mediterranean; galls occur in Spain, Algeria, Egypt, Israel and Syria.

Stefaniola mediterranea Möhn, 1971

Larvae cause swellings on the stem of *Salicornia europaea* L. and *Halocnemum strobilaceum* (Pall.) (Chenopodiaceae). Only one chamber is in each gall. Larvae pupate in the galls.
Occurrence. Biskra (Möhn 1971).
Distribution. Mediterranean (Italy, Algeria).

Stefaniola nucula Möhn, 1971

Larvae cause galls on leaves of *Nucularia perrinii* Battandier (Chenopodiaceae).
Occurrence. Oued Incoki, Sahara (type locality; Möhn 1971).
Distribution. Mediterranean (Algeria).

Stefaniola salsolae (Tavares, 1904)

Larvae cause bud galls on *Salsola vermiculata* L. (= *S. microphylla* Mocq.) (Chenopodiaceae). The bud is changed into rosa-shaped fleshy gall, up to the size of 15–18 mm, inside with a chamber. The surface of the gall is covered with many small, hairy leaves.
Occurrence. Santa-Cruz, near Oran (Houard 1912).
Distribution. Mediterranean; galls occur in Spain, Portugal, Algeria and Tunisia.

Stefaniola tripla Möhn, 1971

Larvae cause small swellings on stems of *Haloxylon schmittianum* Pomel (Chenopodiaceae).
Occurrence. Biskra (type locality; Möhn 1971).
Distribution. Mediterranean (Algeria).

Stefaniola unita Möhn, 1971

Larvae cause swellings on the stem of *Haloxylon schweinfurthii* Aschers and *H. schmittianum* Pomel.(Chenopodiaceae). Galls have dick walls and one or two chambers.
Occurrence. Biskra (Möhn 1971).
Distribution. Mediterranean; galls occur in Algeria, Tunisia and Egypt.

Stefaniola vastita Möhn, 1971

Larvae cause galls on *Anabasis articulata* (Forsk.) Moq. and *A. prostrata* Pomel (Chenopodiaceae). Galls are globular and have 10 mm in diameter.
Occurrence. Laghouat, Biskra (type locality; Houard 1921, Möhn 1971).
Distribution. Mediterranean. Galls occur in Spain, Algeria, Egypt, Israel and Jordan.

Wachtliella caricis (Loew, 1850)

Solitary larva develops in swollen fruits in the inflorescences of *Carex riparia* L. and *C. muricata* L. (Cyperaceae).
Occurrence. Alger, Bouzarea near Alger (on *Carex distans* L.), Kabylia, Fort-National (Bequaert 1914, Houard 1917).
Distribution. European, galls occur up to North Africa.

Wachtliella ericina (Löw, 1885)

Larvae produce small rosette galls on the growing tips of *Erica carnea* L. (Ericaceae).
Occurrence. Alger, Djebel-Edough, 1010 m a. s. l.; Terni near Tlemcen (on *Erica arborea* L.) (Houard 1901d, 1912a, e, Schneider-Orelli 1912).
Distribution. Submediterranean, subatlantic.

Undescribed species

Cecidomyiidae sp.

Small pustule on the leaf of *Acer obtusatum* Walldst. (Aceraceae).
Occurrence. Saint-Denis-du-Sig (Babor 1912, Houard 1913c).

Cecidomyiidae sp.

Small membranous pustule on the leaf of *Ceratonia siliqua* L. (Fabaceae).
Occurrence. Saint-Denis-du-Sig (Houard 1901a, b, Houard 1912e).

Cecidomyiidae sp.

Swollen flower bud of *Fagonia cretica* L. (Zygophyllaceae).
Occurrence. Saint-Denis-du-Sig; Saint-Denis-du-Sig; Houard (1923: 143): Oran, Nemours, as Cécidomyide, leg. R. Maire (Houard 1901b, 1912e).

Cecidomyiidae sp.

Swollen part of stem on *Lotus creticus* L. (Fabaceae). Swollen part has 5 mm in diameter.
Occurrence. Dunes de Zéralda (Houard 1913c).

DISCUSSION

Species richness

The fauna of gall midges in Algeria including 109 valid species which belong to 43 genera (Table 1), may be evaluated as rich. It is the richest fauna of five countries spread along the Mediterranean Sea in North Africa. In comparison, the gall midge fauna of Morocco includes 57 species (Skuhravá et al. 2017), of Egypt 48 species (Skuhravá et al. 2014), Tunisia 40 and of Libya only 15 species. Species richness of gall midges in Algeria is the result of activities of several researchers who undertook scientific journey to Algeria to collect galls on plants at the beginning of the twentieth century. They collected galls and reared adults from galls which they sent to J. J. Kieffer, the prominent specialist on gall midges of that time, for identification of causers. Twenty five species of gall midges were decribed on the basis of material collected in Algeria where these species have their type localities.

Two species of gall midges, *Asphondylia punica* causing large galls on stems of *Atriplex halimus* and *Rhopalomyia navasi* inducing white pubescent galls on stems of *Artemisia herba-alba* are the most abundant species of gall midges in Algeria. Galls of both species were found scattered at several localities in northern part of Algeria. Other species of gall midges were recorded rarely, usually only at one, two or three localities.

From the point of view of species richness at the genus level, the most species rich genus in Algeria is *Dasineura* including twenty five species, followed by *Asphondylia* with ten species, *Contarinia* with eight species and *Stefaniola* with seven species.

On the basis of larval feeding habits, most of the species occurring in Algeria are phytophagous and their larvae cause galls on various host plants. Only ten species of gall midges are mycophagous and their larvae feed mainly on fungal hyphae. Most of them belong to subfamily Lestremiinae and Porricondylinae. Two species - *Aphidoletes aphidimyza* and *Arthrocnodax clematitis* are zoophagous and their larvae attack various small arthropods.

Phytophagous species of gall midges are associated with 83 host plant species which belong to 65 genera of 29 plant families. Chenopodiaceae is the plant family hosting the highest number of gall midges, it hosts sixteen species. Other plant families host only one, two or three species of gall midges.

About three quarter of host plant species are herbaceous plants and only one quarter trees or shrubs. Usually only one species of gall midge is associated with one host plant species; two species

Table 1. List of host plants and gall midges associations of Algeria

host plant species	gall midge species
Acer obtusatum	*Contarinia acerplicans*, Cecidomyiidae sp.
Anabasis articulata, *A. prostrata*	*Stefaniola vastita*
Anthemis punctata	*Ozirhincus anthemidis*
Arabis alpina	*Dasineura alpestris*
Artemisia campestris	*Rhopalomyia campestris*, *R. tubifex*
Artemisia herba-alba	*Rhopalomyia navasi*, *R. producticeps*
Asparagus aphyllus	*Dasineura asparagi*
Asparagus acutifolius	*Dasineura turionum*
Asperula hirsuta	*Contarinia asperule*
Atriplex halimus	*Primofavilla aegyptiaca*, *Stefaniella atriplicis*, *S. atriplicis*
Atriplex patula	*Aplonyx chenopodii*, *Asphondylia punica*
Avena sativa	*Mayetiola avenae*
Brassica napus	*Dasineura napi*
Bryonia alba	*Jaapiella bryoniae*
Cakile maritima	*Contarinia nasturtii*
Calycotome spinosa	*Asphondzlia calycotome*
Capparis spinosa	*Asphondylia capparis*
Carex distans	*Wachtliella caricis*
Ceratonia siliqua	Cecidomyiidae sp.
Coronilla juncea	*Asphondylia coronillae*
Coronilla valentina	*Dasineura coronillae*, *Dasineura peyerimhoffi*
Cynodon dactylon	*Orseolia cynodontis*
Cytisus balansae	*Dasineura tubicoloides*
Cytisus scoparius	*Asphondylia pilosa*, *Dasineura tubicoloides*
Cytisus triflorus	*Asphondylia cytisi*
Deverra tortuosa	*Schizomyia buboniae*
Elaeoselimum fontanesii	*Lasioptera carophila*, *L. thapsiae*
Ephedra fragilis	*Ephedromyia* sp. 1, *Ephedromyia* sp. 2
Erica arborea	*Dasineura ericaescopariae*, *D. grassei*, *Myricomyia mediterrnea*, *Wachtliella ericina*
Erucastrum varium	*Contarinia nasturtii*
Eryngium campestre, *E. maritimum*	*Lasioptera eryngii*
Euphorbia cyparissias	*Dasineura capsulae*
Euphorbia pubescens	*Spurgia euphorbiae*
Fagonia cretica	Cecidomyiidae sp.
Ficus sp.	*Silvestriola ficorum*
Fraxinus excelsior	*Contarinia marchali*, *Dasineura acrophilla*, *D. fraxini*
Galium aparine	*Dasineura aparines*
Galium lucidum	*Contarinia galii*, *Schizomyia galiorum*
Galium saccharatum	*Geocrypta galii*
Galium tunetanum	*Schizomyia galiorum*
Halocnemum strobilaceum	*Stefaniola mediterranea*
Haloxylon schmittianum	*Stefaniola tripla*, *S. unita*
Helianthemum nummularium	*Dasineura helianthemi*
Hippocrepis comosa	*Dasineura geisenheyneri*
Hippomarathrum pterochlaenum	*Lasioptera umbelliferarum*
Hordeum vulgare	*Mayetiola destructor*, *Mayetiola hordei*
Juniperus communis	*Oligotrophus panteli*
Juniperus oxycedrus	*Oligotrophus valerii*
Juniperus thurifera	*Etsuhoa thuriferae*
Lamium flexuosum	*Dasineura strumosa*
Lavandula stoechas	*Asphondylia tavaresi*
Linum austriacum	*Contarinia lini*
Linum strictum	*Dasineura sampaina*

Table 1. (continued)

host plant species	gall midge species
Lotus creticus	Cecidomyiidae sp.
Nucularia perrinii	*Stefaniola nucula*
Olea europaea	*Dasineura oleae*
Origanum vulgare	*Blastomyia origani*
Phillyrea latifolia	*Braueriella phillyreae*, *Dasineura rufescens*, *Probrugmanniella phillyreae*
Ptychotis atlantica	*Lasioptera carophila*
Pulicaria odora	*Acodiplosis pulicariae*
Rubus caesius	*Dasineura plicatrix*
Quercus coccifera	*Dryomyia cocciferae*, *Phyllodiplosis cocciferae*
Quercus ilex	*Contarinia ilicis*, *Dryomyia lichtensteini*
Salicornia fruticosa	*Baldratia salicorniae*
Salicornia europaea	*Stefaniola mediterranea*
Salix pedicellata	*Iteomyia peyerimhofi*, *Rabdophaga salicis*
Salsola longifolia	*Baldratia algeriensis*
Salsola vermiculata	*Stefaniola bilobata*, *S. gloma*, *S. salsolae*
Santolina rosmarinifolia	*Ozirhincus longicollis*, *Rhopalomyia setubalensis*
Scrophularia canina	*Asphondylia scrophulariae*
Silene mellifera	*Contarinia steini*
Solanum tuberosum	*Asphondylia trabuti*
Suaeda vera	*Baldratia suaedae*
Tamarix africana	*Psectrosema tamaricum*
Thapsia garganica	*Lasioptera thapsiae*
Thymus	*Bayeriola thymicola*
Trifolium repens	*Dasineura trifolii*
Verbascum	*Asphondylia verbasci*
Vicia desperma	*Dasineura viciae*
Viola reichenbachiana	*Dasineura affinis*
Zilla spinosa	*Dasineura zillae*

of gall midge are associated with twelve host plant species. Each of four host plants – *Atriplex halimus*, *Fraxinus excelsior*, *Phillyrea latifolia*, and *Salsola vermiculata* – is associated with three species of gall midges. *Erica arborea* is the host plant with the highest number of gall midges. Four species of gall midges cause galls on this host plant: *Dasineura ericaescopariae*, *Dasineura grasseti*, *Myricomyia mediterranea*, and *Wachtliella ericina.*

Geographical distribution

The gall midge species occurring in Algeria may be divided, according to their overall distribution in the world, into five zoogeographic units: Mediterranean, European, Eurosiberian, Palaearctic and Holarctic. Of 109 species of gall midges occurring in Algeria, the majority – 62 species (57%) are Mediterranean, 33 species (30%) European, ten species (8%) Eurosiberian, three species are Holarctic and only one species, *Mayetiola destructor* have Palaearctic distribution, occurring in Europe, western Asia, Northern Africa (Morocco, Algeria and Tunisia), and as an immigrant also in Nearctic and in New Zealand.

Mediterranean species have centres of origin in the Mediterranean area. They occur along the shores of the Mediterranean and are associated with Mediterranean host plants. Some of them occur over greater areas and a few species reach the northern limits of their distribution areas even in Central Europe. In such cases they are designated as submediterranean species. In Algeria

sixty two species, forming more than a half of all species found there, belong in this group, as for example eight species of the genus *Asphondylia* and seven species of the genus *Stefaniola*.

European species are associated with European host plant species that have centres of origin in Europe. They may reach marginal parts of Asia. In Algeria thirty three species (30%) belong in this group, as for example *Contarinia nasturtii*, *Dasineura napi*, and *Dasineura plicatrix* are typical representatives of European species. They occupy large distribution areas from Britain and Portugal in Western Europe to Greece in Eastern Europe, to Algeria and Morocco in northern Africa.

Euro-Siberian species inhabit the Euro-Siberian subregion of the Palaearctic region. They have centres of origin in Europe where they occur, usually abundantly, and extend at least to Western Siberia, with some of them reaching to Central Siberia and only a few reaching to Eastern Siberia and to the most eastern part of the Palaearctic Region, to the Far East. They may also reach marginal parts of Asia and northern Africa. In Algeria ten species belong in this group: *Contarinia marchali*, *C. nasturtii*, *Dasineura affinis*, *D. trifolii*, *D. viciae*, *Geocrypta galii*, *Lasioptera umbelliferarum*, *Rabdophaga salicis*, *Rhopalomyia tubifex*, and *Schizomyia galiorum.*

Holarctic species occur simultaneously in the Palaearctic and in the Nearctic regions. In Algeria three species belong in this group: *Micromya lucorum*, *Cedrocrypta montana*, and *Aphidoletes aphidimyza.*

Mayetiola destructor is a **Palaearctic** species. It occurs in Europe, western Asia, North Africa (Morocco, Algeria, and Tunisia) and has been brought in North America where it is considered to be an immigrant, similarly as in New Zealand.

Economic importance

In Algeria, no significant pests belonging to gall midges in agriculture and forestry were recorded, either in the past or in the present. It is necessary to be watchful and control agricultural plants and prevent them before attack of pests and their injury which could penetrate from surrounding or from distant countries. The following species of gall midges may be evaluate as potential pests of agricultural plants in Algeria: *Mayetiola destructor*, *M. hordei*, and *M. avenae* on cereals, of them *M. destructor* is the most important pest; *Contarinia nasturtii*, damaging species of the family Brassicaceae, namely *Brassica* (cultivated forms) and *Raphanus sativus*.

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