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# ANNOTATED CHECK-LIST OF PTEROMALIDAE (HYMENOPTERA: CHALCIDOIDEA) OF MOROCCO. PART II

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## ABSTRACT

In this second part, we present the subfamily Pteromalinae in Morocco, which includes 86 species belonging to 50 genera. Fifteen genera and 37 species are listed for the first time in the Moroccan fauna, among which 9 have been newly identified, 24 have been found in the bibliography and 4 deposited in natural history museums. An updated list of Moroccan species is given, including their distribution by regions, their general distribution and their hosts.

**Keywords:** Pteromalinae; distribution; hosts; new record; Morocco; Palaearctic Region.

## RESUMEN

**Lista comentada de Pteromalidae (Hymenoptera: Chalcidoidea) de Marruecos. Parte II**

En esta segunda parte, presentamos la subfamilia Pteromalinae en Marruecos, que incluye 86 especies pertenecientes a 50 géneros. Quince géneros y 37 especies se enumeran por primera vez en la fauna marroquí, de las cuales 9 han sido recientemente identificadas, 24 se han encontrado en la bibliografía y 4 están depositadas en museos de historia natural. Se proporciona una lista actualizada de especies marroquíes, incluida su distribución por regiones, su distribución general y sus huéspedes.

**Palabras clave:** Pteromalinae; distribución; hospedadores; nuevo registro; Marruecos; Región Paleártica.

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## Introduction

The Pteromalidae is a speciose and very diverse family of mostly parasitoid wasps (the number was greater, but many species and genera have been reduced to synonymy in recent years) (Gibson *et al.*, 1999). The subfamily-level divisions are highly contentious and unstable, and the family is unquestionably artificial, composed of numerous, distantly related groups (polyphyletic) (Carpenter, 1992; Török & Abraham, 2002; Munro *et al.*, 2011).

Accordingly, their life histories range over nearly the entire possible spectrum within the Chalcidoidea, though the majority of the species are larval or pupal parasitoids attacking many orders across Insecta. They can be categorized into many groups i.e. endoparasitoids and ectoparasitoids; hyperparasitoids; primary or secondary parasitoids; solitary or gregarious species;

inquilines or kleptoparasitoids of a wide variety of insects and arachnids, or phytophagous gall-formers (Parker & Thompson, 1925; Kerrich & Graham, 1957; Szczepanski, 1960; Bouček, 1963, 1977, 1988; Parnell, 1964; Askew, 1965; Graham, 1969; Burks, 1979; Bouček & Rasplus, 1991; Ghahari & Huang, 2012; Mitroiu, 2012, 2017; Noyes, 2020).

The second part of our contribution to the Pteromalidae fauna of Morocco follows the first part (treating the subfamilies Asaphinae, Cerocephalinae, Cleonyminae, Eunotinae, Macromesinae, Miscogastrinae, Ormocerinae, Pireninae, Spalangiinae and Sycoryctinae) (Kissayi *et al.*, 2019) and includes only the subfamily Pteromalinae Dalman, 1820.

## Material and methods

This work has been carried out in several stages. The first stage devoted to the compilation of all the available literature, was supplemented by visiting national and international museums and consulting databases devoted to Chalcidoidea, notably the richest and the most frequently updated one edited by Noyes (2020). The final stage of this inventory included material collected with Malaise traps at three sites within the Maâmora forest (see Kissayi *et al.*, 2019).

Abbreviations used in the text

CIRAD Center for International Cooperation in Agricultural Research for Development, Montpellier, France;
ETHZ Entomological Institute of E.T.H., Zurich, Switzerland;
MCHN Museo Civico di Storia Naturale, Genova;
NMBE Natural History Museum Berne, Switzerland;
RBINS Royal Belgian Institute of Natural Sciences, Brussels, Belgium.

## Results

For each species we provide its known distribution in Morocco (as Morocco when no exact locality is available), insect hosts and general distribution. New data are marked with an asterisk.

Subfamily **Pteromalinae** Dalman, 1820

Genus ***Anisopteromalus*** Ruschka, 1912

***Anisopteromalus calandrae*** (Howard, 1881)

Distribution in Morocco. Essaouira, 2 ♀♀ (Vago, 2002: 95); Rabat, 1 ♀, 13.V.1963 (ETHZ) (Baur *et al.*, 2014: Annexe S1: 5).

Insect hosts. Coleoptera: Anobiidae (De Santis, 1979, 1980; Bouček, 1988), Anthribidae (Goncalves *et al.*, 1976), Apionidae (Herting, 1973), Bostrichidae (Ahmed & Kabir, 1995; Helbig, 1998), Bruchidae (Yoshida & Hidaka, 1979; Haeselbarth, 1985; Asl *et al.*, 2009), Curculionidae (Farooqi & Subba Rao, 1986), Dermestidae (Nutting & Gerhardt, 1964), Dryophthoridae (Williams & Floyd, 1971; Mitroiu, 2001), Nitidulidae (Thompson, 1958), Silvanidae (Ahmed, 1996), Tenebrionidae (Sureshan & Narendran, 2003); Hymenoptera: Pteromalidae (Begum, 1994); Lepidoptera: Gelechiidae (Smith *et al.*, 1995), Pyralidae (Graham, 1969; Pereira, 1998).

General distribution. Afrotropical, Nearctic, Neotropical, and Palaearctic Regions.

Genus ***Caenocrepis*** Thomson, 1878

***Caenocrepis arenicola*** (Thomson, 1878)

Distribution in Morocco. Haouta el Kasdir (about 15 km S of Chauen, Jebala), 1850 m, 1 ♀, 4.-11.VII.1961 (Delucchi, 1962b: 13); Rabat, 1 ♀, 29.IV.1992 (Vago, 2002: 96).

Insect hosts. Coleoptera: Curculionidae (Haeselbarth, 1989; Mitroiu, 2012).

General distribution. Palaearctic Region.

Genus ***Callitula*** Spinola, 1811*

***Callitula bicolor*** Spinola, 1811*

Distribution in Morocco. Fez Region; Meknes region, many ♀ and ♂ (Klein, 1995: abstract only).

Insect hosts. Diptera: Cecidomyiidae (Askew *et al.*, 2001), Chloropidae (Bouček, 1964), Opomyzidae (Vidal, 1997). In Morocco, this species has been reared from *Phytomyza orobanchia* Kaltenbach, 1864 (Diptera, Agromyzidae) parasite of *Orobanche* spp. (Orobanchaceae) (Klein & Kroschel, 2002).

General distribution. Palaearctic and Nearctic Region.

Genus ***Catolaccus*** Thomson, 1878

***Catolaccus crassiceps*** (Masi, 1911)

Distribution in Morocco. Rabat; 1 ♀, 25.VII.1993; 1 ♂, 31.VII.1993; 10 km S Azrou, 1 ♀, 9.VIII.1993 (Vago, 2002: 96), Province of Tata: Tichekji, 29°54′36″N 8°31′48″W, Sidi Moulay Cherif, 30°39′36″N 6°33′36″W; Taroudant, 30°29′24″N 8°51′W (Stefanescu *et al.*, 2012: 91).

Insect hosts. Coleoptera: Curculionidae (Farooqi & Subba Rao, 1986); Hymenoptera: Cynipidae (Dehdar & Madjdzadeh, 2013); Lepidoptera: Gelechiidae, Pyralidae (Sureshan & Narendran, 2003), Noctuidae (Singh *et al.*, 1983); Pieridae (Verma *et al.*, 1976); Neuroptera: Chrysopidae (Dzhanokmen, 1980).

General distribution. Palaearctic Region and India.

Genus ***Cecidostiba*** Thomson, 1878*

***Cecidostiba fungosa*** (Geoffroy, 1785)*

Distribution in Morocco. Taza, 2 ♀♀, 1 ♂, between 12.II. and 19.III.1951, V. Delucchi leg. (Delucchi, 1962b: 13).

Insect hosts. Hymenoptera: Cynipidae (Thompson, 1958; Graham, 1969; Herting 1977; Dzhanokmen, 1978; Tudor & Căruntu, 1980; Garrido Torres & Nieves-Aldrey, 1999; Melika *et al.*, 2002; Askew *et al.*, 2013; Doğanlar, 2014).

General distribution. Palaearctic Region.

Genus ***Cheiropachus*** Westwood, 1829

***Cheiropachus quadrum*** (Fabricius, 1787)

Distribution in Morocco. Taroudant; Douar Aguerd-Oudad; Tasserirt; Béni Mellal; Béni Ayat; Timoulilt (Benazoun, 1988: 97); Tadla (Graf, 1977: only abstract); Ras El Ma; Azrou; Aïn Kahla (Mouna, 2013: 9).

Insect hosts. Coleoptera: Bostrichidae (Thompson, 1958), Cerambycidae Herting, 1973, Curculionidae (Bouček, 1977; Burks, 1979; Mendel, 1986; Yang, 1989; Öncüer, 1991; Campos & Lozano, 1994; Mitroiu, 2001; Buhroo et *al.*, 2002; Olenici *et al.*, 2015); Lepidoptera: Cossidae (Tawfik & Ramadan, 2006), Erebidae (Herting, 1976). In Morocco, this species was reared from *Scolytus amygdali* Guérin-Meneville, 1847 (= *Scolytus* (*Ruguloscolytus*) *amygdali* Guérin-Meneville, 1847) (Coleoptera: Curculionidae: Scolytinae) living on almond trees (Benazoun, 1988) as well as on *Hylesinus oleiperda* (Fabricius, 1792) (Coleoptera: Curculionidae: Scolytinae) living on olive trees (Graf, 1977). Also, this species has been reported as a parasitoid of wood-consuming beetles, mainly the Curculionidae (Mouna, 2013).

General distribution. Nearctic, Neotropical, Palaearctic Regions and India.

Genus ***Coelopisthia*** Förster, 1856*

***Coelopisthia extenta*** (Walker, 1835)*

Distribution in Morocco. Sidi Bettache, 1 ♀, 1 ♂, 21.II.1961; Oued Cherrat, 3.IV.1961; Mechraâ Belksiri, 6.IV.1961; Sidi Slimane, 18.IV.1961, V. Delucchi leg. (Delucchi, 1962a: 124).

Insect hosts. Coleoptera: Curculionidae (Coles & Puttler, 1963; Clancy, 1969; Flanders, 1972; Bouček, 1961); Hemiptera: Coccidae (Herting, 1972); Lepidoptera: Arctiidae (Boriani, 1994; Garrido Torres & Nieves-Aldrey, 1999), Geometridae (Dzhanokmen, 1978), Noctuidae (Grijpma, 1988), Tortricidae (Graham, 1969; Askew, 1980).

General distribution. Palaearctic Region, United States of America.

Genus ***Conomorium*** Masi, 1924

***Conomorium patulum*** (Waker, 1835)

Distribution in Morocco. Fez, 25.II.1939 (Bléton & Fieuzet, 1939: 62); Mechraâ Belksiri (Gharb), 2 ♀♀, 15.II.1961; Kénitra, 15.I.1962 (Delucchi, 1962b: 14); Ras El Ma; Azrou; Aïn Kahla (Mouna, 2013: 9).

Insect hosts. Diptera: Anthomyiidae (Herting, 1978); Lepidoptera: Arctiidae (Graham, 1969; Zelenev, 1974; Bouček, 1961), Geometridae (Herting, 1976), Gracillariidae (Celli, 1964), Lasiocampidae (Graham, 1969), Erebidae (Haeselbarth, 1989), Lyonetiidae (Herting, 1975), Noctuidae (Göven & Efil, 1994), Notodontidae (Ghahari *et al.*, 2010), Tineidae (Thompson, 1958). In Morocco, this species has been reported as a parasite of the larvae of the cabbage fly *Delia radicum* (Linnaeus, 1758) (= *Hylemyia brassicae* Bouché) (Diptera: Anthomyiidae) (Bléton & Fieuzet, 1939). Also, it was obtained as parasitoid larvae and nymphs of *Thaumetopoea pityocampa* (Denis & Schiffermüller, 1775) (Lepidoptera: Notodontidae) (Mouna, 2013).

General distribution. Palaearctic Region.

***Conomorium pityocampae*** Graham 1992*

Distribution in Morocco. Ras El Ma, Azrou, Aïn Kahla (Mouna, 2013: 9).

Insect hosts. Lepidoptera: Notodontidae especially the genus *Thaumetopoea* Hübner, 1820 (Graham, 1992; Vidal, 1997; Garrido Torres & Nieves-Aldrey, 1999; Askew *et al.*, 2001). In Morocco, this species has been reported as a parasitoid of the pupae of *Thaumetopoea pityocampa* (Lepidoptera: Notodontidae) (Mouna, 2013).

General distribution. Palaearctic Region.

Genus ***Cratomus*** Dalman, 1820*

***Cratomus megacephalus*** (Fabricius, 1793)*

Material examined. Maâmora Forest, canton D, commune Aïn Johra, Al Maha, 1 ♂, 14.V.2014, K. Kissayi leg.

Insect hosts. Hymenoptera: Sphecidae (Ghahari & Huang, 2012).

General distribution. Palaearctic Region and United States of America.

Genus ***Cyclogastrella*** Bukovskii, 1938

***Cyclogastrella clypealis*** Bouček, 1965

Distribution in Morocco. Morocco (Baur, 2000: 172).

Insect hosts. Unknown.

General distribution. Palaearctic Region.

***Cyclogastrella simplex*** (Walker, 1834)

Distribution in Morocco. The plain of Gharb: Mechraâ Belksiri, 1 ♀, 15.II.1961, V. Delucchi leg. (Delucchi, 1962a: 123); Aïn Kahla, Azrou, Ras El Ma (Mouna, 2013: 9).

Insect hosts. Lepidoptera: Gelechiidae (Thompson, 1958), Tortricidae (Garrido Torres & Nieves-Aldrey, 1999). In Morocco, this species was obtained as a secondary parasitoid of pupae of *Acleris undulana* (Walsingham, 1900) (Lepidoptera: Tortricidae) (Mouna, 2013).

General distribution. Nearctic and Palaearctic Regions.

Genus ***Cyrtogaster*** Walker, 1833

***Cyrtogaster vulgaris*** Walker, 1833

Distribution in Morocco. Ifrane, 1 600 m, Middle Atlas, 1 ♂, 1 ♀, 24.V.II.1960; the surroundings of Rabat, 1 ♀, 1 ♂, 30.XI.1960, 10.II.1961; Mechraâ Belksiri, 1 ♀, 1 ♂, 15.II.1961; Lalla Mimouna, 1 ♀, 1 ♂, 15.II.1961; along the road between Kenitra and Souk el Tleta (Gharb) a month later; Kenitra, 1 ♀, 1 ♂, between 11-31.I.1962; Berrechid (south of Casablanca), 1 ♀, 1 ♂, 6.III.1961 (Delucchi, 1962b: 14); Rabat, 1 ♂, 21.XII.1992 (Vago, 2002: 96).

Insect hosts. Coleoptera: Bruchidae (Andriescu & Mitroiu, 2001); Diptera: Agromyzidae (Bouček, 1961; Graham, 1969; Dzhanokmen, 1978; Godfray, 1985; Fry, 1989; Trandem, 1996; Askew *et al.*, 2001; Mitroiu, 2001), Chloropidae (Askew, 1965; Garrido Torres & Nieves-Aldrey, 1999), Drosophilidae, Lonchaeidae, Lonchopteridae (Herting, 1978), Opomyzidae, Syrphidae (Vidal, 1997), Tephritidae (OILB, 1971); Hemiptera: Aphididae (Heydon, 1989); Hymenoptera: Cynipidae (Askew, 1965); Lepidoptera: Lasiocampidae (Herting, 1976).

General distribution. Palaearctic Region, Canada and United States of America.

Genus ***Cyrtoptyx*** Delucchi, 1956

***Cyrtoptyx lichtensteini*** (Masi, 1922)

Distribution in Morocco. The lower valley of Moulouya; Guercif, 1 ♂, 1 ♀, during the year 1960, J.J. Drea leg., B.D. Burks det.; region of Fez (Delucchi, 1962a: 123).

Insect hosts. Coleoptera: Curculionidae (Graham, 1969; Herting, 1973; Dzhanokmen, 1978); Diptera: Tephritidae (Amini *et al.*, 2014); Lepidoptera: Pyralidae (Herting, 1975; De Santis, 1983).

General distribution. North Africa, France, Iran, Kazakhstan, China, Puerto Rico, United States of America.

Genus ***Dibrachoides*** Kurdjumov, 1913

***Dibrachoides dynastes*** (Förster, 1841)

Distribution in Morocco. Rabat, 1 ♀, 21.IV.1992 (Vago, 2002: 96).

Insect hosts. Coleoptera: Curculionidae (Thompson, 1958; Peck, 1963; Graham, 1969; Herting, 1973; Bouček, 1977; Dzhanokmen, 1978; Burks, 1979); Hemiptera: Carsidaridae (Öncüer, 1991).

General distribution. Canada, United States of America and Palaearctic Region.

Genus ***Dibrachys*** Förster, 1856

***Dibrachys affinis*** Masi, 1907

Distribution in Morocco. Aïn Leuh (Middle Atlas), 3 ♀♀, 10.VIII.1993 (Vago, 2002: 96).

Insect hosts. Diptera: Calliphoridae (Graham, 1969); Lepidoptera: Gelechiidae (Öncüer, 1991), Erebidae (Herting, 1976, 1977), Sesiidae (Herting, 1975), Tortricidae (OILB, 1971; Haeselbarth, 1989; Baur, 2005), Yponomeutidae (Thompson, 1958).

General distribution. Palaearctic Region.

***Dibrachys lignicola*** Graham, 1969

Distribution in Morocco. Mamora, 2 ♀♀, 1 ♂ [under *D. Cavus* (Walker, 1835)] (Peters & Baur, 2011: 25); Ras El Ma; Azrou; Aïn Kahla (Mouna, 2013: 9).

Insect hosts. Diptera: Calliphoridae, Hippoboscidae (Peters & Baur, 2011); Hymenoptera: Diprionidae (Doğanlar, 1987); Lepidoptera: Notodontidae, Tortricidae (Peters & Baur, 2011). In Morocco, this species was reared from *Apanteles* sp. (Hymenoptera: Braconidae) living on *Lymantria dispar* (Linnaeus, 1758) (Lepidoptera: Erebidae: Lymantriinae) (Peters & Baur, 2011) as well as on chrysalids of *Thaumetopoea pityocampa* (Lepidoptera: Notodontidae) (Mouna, 2013).

General distribution. Palaearctic Region and United States of America.

***Dibrachys microgastri*** (Bouché, 1834)

Material examined. Maâmora Forest, canton D, commune Kceïbia, Aïn Assou, 1 ♀, 29.VIII.2012; Maâmora Forest, canton A, commune Sidi Taïbi, Taïcha, 1 ♀, 14.V.2014, K. Kissayi leg.; Maâmora Forest, 3 ♀♀, [under *Dibrachys boucheanus* (Ratzeburg, 1844)].

Distribution in Morocco. Maâmora forest (De Lépiney, 1927: 161), Middle Atlas [under *D. boarmiae* (Walker, 1863)] (Peters & Baur, 2011: 20); Ras El Ma; Azrou; Aïn Kahla (Mouna, 2013: 9).

Insect hosts. Coleoptera: Anobiidae, Bruchidae (Peck, 1963), Cerambycidae (Thompson, 1958), Coccinellidae (Burks, 1979), Cucujidae (Thompson, 1958), Curculionidae (Bouček & Sedivy, 1954; Yang, 1996), Dryophthoridae (Burks, 1979), Trogossitidae (Peters & Baur, 2011); Dermaptera: Forficulidae (Herting, 1971); Diptera: Agromyzidae (Herting, 1978), Calliphoridae, Hippoboscidae (Peters & Baur, 2011), Muscidae (Floate *et al.*, 1999), Tephritidae (Peck, 1963); Hemiptera: Pseudococcidae (Thompson, 1958); Hymenoptera: Apidae (Öncüer, 1991), Cephidae (Peters & Baur, 2011), Diprionidae (Herting, 1977), Sphecidae (Vago, 2006), Tenthredinidae (De Santis, 1983), Vespidae (Baur, 2005); Lepidoptera: Arctiidae (Bouček, 1954), Bucculatricidae (Myartseva *et al.*, 1999), Choreutidae, Coleophoridae (Peters & Baur, 2011), Erebidae (Haeselbarth, 1983), Gelechiidae (Vidal, 1993), Geometridae (Konno *et al.*, 2002), Glyphipterygidae (Burks, 1979), Gracillariidae (Gorksa-Drabik & Napiorkowlik-Kowalik, 2009), Lasiocampidae (Herting, 1978), Lyonetiidae (Vidal, 1993), Noctuidae, Notodontidae (Burks, 1979), Nymphalidae (Askew, 1970), Oecophoridae, Pieridae (Peters & Baur, 2011), Psychidae (Kulman, 1965), Pterophoridae (Herting, 1975), Pyralidae (Kamijo, 1983; Mitroiu, 2001), Saturniidae (Peck, 1963), Sesiidae (Dobroserdov, 1971), Tineidae (Mehrnejad, 2003), Tortricidae (Oatman *et al.*, 1983), Yponomeutidae (Unruh *et al.*, 1993), Zygaenidae (Herting, 1976); Neuroptera: Chrysopidae (Herting, 1978), Hemerobiidae (Peters & Baur, 2011), Sympherobiidae (Burks, 1979) and Araneae: Araneidae, Thomisidae (Burks, 1979). In Morocco, this species was obtained from the parasitoid complex of *Lymantria dispar* (Lepidoptera: Erebidae: Lymantriinae) (De Lépiney, 1927), so it was bred from larva (?) of *Thaumetopoea pityocampa* (Lepidoptera: Notodontidae) on *Cedrus atlantica* (Endl.) G.Manetti ex Carrière, (Pinaceae) (Peters & Baur, 2011). Also, it has been noted as a secondary parasitoid of caterpillars and chrysalis of *Acleris undulana* (Walsingham, 1900) (Lepidoptera: Tortricidae) (Mouna, 2013).

General distribution. Australian, Indo-Malay, Afrotropical, Palaearctic, Nearctic and Neotropical Regions.

Genus ***Dinarmoides*** Masi, 1924**

***Dinarmoides spilopterus*** Masi, 1924**

Material examined. Sidi Allal El Bahraoui, Shoul, 1 ♀, 10.VII.2105, K. Kissayi leg.

Insect hosts. Unknown.

General distribution. Palaearctic Region and Yemen.

Genus ***Dinarmus*** Thomson, 1878

***Dinarmus acutus*** (Thomson, 1878)

Distribution in Morocco. Ifrane, 1 ♀, 24.VII.1960, V. Delucchi leg. (Delucchi, 1962a: 123).

Insect hosts. Coleoptera: Bruchidae (Peck, 1963; Graham, 1969; Dzhanokmen, 1978; Burks, 1979; Boe *et al.*, 1989; Abdul-Rassoul, 1990; Thuròczy, 1990; Garrido Torres & Nieves-Aldrey, 1999); Hemiptera: Coccidae (OILB 1971; Öncüer, 1991); Hymenoptera: Pteromalidae (Herting, 1973).

General distribution. Afrotropical, Nearctic and Palaearctic Regions.

***Dinarmus basalis*** (Rondani, 1877)*

Material examined. Maâmora Forest, canton D, Kceïbia commune, Aïn Assou, 1 ♀, 22.VIII.2012; 1 ♀, 29.VIII.2012; 2 ♂♂, 14.VIII.2012, K. Kissayi leg.

Insect hosts. Coleoptera: Apionidae, Brentidae (Herting, 1973), Bruchidae (Peck, 1963; Bouček, 1974; Burks, 1979; Dzhanokmen, 1978), Dermestidae (Farooqi & Subba Rao, 1986; Sureshan & Narendran, 2003).

General distribution. Afrotropical, Indo-Malay, Nearctic, Neotropical and Palaearctic regions.

Genus ***Dinotiscus*** Ghesquière, 1946*

***Dinotiscus eupterus*** (Walker, 1836)*

Distribution in Morocco. Aïn Kahla; Azrou; Ras Al Ma (Mouna, 2013: 9).

Insect hosts. Coleoptera: Curculionidae (Thompson, 1958; Graham, 1969; Herting, 1973; Garrido Torres & Nieves-Aldrey, 1999; Hougardy & Gregoire, 2001). In Morocco, this species was obtained as a parasitoid of saproxylophagous insects on the Atlas cedar (Mouna, 2013).

General distribution. New Zealand, Nearctic and Palaearctic regions.

Genus ***Erythromalus*** Gahan, 1956*

***Erythromalus* sp.***

Material examined. Maâmora Forest, Canton A, Sidi Taïbi commune, Taïcha, 1 ♀, 2.IV.2014, K. Kissayi leg.

Remarks. The specimen could be a new species for science and, if confirmed, it will be published later.

Genus ***Fedelia*** Delucchi, 1962

***Fedelia nebulosa*** Delucchi, 1962

Distribution in Morocco. Tarfaya: Oued Namoussa, 10 km southeast of El Khaloua, 2 ♀♀, 30.IV.1961, Mesbahi leg. (Delucchi, 1962a: 115).

Insect hosts. Unknown.

General distribution. Palaearctic Region (Algeria, Canary Islands and Morocco).

Genus ***Hobbya*** Delucchi, 1957*

***Hobbya stenonota*** (Ratzeburg, 1848)*

Distribution in Morocco. Region of Taza, 4 ♀♀, 5 ♂♂, between 26.III. and 6.IV.1951 (Delucchi, 1962b: 14).

Insect hosts. Hymenoptera: Cynipidae (Thompson, 1958; Graham, 1969; Dzhanokmen, 1978; Garrido Torres & Nieves Aldrey, 1999; Melika *et al.*, 2002; Gómez *et al.*, 2006; Vago, 2006; Askew *et al.*, 2013).

General distribution. Palaearctic Region.

Genus ***Homoporus*** Thomson, 1878

***Homoporus budensis*** Erdös, 1953*

Distribution in Morocco. Haouta el Kasdir, in Jebala, 15 km southeast of Chauen, 1 ♀, 4.-11.VII.1961 (Delucchi, 1962b: 14-15).

Insect hosts. Hymenoptera: Cynipidae (Graham, 1969; Askew *et al.*, 2006, 2013).

General distribution. Palaearctic Region (Hungary, Morocco, Moldova, Slovakia, Sweden).

***Homoporus destructor*** (Say, 1817)

Distribution in Morocco. Chaouïa, VII.1932, Bouhélier leg. (Jourdan & Rungs, 1934: 213), coastal region of El Jadida, since 1932 (Jourdan, 1937: 53); Bouznika, many ♂ and ♀, 6.IV.1961; Oued Cherrat arboretum, 20.II. and 3.IV.1961; Rabat, 28.III. and 12.IV.1961; in the plain of Gharb: Sidi Slimane, 18.IV.1961 (Delucchi, 1962a: 121-122).

Insect hosts. Diptera: Cecidomyiidae (Thompson, 1958; Dzhanokmen, 1978; Schuster & Lidell, 1990), Chloropidae (Graham, 1969; Garrido Torres & Nieves-Adlrey, 1999); Hymenoptera: Cephidae (Dubbert *et al.*, 1998), Eurytomidae (Vidal, 1997); Lepidoptera: Erebidae (Peck, 1963).

General distribution. Palaearctic Region, Canada, United States of America.

***Homoporus fulviventris*** (Walker, 1835)*

Distribution in Morocco. Fir forest of Talassemtane National Park, Y. Benyahia leg. (Benyahia, 2016: 167).

Insect hosts. Hymenoptera: Cynipidae (Askew *et al.*, 2001; Gómez *et al.*, 2006), Eurytomidae (Thompson, 1958; Bouček, 1966; Herting, 1977).

General distribution. Palaearctic Region.

***Homoporus gibbiscuta*** (Thomson, 1878)*

Material examined. Maâmora forest, Sidi Taïbi commune, Taïcha, 1 ♂, 08.V.2014; 1 ♀, 26.VI.2012; 2 ♂♂, 03.VII.2012; Maâmora forest, Aïn Johra commune, Al Maha, 2 ♂♂, 14.V.2014; 1 ♀, 02.IV.2014; 2 ♂♂, 14.V.2014; 1 ♀, 26.IX.2012; Maâmora forest, Kceïbia commune, Aïn Assou, 1 ♂, 17.IV.2014, K. Kissayi leg.

Distribution in Morocco. The surroundings of Rabat, 1 ♂, 1 ♀, 28.III.1961 (Delucchi 1962a: 121).

Insect hosts. Unknown.

General distribution. Palaearctic Region.

***Homoporus nypsius*** (Walker, 1839)

Distribution in Morocco. Atlantic Morocco: Bouznika, 1 ♀, 5.IV.1961 (Delucchi, 1962a: 122); Rabat, 1 ♂, 29.IV.1992 (Vago 2002: 96).

Insect hosts. Coleoptera: Curculionidae (Thompson, 1958); Diptera: Cecidomyiidae (Garrido Torres & Nieves-Aldrey, 1992, 1999; Askew *et al.*, 2001); Hymenoptera: Eurytomidae (Graham, 1969; Dzhanokmen, 1978; Burks, 1979), Torymidae (Peck, 1963; Mitroiu & Andriescu, 2003).

General distribution. Nearctic and Palaearctic Regions.

***Homoporus rungsi*** Delucchi, 1962

Distribution in Morocco. Western Morocco, Arboretum Oued Cherrat (plateau) on the national road Rabat-Casablanca, 1 ♀ holotype, 1 ♂ allotype, 3.IV.1961, Bouznika, on the same road, a few kilometers further south-west, 1 ♀, 4.IV.1961 (Delucchi, 1962a: 121).

Insect hosts. Unknown.

General distribution. Endemic species of Morocco.

***Homoporus silvanus*** Delucchi, 1962

Distribution in Morocco. Haouta el Kasdir, 1850 m, 15 km south-east of Chauen, in Jebala, 1 ♀, 4.-11.VII.1961 (Delucchi, 1962b: 15).

Insect hosts. Unknown.

General distribution. Endemic species of Morocco.

***Homoporus sucinus*** Delucchi, 1962

Distribution in Morocco. Rabat, ♀ Type unique, 28.III.196l (Delucchi, 1962a: 120).

Hosts. Unknown.

General distribution. Endemic species of Morocco.

Genus ***Ischyroptyx*** Delucchi, 1956

***Ischyroptyx ligusticus*** (Masi, 1921)

Distribution in Morocco. Rabat, 1 ♀, 4 ♂♂, 27.VII.1993; same locality, 1 ♀, 2.VIII.1993, Mehdiya shores of Lake Sidi Boughaba, 1 ♀, VIII.1994 (Vago 2002: 97).

Insect hosts. Unknown.

General distribution. Palaearctic Region.

Genus ***Lariophagus*** Crawford, 1909

***Lariophagus distinguendus*** (Förster, 1841)

Distribution in Morocco. Tangier; Igli; Larache; Essaouira; Gharb; Rabat; Marrakech; Taroudant; Beni Msuar; Oujda; Casablanca and region (De Lépiney & Mimeur, 1932: 29, 39, 42, 43, 61); Meknes, many ♀♀, 24.VII.1960; Ifrane, 24.VII.1960 (Delucchi, 1962a: 123); Essaouira, 1 ♀, X.1983; Rabat, 1 ♀, I.1990 (Vago, 2002: 97).

Insect hosts. Coleoptera: Anobiidae (Peck, 1963), Bostrichidae (Burks, 1979), Bruchidae (Graham, 1969), Curculionidae (Öncüer, 1991), Dryophthoridae (Burks, 1979; Mitroiu, 2001), Ptinidae (Herting, 1973), Tenebrionidae (Vago, 2006); Diptera: Cecidomyiidae (Thompson, 1958); Hymenoptera: Pteromalidae (Ambriz *et al.*, 1996).

General distribution. Australia, Nearctic, Neotropical and Palaearctic Regions.

Genus ***Meraporus*** Walker, 1834

***Meraporus graminicola*** Walker, 1834

Material examined. Maâmora Forest, Canton D, Kceïbia Commune, Aïn Assou, 1 ♀, 27.XI.2013; 1 ♀, 25.XII.2013, K. Kissayi leg.

Distribution in Morocco. Casablanca region, 6 ♀♀ and 1 ♂, 1930 (Jourdan & Rungs, 1934: 212), Témara, 4.II.1961; near Rabat, 28-29.III.1961; Oued Cherrat, 3.IV.1961, Mechraâ Bel Ksiri, 15.II. and 6.IV.1961; region of Fez, since 1938 (Bléton & Fieuzet, 1939: 61); Fez region, many ♂♂ and ♀♀ wingless and winged individuals, I.V1961; V.1961, near Meknes 4.IV.1960; Bouznika, 28.III.1961 (Delucchi, 1962a: 124); Rabat, 1 ♀, 23.XII.1992; around Azrou, 6 ♀♀, VIII.1993 (Vago, 2002: 97).

Insect hosts. Diptera: Cecidomyiidae (Graham, 1969; Dzhanokmen, 1978; Garrido Torres & Nieves-Aldrey, 1999; Mitroiu & Andriescu, 2003).

General distribution. Palaearctic Region.

Genus ***Merisus*** Walker, 1834*

***Merisus splendidus*** Walker, 1834*

Distribution in Morocco. Morocco's North-Atlantic littoral zones: Rabat, Oued Cherrat, Berrechid, Casablanca; Mohammedia; Bouznika; Kénitra; Larache; Tanger, 1 ♂, 1 ♀, between 6.III. and 3.IV.1961 (Delucchi, 1962a: 122).

Insect hosts. Hymenoptera: Eurytomidae (Graham, 1969; Askew *et al.*, 2001); Lepidoptera: Glyphipterygidae (Abdullah *et al.*, 1989).

General distribution. Palaearctic Region.

Genus ***Mesopolobus*** Westwood, 1833

***Mesopolobus amaenus*** (Walker, 1834)*

Distribution in Morocco. Fir forest of Talassemtane National Park, 31.VII.2014, Y. Benyahia leg. (Benyahia, 2016: 173).

Insect hosts. Diptera: Cecidomyiidae (Graham, 1969; Askew, 1999); Hymenoptera: Cynipidae (Herting, 1977; Garrido Torres & Nieves-Aldrey, 1999; Gómez *et al.*, 2006; Askew *et al.*, 2013); Lepidoptera: Erebidae (Lymantriinae) (Haeselbarth, 1983).

General distribution. Palaearctic Region.

***Mesopolobus diffinis*** (Walker, 1834)*

Distribution in Morocco. Haouta el Kasdir, in Jebala, 15 km southeast of Chauen, 1 ♀, 1 ♂, H. von Rosen det. (Delucchi, 1962b: 16); Fir forest of Talassemtane National Park, Y. Benyahia leg. (Benyahia, 2016: 173).

Insect hosts. Diptera: Cecidomyiidae (Graham, 1969; Herting, 1978; Garrido Torres & Nieves Aldrey, 1992; Askew *et al.*, 2001; Askew & Harris, 2007); Lepidoptera: Yponomeutidae (Bouček, 1977).

General distribution. Palaearctic Region.

***Mesopolobus gemellus*** Baur & Muller, 2007*

Distribution in Morocco. Fir forest of Talassemtane National Park, Y. Benyahia leg. (Benyahia, 2016: 173).

Insect hosts. Coleoptera: Curculionidae (Baur *et al.*, 2007).

General distribution. Palaearctic Region.

***Mesopolobus incultus*** (Walker, 1834)

Distribution in Morocco. Talasoltane, Rif, 1850 m, 4 ♀♀, 4. and 11.VII.1961, collected by sweeping, (NMBE) (Baur *et al.*, 2007: 393).

Insect hosts. Coleoptera: Apionidae (Askew *et al.*, 2001; Bouček, 1966), Curculionidae (Graham, 1969; Herting, 1973; Garrido Torres & Nieves Aldrey, 1992); Diptera: Agromyzidae, Cecidomyiidae (Herting, 1978); Hymenoptera: Eurytomidae (Herting, 1977).

General distribution. Palaearctic Region, Canada, and New Zealand.

***Mesopolobus morys*** (Walker, 1848)*

Distribution in Morocco. Haouta el Kasdir, l850 m, 15 km southeast of Chauen, in Jebala, (Delucchi, 1962b: 16); Fir forest of Talassemtane National Park, Y. Benyahia leg. (Benyahia, 2016: 168).

Insect hosts. Coleoptera: Apionidae (OILB, 1971; Mitroiu, 2005), Curculionidae (Peck, 1963; Bouček, 1977; Burks, 1979; Baur *et al.*, 2007); Diptera: Cecidomyiidae (Herting, 1978; Askew *et al.*, 2001).

General distribution. Nearctic and Palaearctic Region.

***Mesopolobus nobilis*** (Walker, 1834)*

Material examined. Maâmora Forest, Canton A, Sidi Taïbi commune, Taïcha, 1 ♀, 14.V.2014, Maâmora forest, Canton D, Aïn commune Johra, Al Maha, 1 ♀, 8.V.2014, K. Kissayi leg.

Distribution in Morocco. Fir forest of Talassemtane National Park (Benyahia, 2016: 173).

Insect hosts. Coleoptera: Apionidae (Herting, 1973).

General distribution. Palaearctic Region, United States of America and New Zealand.

***Mesopolobus spermotrophus*** Hussey, 1960*

Distribution in Morocco. Aïn Kahla, Azrou, Ras El Ma (Mouna, 2013: 9).

Insect hosts. Hymenoptera: Torymidae [*Megastigmus spermotrophus* Wachtl, 1893] (Bouček, 1971; Herting, 1977; Baur, 2005). In Morocco, this species has been reported as a secondary parasitoid? of pupae of *Acleris undulana* (Lepidoptera: Tortricidae) (Mouna, 2013).

General distribution. Western Palaearctic Region, New Zealand and United States of America.

***Mesopolobus teliformis*** (Walker, 1834)*

Distribution in Morocco. Oued Yquem (between Rabat and Casablanca), a few kilometers from its mouth, many ♂ and ♀, 4.VII.1960 (Delucchi, 1962b: 16).

Insect hosts. Hemiptera: Diaspididae (Xiao *et al.*, 2016).

General distribution. Palaearctic Region.

***Mesopolobus tibialis*** (Westwood, 1833)*

Distribution in Morocco. Haouta el Kasdir, l850 m, 15 km southeast of Chauen, in the Jebala, 1 ♂, 4. and 11.VII.1960 (Delucchi, 1962b: 16-17).

Insect hosts. Diptera: Cecidomyiidae (Herting, 1978); Hymenoptera: Cynipidae (Bouček, 1977; Mitroiu, 2001; Gómez *et al.*, 2006; Askew *et al.*, 2013; Lepidoptera: Tortricidae (Thompson, 1958; Askew, 1961).

General distribution. Palaearctic Region.

***Mesopolobus xanthocerus*** (Thomson, 1878)*

Distribution in Morocco. Haouta el Kasdir, l850 m, 15 km southeast of Chauen, in Jebala, 4. and 11.VII.1961, Oued Yquem (between Rabat and Casablanca), a few kilometers from its mouth, 4.VII. 1960 (Delucchi, 1962b: 17).

Insect hosts. Hymenoptera: Cynipidae (Garrido Torres & Nieves-Aldrey, 1999; Gómez *et al.*, 2006; Askew *et al.*, 2013), Eulophidae (Askew, 1961).

General distribution. Palaearctic Region.

**Genus *Metacolus*** Förster, 1856*

***Metacolus unifasciatus*** Förster, 1856*

Distribution in Morocco. Bir Charef, 24.IV.1992, P. Graf leg. (CIRAD) (Delvare, com. pers., 2019).

Insect hosts. Coleoptera: Cerambycidae (Mendel, 1986), Curculionidae (Bouček, 1957; Graham, 1969; Herting, 1973; Dzhanokmen, 1978; Fry, 1989; Paanzavolta & Tiberi, 2010; Ghahari & Huang, 2012). In Morocco, this species was reared on *Pityogenes* sp. (Coleoptera: Curculionidae: Scolytinae) (Delvare, com. pers., 2019).

General distribution. India, Afrotropical and Palaearctic Regions.

Genus ***Muscidifurax*** Girault & Sanders, 1910

***Muscidifurax raptor*** Girault & Sanders, 1910

Distribution in Morocco. Essaouira, 1 ♀, VI.1983 (Vago, 2002: 97).

Insect hosts. Diptera: Anthomyiidae (Dzhanokmen, 1978), Calliphoridae (Burks, 1979; Peck, 1963), Muscidae (Graham, 1969; Herting, 1978), Sarcophagidae (Turner *et al.*, 1968), Sepsidae (Marchiori *et al.*, 2000), Syrphidae (Fry, 1989), Tephritidae (Podoler & Mendel, 1977).

General distribution. Australian, Afrotropical, Nearctic, Neotropical and Palaearctic Regions.

Genus ***Nasonia*** Ashmead, 1904*

***Nasonia vitripennis*** (Walker, 1836)*

Distribution in Morocco. Fir forest of Talassemtane National Park, Y. Benyahia leg. (Benyahia, 2016: 168).

Insect hosts. Coleoptera: Curculionidae (Pettersen, 1976), Tenebrionidae; Dermaptera: Carcinophoridae; Dictyoptera: Blattellidae, Blattidae (Rivers *et al.*, 1993); Diptera: Anthomyiidae (Turchetto *et al.*, 2003), Calliphoridae (Peck, 1963; Askew, 1971), Glossinidae (Thompson, 1958), Hippoboscidae (De Santis, 1967), Muscidae (Burks, 1979; Bouček, 1988; Fry, 1989; Marchiori *et al.*, 2013), Oestridae, Piophilidae (Burks, 1979), Sarcophagidae (Rivers & Denlinger, 1995; Oakeshott *et al.*, 2010), Sciomyzidae (Thompson, 1958), Syrphidae (Turchetto *et al.*, 2003), Tachinidae (Vidal, 1997); Hemiptera: Aphididae, Lygaeidae; Hymenoptera: Apidae (Rivers *et al.*, 1993), Diprionidae (Herting, 1977), Vespidae (OILB, 1971); Isoptera: Rhinotermitidae; Lepidoptera: Erebidae, Noctuidae (Rivers *et al.*, 1993), Lasiocampidae (Öncüer, 1991), Pyralidae (Thompson, 1958), Tortricidae (Herting, 1975); Orthoptera: Phasmatidae (Rivers *et al.*, 1993).

General distribution. Australasia, Indo-Malay, Afrotropical, Nearctic, Palaearctic and Neotropical Regions.

Genus ***Norbanus*** Walker, 1843

***Norbanus cerasiops*** (Masi, 1922)

Distribution in Morocco. Doukkala, Haouz, Moulouya, Gharb, Kénitra, Tadla, Loukkos, Tangier, Tetouan (Brémond, 1938:

8); Skhirate, 1 ♀, 3.VII.1961 (Delucchi, 1962b: 18); Rabat, 2 ♀♀, 4 ♂♂, VII.1936 (Rizzo & Mitroiu, 2010: 238-239).

Insect hosts. Coleoptera: Curculionidae (Herting, 1973; Bouček, 1977; Öncüer, 1991; Hasani *et al.*, 2011). The species is known in Morocco as an ectophagous parasite of larvae of *Lixus juncii* Boheman, 1838, *L. scabricolllis* Boheman, 1842 and *L. brevirostris* Boheman, 1835 (Coleoptera: Curculionidae) (Brémond, 1938; Delucchi, 1962b).

General distribution. Palaearctic Region.

Genus ***Notoglyptus*** Masi, 1917

***Notoglyptus scutellaris*** (Dodd & Girault, 1915)

Distribution in Morocco. Surroundings of Rabat, 6 ♂♂, 1 ♀, 12.II.1961, 29.II.1961, from 14. to 20.VI.1961 (Delucchi, 1962a: 17)

Insect hosts. Unknown.

General distribution. Australian, Indo-Malay, Afrotropical, Palaearctic Region, and Canada.

Genus ***Novitzkyanus*** Bouček, 1961

***Novitzkyanus cryptogaster*** Bouček, 1961

Material examined. Maâmora Forest, canton A, Sidi Taïbi commune, Taïcha, 1 ♀, 03.VII.2012; 1 ♀, 26.VI.2013; 1 ♂, 26.III.2013; 1 ♂, 12.IX.2012, K. Kissayi leg.

Distribution in Morocco. Along the road that leads from Rabat to Sale aerodrome, ♀ Type unique, 26.VI.1960 (Delucchi, 1962a: 119); garden of Agronomic Research of Rabat, allotype and paratype (ETHZ), 2 ♂♂, 1 ♀, between 13-20.VI.1961 (Delucchi, 1962b: 17).

Insect hosts. Diptera: Sarcophagidae (Baker *et al.*, 2000) and Mollusca: Helicidae (Coupland & Baker, 1994).

General distribution. Palaearctic Region.

Genus ***Oxysychus*** Delucchi, 1956

***Oxysychus regnieri*** (Masi, 1934)

Distribution in Morocco. Oasis of Tazzougert, 26.V.1933; 6.V.II.1933 (Jourdan & Rungs, 1934: 211); Tarzougeurt Moroccan Sahara, ♀, Regnier leg. (Masi, 1934: 98).

Insect hosts. Coleoptera: Cerambycidae, Curculionidae (Graham, 1969).

General distribution. Endemic species of Morocco.

Genus ***Pachycrepoideus*** Ashmead, 1904

***Pachycrepoideus vindemmiae*** (Rondani, 1875)

Distribution in Morocco. Fez, 21.X.1935 (Rungs, 1936: 19); same locality, VIII.1938 (Bléton & Fieuzet, 1939: 61); Rabat, 1 ♀, 30.X.1928, J. Mimeur leg., MCHN (Graham, 1969: 847); Rabat region; Gharb; Zemmour; Berkane; Oujda; Nador; Figuig; Casablanca; Mohammedia; Bouznika; Benslimane; Azemmour; El Jadida; Settat; Berrechid; Marrakech; Safi; Essaouira; Souss Valley; Agadir; Biougra; Larache; Tangier; Ouazzane; Al Hoceïma; Béni Mellal; Khouribga; Khénifra; Tadla; Demnate; Azilal (De Lépiney & Mimeur, 1932: 106).

Insect hosts. Diptera: Anthomyiidae (Dzhanokmen, 1978), Calliphoridae (Burks, 1979; Graham, 1969; Marchiori *et al.*, 2012), Cecidomyiidae (Farooqi & Subba Rao, 1986), Drosophilidae (Bouček, 1961), Lonchaeidae (Thompson, 1958), Muscidae (Herting, 1978), Phoridae (Reina & Vasta, 2003), Piophilidae (Bouček, 1961; Peck, 1963), Sarcophagidae (Marchiori *et al.*, 2003), Sphaeroceridae (Marchiori *et al.*, 2002), Stratiomyiidae (Pickens *et al.*, 1975), Syrphidae (Marchiori *et al.*, 2012), Tephritidae (De Santis & Fidalgo, 1994); Hemiptera: Coreidae (Herting, 1978); Hymenoptera: Apidae (Mitroiu, 2001); Lepidoptera: Bombycidae (Kumar *et al.*, 1989), Pyralidae (Öncüer, 1991). In Morocco, this species was obtained from breeding the fruit fly *Ceratitis capitata* (Wiedemann, 1824) (Diptera: Tephritidae) and also parasitizes the fruit flies which accompany *Ceratitis* (De Lépiney & Mimeur, 1932; Rungs, 1936; Bléton & Fieuzet, 1939). It has been observed on *Drosophila repleta* Wollaston, 1858 (Diptera: Drosophilidae) having many plant hosts figs, apricots, nectarines, peaches, apples, pears, grapes, melons, olives etc.; as well as on *D. melanogaster* Meigen, 1830 (= *D. ampelophila* Löw, 1862) and *Ceratitis capitata* where the larvae live as endoparasites of *Drosophila* larvae and the adults hatch from the host's pupae (De Lépiney & Mimeur, 1932).

General distribution. Australian, Neotropical, Nearctic and Palaearctic Regions.

Genus ***Pachyneuron*** Walker, 1833

***Pachyneuron aphidis*** (Bouché, 1834)

Distribution in Morocco. Soualem Trifia (Atlantic coast between Casablanca and Azemmour), 2 ♀♀, 5.VI.1960; around Rabat, 2 ♀♀, 12.V.1961, Sidi Slimane, 1 ♀, 18.IV.1961 (Delucchi, 1962a: 123); Rabat, 3 ♀♀, 8.VIII.1993 (Vago, 2002: 97); Fir forest of Talassemtane National Park, Y. Benyahia leg. (Benyahia, 2016: 168).

Insect hosts. Coleoptera: Coccinellidae (Thompson, 1958); Diptera: Agromyzidae (OILB, 1971), Cecidomyiidae (Fry, 1989), Syrphidae (Peck, 1963); Hemiptera: Aphididae (De Santis, 1979; Farooqi & Subba Rao, 1986; Gibson, 2001; Mitroiu & Andriescu, 2003), Coccidae (Peck, 1963), Kermesidae (Thompson, 1958), Pseudococcidae (Herting, 1972), Psyllidae (Talitsky, 1966); Hymenoptera: Cynipidae (Fry, 1989; Askew *et al.*, 2001); Lepidoptera: Gelechiidae (Xiao *et al.*, 2009), Tortricidae (Gibson, 2001).

General distribution. Australian, Indo-Malay, Afrotropical, Neotropical, Nearctic and Palaearctic Regions.

***Pachyneuron coccorum*** (Linnaeus, 1758)

Distribution in Morocco. Casablanca, XI.1935 (Rungs, 1936: 19); Larache; Kénitra; Rabat; Salé; Casablanca; El Jadida; Essaouira (Smirnoff, 1956: 52).

Insect hosts. Coleoptera: Coccinellidae (Herting, 1973); Diptera: Chamaemyiidae (Thompson, 1958), Cryptochetidae (Herting, 1978); Hemiptera: Adelgidae (Herting, 1972), Aphididae (Radev, 1968), Coccidae (Herting, 1977), Diaspididae, Eriococcidae, Kermesidae, Margarodidae, Pseudococcidae, Psyllidae (Herting, 1972); Hymenoptera: Encyrtidae (Zinna, 1960). In Morocco, this species was obtained in a rearing of *Planococcus citri* Risso, 1813 (= *Pseudococcus citri* Risso, 1813) (Hemiptera: Pseudococcidae) in company with *Anagyrus bohemani* (Westwood, 1837) (Chalcidoidea: Encyrtidae) of which it would be a predator (Rungs, 1936). In addition, it has been observed to reduce the activity

of *Chilocorus bipustulatus* Linnaeus, 1758 (Coleoptera: Coccinellidae) (Smirnoff, 1956).

General distribution. Palaearctic Region.

***Pachyneuron formosum*** Walker, 1833

Distribution in Morocco. Rabat, 3 ♀♀, IV.1993 (Vago, 2002: 97); Fir forest of Talassemtane National Park, Y. Benyahia leg. (Benyahia, 2016: 168).

Insect hosts. Diptera: Syrphidae (Thompson, 1958; Graham, 1969; Dzhanokmen, 1978; Garrido Torres & Nieves-Aldrey, 1999); Hemiptera: Aphididae (Öncüer, 1991), Pseudococcidae (OILB, 1971); Lepidoptera: Lasiocampidae, Pieridae (Xiao *et al.*, 2009).

General distribution. Palaearctic Region.

***Pachyneuron groenlandicum*** (Holmgren, 1872)*

Distribution in Morocco. Fir forest of Talassemtane National Park (Benyahia, 2016: 168).

Insect hosts. Diptera: Chloropidae (Graham, 1969), Psilidae (OILB, 1971), Syrphidae (Kamijo, 1983); Hemiptera: Aphididae, Coccidae (Kamijo & Takada, 1973); Lepidoptera: Lasiocampidae, Pieridae (Xiao *et al.*, 2009), Noctuidae (Vidal, 1993); Neuroptera: Hemerobiidae (Gupta & Poorani, 2008).

General distribution. Palaearctic Region and Yemen.

***Pachyneuron muscarum*** (Linnaeus, 1758)*

Material examined. Rabat, 3 ♀♀, 27.VII.1949, W. Smirnoff leg., Ghesquière det. (RBINS, Brussels, Belgium) (pers. obs., 2018).

Insect hosts. Coleoptera: Coccinellidae (Graham, 1969), Curculionidae (Büchi, 1993); Diptera: Agromyzidae (Thompson, 1958), Cecidomyiidae (OILB, 1971), Chloropidae (Garrido Torres & Nieves-Aldrey, 1999); Hemiptera: Aphididae (Öncüer, 1991), Coccidae, Diaspididae (Mendel *et al.*, 1984), Eriococcidae (Viggiani, 1990; Andriescu & Mitroiu, 2004), Kermesidae (OILB, 1971), Pseudococcidae (Baur, 2005), Psyllidae (Olszak & Jaworska, 2003); Hymenoptera: Pamphiliidae (Koehler, 1967); Lepidoptera: Lasiocampidae (Benedek, 1969), Tortricidae (Thompson, 1958), Yponomeutidae (Huang *et al.*, 2012). In Morocco, according to labels on the specimens placed at RBINS, Belgium, this species was obtained on the larvae of *Chilocorus bipustulatus* (Coleoptera: Coccinelledae) (pers. obs., 2018).

General distribution. Palaearctic Region.

**Genus *Peridesmia*** Förster, 1856

***Peridesmia discus*** (Walker, 1835)

Distribution in Morocco. 10 km from Kénitra (bifurcation of Tangier Road and Sidi Kacem), 1 ♂, 31.I.1962 (Delucchi, 1962b: 18).

Insect hosts. Coleoptera: Curculionidae (Burks, 1979; Bouček, 1977; Mitroiu, 2007).

General distribution. United States of America and Palaearctic Region.

Genus ***Plutothrix*** Förster, 1856*

***Plutothrix* sp.***

Distribution in Morocco. Mamora (Oued Tiflet), 11.XI.1933, cited as *Trigonoderus* sp., near *T. acuminatus* (Thomson, 1878) (Jourdan & Rungs, 1934: 213).

Insect hosts. In Morocco, this specimen was collected by rearing larvae of *Scardia boletella* (Fabricius, 1794) (= *Scardia boleti* Fabricius, 1798) (Lepidoptera: Tineidae) living on the polypore of *Inonotus tamaricis* (Pat.) Maire (= *Xanthochrous tamariscis* Pat.) (Hymenochaetaceae) (Jourdan & Rungs, 1934).

Genus ***Pseudocatolaccus*** Masi, 1908

***Pseudocatolaccus nitescens*** (Walker, 1834)

Distribution in Morocco. A few kilometers from the mouth of Oued Cherrat, 1 ♀, 7.IV.1961; Haouta el Kasdir, 1850 m, 15 km south-east of Chauen, Jebala, 1 ♀, between 4. and 11.VII.1961 (Delucchi, 1962b: 18); Rabat, 1 ♀, 27.XII.1992 (Vago, 2002: 97).

Insect hosts. Coleoptera: Bruchidae, Curculionidae (Herting, 1973); Diptera: Cecidomyiidae (Graham, 1969; Garrido Torres & Nieves-Aldrey, 1992; Askew *et al.*, 2001; Vago, 2006).

General distribution. Palaearctic Region.

Genus ***Pteromalus*** Swederus, 1795

***Pteromalus bifoveolatus*** Förster, 1861

Distribution in Morocco. Rabat, syntypes, 3 ♀♀, 3 ♂♂, MCHN (Graham, 1969: 490).

Insect hosts. Lepidoptera: Erebidae (Bouček, 1966, 1977), Lasiocampidae (Garrido Torres & Nieves-Aldrey, 1999), Notodontidae (Thompson, 1958), Saturniidae (Öncüer, 1991; Graham, 1969; Dzhanokmen, 1978).

General distribution. Palaearctic Region.

***Pteromalus chrysos*** Walker, 1836

Distribution in Morocco. Maâmora (Villemant & Fraval, 1993: 94); same locality; Zaër Forest (De Lépiney & Mimeur, 1932: 56); Maamora forest; Machraâ El Kettane; Bled Dendoun (De Lépiney, 1927: 161); Aïn Kahla; Azrou; Ras-Al-Ma (Mouna, 2013: 9).

Insect hosts. Coleoptera: Chrysomelidae (Haeselbarth, 1989); Diptera: Tephritidae (Thompson, 1958); Hymenoptera: Diprionidae (Herting, 1977), Tenthredinidae (Haeselbarth, 1983); Lepidoptera: Arctiidae, Gracillariidae (Vidal, 1997), Erebidae (Bouček, 1977), Gelechiidae (Vidal, 1993), Geometridae (Haeselbarth, 1985), Notodontidae (Graham, 1969), Pieridae (Herting, 1976, 1977), Tortricidae (Herting, 1975), Yponomeutidae (OILB, 1971). This species was obtained in Morocco as part of the parasitoid complex of *Lymantria dispar* (Lepidoptera: Erebidae: Lymantriinae) (De Lépiney, 1927; Villemant & Fraval, 1993). Also, it was obtained as a secondary parasitoid of *Acleris undulana* and *Dichelia numidicola* Chambon, 1990 (Lepidoptera: Tortricidae) and *Thaumetopoea pityocampa* (Lepidoptera: Notodontidae) (Mouna, 2013).

General distribution. Palaearctic Region.

***Pteromalus delvarei*** Vago, 2002

Distribution in Morocco. Road Ouarzazate-Errachidia, 30 km W Goulmima, holotype ♀, 28.V.1992; road Ouarzazate-

Errachidia, 30 km W Goulmima, allotype ♂, 28.V.1992, Road Ouarzazate-Errachidia, 30 km W Goulmima, paratypes 6 ♀♀, 28.V.1992; Ouarzazate-Errachidia Road, 31 km E Goulmima, 4 ♀♀, 28.V.1992; Ouarzazate-Errachidia Road, 31 km E Goulmima, 2 ♂♂, 28.V.1992 (Vago, 2002: 102).

Insect hosts. Unknown.

General distribution. Endemic species of Morocco.

***Pteromalus lixi*** (Sarra, 1924)

Distribution in Morocco. Doukkala, Haouz, Moulouya, Gharb, Kénitra, Tadla Loukkos, Tangier, Tetouan (Brémond, 1938: 8).

Insect hosts. Coleoptera: Cerambycidae (Bin, 1973), Curculionidae (Herting, 1973; Isart, 1970). In Morocco, this species has been observed to contribute to the reduction of *Lixus juncii* (Coleoptera: Curculionidae) attacking sugar beet *Beta vulgaris* Linnaeus, 1753 (Chenopodiaceae) (Brémond, 1938).

General distribution. Palaearctic Region (Spain, Italy and Morocco).

***Pteromalus platyphilus*** Walker, 1874*

Distribution in Morocco. Morocco, 1 ♀ (NMBE) (Baur 2527), Z. Bouček det. in 1996 (Baur, 2015: 57).

Insect hosts. Hemiptera: Aphididae (Öncüer, 1991) and Araneae: Dictynidae (Bouček, 1977; Askew *et al.*, 2001; Dzhanokmen, 2001).

General distribution. Palaearctic Region.

***Pteromalus puparum*** (Linnaeus, 1758)*

Distribution in Morocco. Taroudant region; south of Agadir; Oued Souss (Stefanescu *et al.*, 2011: 20, 24); Tadla; Béni Moussa; Béni Amer; Demnat; Azilal; Nador; Oujda; Figuig (Le Gall, 1961: 88, 93; De Lépiney & Mimeur, 1932: 61); Meknes; Azrou; Marrakech; Marrakech: high valley of the Reraia; Imintanout; Safi; Essaouira; Rabat; Maâmora forest; Tangier; Errachidia; Erfoud; Midelt; Rissani (De Lépiney & Mimeur, 1932: 61, 68; Jourdan & Rungs, 1934: 213); Douïet, 14.VI.2001, S. Amazouz leg. (CIRAD) (Delvare, com. pers., 2019).

Insect hosts. Coleoptera: Bruchidae (Herting, 1973), Curculionidae (Gibson *et al.*, 2006); Diptera: Chloropidae (Thompson, 1958); Hemiptera, Diaspididae (OILB, 1971); Hymenoptera: Braconidae (Askew & Shaw, 1997), Cynipidae (Tudor & Căruntu, 1980), Sphecidae, Vespidae (Peck, 1963); Lepidoptera: Arctiidae (Gospodinov, 1963), Coleophoridae (Peck, 1963), Erebidae, Geometridae, Hesperiidae, Lasiocampidae (Burks, 1979), Lycaenidae (Ahmed, 1995), Noctuidae (Herting, 1976; Vidal, 1993), Notodontidae (Thompson, 1958), Nymphalidae (Garrido Torres & Nieves-Aldrey, 1999; Mitroiu, 2001), Papilionidae (Graham, 1969), Pieridae (Bouček, 1961; Herting, 1976), Psychidae (Burks, 1979), Saturniidae (Herting, 1976), Tortricidae (Herting, 1975), Yponomeutidae (Ru & Workman, 1979), Zygaenidae (Askew, 1970; Askew & Shaw, 1997). In Morocco, this species was obtained on *Cotesia glomerata* (Linnaeus, 1758) (Hymenoptera: Braconidae) parasitising *Pieris brassicae* (Linnaeus, 1758) (Lepidoptera: Pieridae) feeding on *Brassica oleracea* Linnaeus, 1753 (Brassicaceae) (Delvare, com. pers., 2019).

General distribution. Australian, Indo-Malay, Afrotropical, Nearctic, Neotropical and Palaearctic Regions.

***Pteromalus ridens*** Vago, 2002

Distribution in Morocco. Rabat, ♀ Holotype, 26.XII.1992, ♂ Allotype, 26.XII.1992, 2 ♂ Paratype, 26.XII.1992 (Vago, 2002: 100).

Hosts. Unknown.

General distribution. Endemic species of Morocco.

***Pteromalus semotus*** (Walker, 1834)*

Distribution in Morocco. Province of Tata: Tichekji, 29°54′36″N 8°31′48″W; Region of Souss-Massa: Sidi Moulay Cherif, 30°39′36″N 6°33′36″W; Taroudant, 30°29′24″N 8°51′32″W (Stefanescu *et al.*, 2012: 91).

Insect hosts. Coleoptera: Anobiidae (Herting, 1973), Apionidae (Graham, 1969), Chrysomelidae (Miczulski, 1994), Curculionidae (Öncüer, 1991); Hymenoptera: Diprionidae (Graham, 1969); Lepidoptera: Coleophoridae (Bouček, 1988), Erebidae (Herting, 1976), Gelechiidae (Vidal, 1993; Askew *et al.*, 2001), Geometridae (Haeselbarth, 1985), Gracillariidae (Gorksa-Drabik & Napiorkowlik-Kowalik, 2009), Lyonetiidae (Haeselbarth, 1989), Noctuidae (Kamijo, 1982), Notodontidae, Pieridae (Thompson, 1958; Herting, 1976, 1977), Tischeriidae (Gorksa-Drabik & Napiorkowlik-Kowalik, 2009), Tortricidae (Graham, 1991), Yponomeutidae (OILB, 1971; Baur, 2005), Zygaenidae (Graham, 1969). In Morocco, this species was obtained as secondary parasitoids of painted lady butterfly, *Vanessa cardui* (Linnaeus, 1758) (Lepidoptera: Nymphalidae) (Stefanescu *et al.*, 2012).

General distribution. India, Mexico, New Zealand and Palaearctic Region.

***Pteromalus vibulenus*** (Walker, 1839)*

Distribution in Morocco. Aïn Kahla, Azrou, Ras El Ma (Mouna, 2013: 9, 76).

Insect hosts. Coleoptera: Chrysomelidae (Haeselbarth, 1989), Curculionidae (Vidal, 1993); Hymenoptera: Cynipidae (Askew *et al.*, 2006); Lepidoptera: Gelechiidae (Vidal, 1993), Pieridae (Garrido Torres & Nieves-Aldrey, 1999), Pyralidae, Tortricidae, Zygaenidae (Graham, 1969). In Morocco, this species has been reported as a parasitoid of caterpillars and pupae of *Acleris undulana* (Lepidoptera: Tortricidae) (Mouna, 2013).

General distribution. Palaearctic Region.

Genus ***Rhaphitelus*** Walker, 1834*

***Rhaphitelus maculatus*** Walker, 1834*

Distribution in Morocco. Rabat, 20.IV.1935, Brémond leg. (Rungs, 1936: 19); Tafrouat region: Douar Aguer-Oudad; Tasserirt, 1981 (Benazoun, 1988: 96).

Insect hosts. Coleoptera: Curculionidae (Peck, 1963; Herting, 1973); Lepidoptera: Cossidae (Tawfik & Ramadan, 2006). In Morocco, this species was obtained from *Scolytus amygdali* (Coleoptera: Curculionidae: Scolytinae) (Benazzoun, 1988). Also, this species was noted as a parasite of *Scolytus rugulosus* (Müller, 1818) (= *Eccoptogaster rugulosus* Ratzeburg, 1837

(Coleoptera: Curculionidae: Scolytinae) whose larvae feed in peach wood (Rungs, 1936).

General distribution. Australian, Indo-Malay, Nearctic, Neotropical and Palaearctic Regions.

Genus ***Roptrocerus*** Ratzeburg, 1848*

***Roptrocerus* aff. *brevicornis*** Thomson, 1878*

Distribution in Morocco. Bir Charef, 24.IV.1991, P. Graf leg. (CIRAD) (Delvare, com. pers., 2019).

Insect hosts. Coleoptera: Curculionidae (Herting, 1972, Bouček, 1977, Vidal, 1993). In Morocco, this species was reared on *Pityogenes* sp. (Coleoptera: Curculionidae: Scolytinae) (Delvare, com. pers., 2019).

General distribution. Palaearctic Region.

***Roptrocerus xylophagorum*** (Ratzeburg, 1844)*

Distribution in Morocco. Oued Cherrate, 13.IX.1991, D. Ghaioule leg. (CIRAD) (Delvare, com. pers., 2019).

Insect hosts. Coleoptera: Curculionidae (Herting, 1972; Grissell, 1979; Kamijo, 1981; Mendel, 1986; Fry, 1989; Hougardy & Gregoire, 2001). In Morocco, this species was reared on Scolytinae (Coleoptera: Curculionidae) (Delvare, com. pers., 2019).

General distribution. Australia, India, Neotropical and Palaearctic Regions.

Genus ***Sedma*** Bouček, 1991

***Sedma dispar*** Bouček, 1991

Distribution in Morocco. Rabat, ♂, 17.VII.1991, J.L. Vago leg. (Vago, 2002: 98).

Insect hosts. Unknown.

General distribution. Palaearctic Region (France, Greece, Spain and Morocco).

Genus ***Sphegigaster*** Spinola, 1811

***Sphegigaster* aff. *cuscutae*** Ferrière, 1959*

Distribution in Morocco. Region of Fez, region of Meknes, many individuals ♀ and ♂ (Klein, 1995, abstract only).

Remarks. The specimens have affinities with *Sphegigaster cuscutae* Ferrière with some differences. This is probably a new species for science according to Dr. O. Klein and was obtained as a parasitoid on *Orobanche crenata* Forsskål, *O. aegyptiaca* Persoon and *O. foetida* (Poiret) (Orobanchaceae) (Klein, 1995).

***Sphegigaster stepicola*** Bouček, 1965

Distribution in Morocco. Rabat, ♀, 17.VII.1991 (Vago, 2002: 99).

Insect hosts. Diptera: Agromyzidae (Graham, 1969; Farooqi & Subba Rao, 1986; Andriescu & Mitroiu, 2001; Ghahari & Huang, 2012).

General distribution. Ethiopia, India and Palaearctic Region.

Genus ***Stenomalina*** Ghesquière, 1946

***Stenomalina gracilis*** (Walker, 1834)

Distribution in Morocco. Rabat, ♀, 11.VIII.1983 (Vago, 2002: 99).

Insect hosts. Coleoptera: Curculionidae (Gibson *et al.*, 2006); Diptera: Agromyzidae (Vidal, 1993; Askew *et al.*, 2001), Calliphoridae (Herting, 1978), Cecidomyiidae (Ghahari *et al.*, 2010), Chloropidae (Dzhanokmen, 1978), Tephritidae (Vidal, 1997); Hymenoptera: Cynipidae (Mitroiu, 2001); Lepidoptera: Tortricidae (Herting, 1975).

General distribution. Canada and Palaearctic Region.

Genus ***Stenoselma*** Delucchi, 1956

***Stenoselma nigrum*** Delucchi, 1956

Distribution in Morocco. Coastal and sub costal region between Rabat and Casablanca, many individuals ♂ and ♀: Bouznika, VI.1960, 5.IV.1961; Sidi Bettache, 21.II.1961; Oued Cherrat, 17.IV.1961; Rabat, 29.III.1961 (Delucchi, 1962: 122); Rabat, 2 ♀, 22.IV.1992; ♀, 27.VII.1993; ♀, 29.IV.1992; ♂, 21.XII.1992; ♀, 26.XII.1992; Skhirate, ♀, 26.VII.1991 (Vago, 2002: 99).

Insect hosts. Coleoptera: Buprestidae (Askew *et al.*, 2001); Hymenoptera: Cynipidae (Vidal, 1993); Lepidoptera: Sesiidae (Garrido Torres & Nieves-Aldrey, 1999).

General distribution. Palaearctic Region.

Genus ***Stinoplus*** Thomson, 1878

***Stinoplus etearchus*** (Walker, 1848)

Distribution in Morocco. Rabat, ♂, 29.IV.1992 (Vago, 2002: 99).

Insect hosts. Hymenoptera: Cynipidae (Dzhanokmen, 1978; Askew *et al.*, 2006).

General distribution. Australia, New Zealand, and Palaearctic Region.

Genus ***Syntomopus*** Walker, 1833*

***Syntomopus thoracicus*** Walker, 1833*

Distribution in Morocco. North-west plain of Gharb: Lalla Mimouna (between Souk el Arba of Gharb and El Ksar el Kbir, 1 ♀, 15.II.1961 (Delucchi, 1962a: 122).

Insect hosts. Diptera: Agromyzidae (Graham, 1969; Andriescu & Mitroiu, 2001).

General distribution. Palaearctic Region.

Genus ***Toxeumorpha*** Girault, 1915

***Toxeumorpha nigricola*** Ferrière, 1936

Distribution in Morocco. Morocco (Bouček & Rasplus, 1991: 48).

Insect hosts. Lepidoptera: Lyonetiidae (Thompson, 1958), Tortricidae (Bouček, 1976).

General distribution. Afrotropical Region, Canary Islands, Madeira and Morocco.

Genus ***Trichomalopsis*** Crawford, 1913

***Trichomalopsis hemiptera*** (Walker, 1835)

Distribution in Morocco. Morocco (Herting, 1975: 178)

Insect hosts. Diptera: Anthomyiidae (Bouček, 1961), Cecidomyiidae (Graham, 1969), Chloropidae (Legner *et al.*,

1966); Hymenoptera: Cynipidae (Herting, 1977); Lepidoptera: Arctiidae (Herting, 1978), Erebidae (Peck, 1963), Noctuidae, Pieridae (Herting, 1976), Pyralidae, Yponomeutidae (Herting, 1975).

General distribution. New Zealand, Nearctic, Neotropical, and Palearctic Region.

***Trichomalopsis microptera*** (Lindeman, 1887)

Distribution in Morocco. Morocco (Herting, 1978: 24-25).

Insect hosts. Coleoptera: Chrysomelidae (Haeselbarth, 1989); Diptera: Cecidomyiidae (Dzhanokmen, 1978), Chloropidae (Thompson, 1958).

General distribution. United States of America and Palaearctic Region.

Genus ***Trichomalus*** Thomson, 1878

***Trichomalus bracteatus*** (Walker, 1935)*

Distribution in Morocco. Haouta el Kasdir, 1 850 m, in Jebala, 15 km SE of Chauen, 1 ♀, between 4 and 11.VII.1961 (Delucchi, 1962b: 18).

Insect hosts. Coleoptera: Curculionidae (Thompson, 1958); Hymenoptera: Cynipidae (Herting, 1977; Nieves-Aldrey *et al.*, 2007).

General distribution. Palaearctic Region.

***Trichomalus campestris*** (Walker, 1834)*

Distribution in Morocco. Haouta el Kasdir, 1 850 m, in Jebala, 15 km S of Chauen, 30 ♂ and ♀, between 4. and 11.VII.1961 (Delucchi, 1962b: 18).

Insect hosts. Coleoptera: Apionidae (OILB, 1971; Askew *et al.*, 2001), Curculionidae (Müller *et al.*, 2007).

General distribution. Palaearctic Region.

***Trichomalus gynetelus*** (Walker, 1935)*

Distribution in Morocco. Haouta el Kasdir 1 850 m, 15 km south-east of Chauen in Jebala, 1 ♀, between 4. and 11.VII.1961 (Delucchi, 1962b: 19).

Insect hosts. Coleoptera: Apionidae (Askew *et al.*, 2001), Curculionidae (Müller *et al.*, 2007).

General distribution. Palaearctic Region.

***Trichomalus sufflatus*** Delucchi, 1962

Distribution in Morocco. Gharb, Tangier Road between Kénitra and Souk el Tleta; ♀, 6.IV.1961; Haouta el Kasdir 1 850 m, 15 km south-east of Chauen in Jebala, ♀ paratype, 4.-11. VII.1961; Holotype and 4 Paratypes in Delucchi's collection (Delucchi, 1962b: 19).

Insect hosts. Unknown.

General distribution. Endemic to Morocco.

## Discussion

In Morocco, Pteromalidae is the most diverse family of Chalcidoidea with 117 binomial species divided into 71 genera placed in 11 subfamilies: Asaphinae (2 genera /3 species), Cerocephalinae (2 genera /2 species), Cleonyminae (4 genera /6 species), Eunotinae (2 genera /4 species), Macromesinae (1 genus/1 species), Miscogastrinae (5 genera /5 species), Ormocerinae (1 genus/1 species), Pireninae (2 genera/ 1 species), Spalangiinae (1 genus/7 species), Sycoryctinae (1 genus /1 species) (Part I) and the most diverse Pteromalinae (50 genera /86 species) (Fig. 1). Of these 10 species are endemic to Morocco.

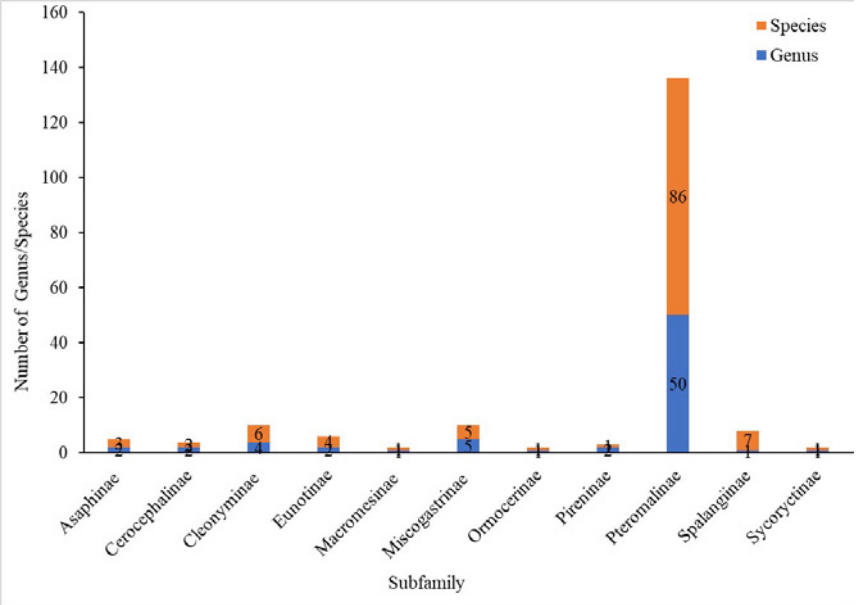


Fig. 1.— Genera and species diversity of each subfamily of Pteromalidae in Morocco.

Fig. 1.— Diversidad de géneros y especies de las subfamilias de Pteromalidae en Marruecos.

Among the Pteromalinae fauna, 9 species were collected and identified for the first time in Morocco: *Cratomus megacephalus* (Fabricius, 1793), *Dinarmoides spilopterus* Masi, 1924, *Dinarmus basalis* (Rondani, 1877), *Homoporus fulviventris* (Walker, 1835), *Mesopopobus amaenus* Walker, 1834, *Mesopolobus gemellus* Baur and Muller, 2007, *Mesopolobus nobilis* (Walker, 1834), *Nasonia vitripennis* Walker, 1836 and *Pachyneuron groenlandicum* (Holmgren, 1872); and 4 previously unreported species were found to be deposited in various natural history museums: *Metacolus unifasciatus* Förster, 1856, *Pachyneuron muscarum* (Linnaeus, 1758), *Roptrocerus* aff. *brevicornis* Thomson, *Roptrocerus xylophagorum* (Ratzeburg, 1844).

However, by comparison with the catalogue of Noyes (2020), the entomofauna of Pteromalidae has been increased for Morocco by 1 subfamily, 19 genera and 29 species that we found in bibliography but have never been catalogued as Moroccan chalcids. In addition, we have identified at least 2 species that are probably new for science: *Erythromalus* sp., and *Gastrancistrus* aff. *vagans* Westwood, 1833. If confirmed, their descriptions will be published in a later paper. However, a list composed of all the genera and species recorded in Morocco so far are presented in the Appendix.

Knowing that Morocco is one of the world's hotspots (Secretary of State for the Environment Morocco, 2009), despite the fact that entomological studies are rare, this research is of considerable importance in providing information that helps researchers discover, maintain and act to protect the country's biodiversity and environment. These insects play an important role in the biological control of serious agricultural and forest pests and many of them are employed successfully in biological control programs all over the world (Bouček & Rasplus, 1991; Sureshan & Narendran, 2003). For this reason, determining the species diversity in different regions of Morocco and their conservation are necessary. In this sense the present research has been carried out and should serve as a pilot study that could be extended to other parts of the kingdom.

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Appendix.— List of all genera and species of Pteromalidae present in Morocco (*: found in literature and in museums visited but never previously cataloged; **: newly identified).

Apéndice.— Lista de los géneros y especies de Pteromalidae presentes en Marruecos (*: citas bibliográficas y ejemplares de museos visitados pero nunca antes catalogados; **: recién identificados).

Subfamily **Asaphinae** Ashmead, 1904
Genus ***Asaphes*** Walker, 1834
*Asaphes suspensus* (Nees, 1834)
*Asaphes vulgaris* Walker, 1834
Genus ***Hyperimerus*** Girault, 1917*
*Hyperimerus pusillus* Walker, 1833*

Subfamily **Cerocephalinae** Gahan, 1946
Genus ***Cerocephala*** Westwood, 1832*
*Cerocephala eccoptogastri* Masi, 1921*
Genus ***Theocolax*** Westwood, 1832
*Theocolax elegans* (Westwood, 1874)

Subfamily **Cleonyminae** Walker, 1837
Genus ***Cleonymus*** Latreille, 1809
*Cleonymus laticornis* Walker, 1837
*Cleonymus longigaster* Mitroiu, 2019**
Genus ***Heydenia*** Förster, 1856*
*Heydenia pretiosa* Förster, 1856*
Genus ***Notanisus*** Walker, 1837
*Notanisus oulmesiensis* (Delucchi, 1962)
*Notanisus versicolor* Walker, 1837**
Genus ***Oodera*** Westwood, 1874
*Oodera circularicollis* Werner & Peters, 2018

Subfamily **Eunotinae** Ashmead, 1904
Genus ***Moranila*** Cameron, 1883*
*Moranila californica* (Howard, 1881)*
Genus ***Scutellista*** Motschulsky, 1859
*Scutellista caerulea* (Fonscolombe, 1832)
*Scutellista nigra* Mercet, 1910*
*Scutellista obscura* (Förster, 1878)*

Subfamily **Macromesinae** Graham, 1959
Genus ***Macromesus*** Walker, 1848
*Macromesus africanus* Ghesquière, 1963

Subfamily **Miscogastrinae** Walker, 1833
Genus ***Ammeia*** Dellucchi, 1962
*Ammeia pulchella* (Delucchi, 1962)
Genus ***Halticoptera*** Spinola, 1811*
*Halticoptera* sp.*
Genus ***Harrizia*** Delucchi, 1962
*Harrizia mira* Delucchi, 1962
Genus ***Miscogaster*** Walker, 1833
*Miscogaster elegans* Walker, 1833*
*Miscogaster maculata* (Walker, 1833)**
Genus ***Rhicnocoelia*** Graham, 1956
*Rhicnocoelia impar* (Walker, 1836)

Subfamily **Ormocerinae** Walker, 1833
Genus ***Systasis*** Walker, 1834
*Systasis encyrtoides* Walker, 1834

Subfamily **Pireninae** Haliday, 1844**
Genus ***Gastrancistrus*** Westwood, 1833**
*Gastrancistrus* aff. *vagans* Westwood, 1833**
Genus ***Macroglenes*** Westwood, 1832
*Macroglenes chalybeus* (Haliday, 1833)

Subfamily **Pteromalinae** Dalman, 1820
Genus ***Anisopteromalus*** Ruschka, 1912
*Anisopteromalus calandrae* (Howard, 1881)
Genus ***Caenocrepis*** Thomson, 1878
*Caenocrepis arenicola* (Thomson, 1878)
Genus ***Callitula*** Spinola 1811*
*Callutila bicolor* Spinola, 1811*
Genus ***Catolaccus*** Thomson, 1878
*Catolaccus crassiceps* (Masi, 1911)
Genus ***Cecidostiba*** Thomson, 1878*
*Cecidostiba fungosa* (Geoffroy, 1785)*
Genus ***Cheiropachus*** Westwood, 1829
*Cheiropachus quadrum* (Fabricius, 1787)
Genus ***Coelopisthia*** Förster, 1856*
*Coelopisthia extenta* (Walker, 1835)*
Genus ***Conomorium*** Masi, 1924
*Conomorium patulum* (Waker, 1835)
*Conomorium pityocampae* Graham 1992*
Genus ***Cratomus*** Dalman, 1820**
*Cratomus megacephalus* (Fabricius, 1793)**
Genus ***Cyclogastrella*** Bukovskii, 1938
*Cyclogastrella clypealis* Bouček, 1965
*Cyclogastrella simplex* (Walker, 1834)
Genus ***Cyrtogaster*** Walker, 1833
*Cyrtogaster vulgaris* Walker, 1833
Genus ***Cyrtoptyx*** Delucchi, 1956
*Cyrtoptyx lichtensteini* (Masi, 1921)
Genus ***Dibrachoides*** Kurdjumov, 1913
*Dibrachoides dynastes* (Förster, 1841)
Genus ***Dibrachys*** Förster, 1856
*Dibrachys affinis* Masi, 1907
*Dibrachys lignicola* Graham, 1969
*Dibrachys microgastri* (Gordh, 1981)
Genus ***Dinarmoides*** Masi, 1924**
*Dinarmoides spilopterus* Masi, 1924**
Genus ***Dinarmus*** Thomson, 1878
*Dinarmus acutus* (Thomson, 1878)
*Dinarmus basalis* (Rondani, 1877)**
Genus ***Dinotiscus*** Ghesquière, 1946*
*Dinotiscus eupterus* (Walker, 1836)*
Genus ***Erythromalus*** Graham, 1956**
*Erythromalus* nov. sp.**
Genus ***Fedelia*** Delucchi, 1962
*Fedelia nebulosa* Delucchi, 1962
Genus ***Hobbya*** Delucchi, 1957*
*Hobbya stenonota* (Ratzeburg, 1848)*
Genus ***Homoporus*** Thomson, 1878
*Homoporus budensis* Erdös, 1953*
*Homoporus destructor* (Say, 1817)
*Homoporus fulviventris* (Walker, 1835)*
*Homoporus gibbiscuta* (Thomson, 1878)*, **
*Homoporus nypsius* (Walker, 1839)
*Homoporus rungsi* Delucchi, 1962
*Homoporus silvanus* Delucchi, 1962
*Homoporus sucinus* Delucchi, 1962
Genus ***Ischyroptyx*** Delucchi, 1956
*Ischyroptyx ligusticus* (Masi, 1921)
Genus ***Lariophagus*** Crawford, 1909
*Lariophagus distinguendus* (Förster, 1841)
Genus ***Meraporus*** Walker, 1834
*Meraporus graminicola* Walker, 1834
Genus ***Merisus*** Walker, 1933*
*Merisus splendidus* Walker, 1834*
Genus ***Mesopolobus*** Westwood, 1833
*Mesopopobus amaenus* Walker, 1834*
*Mesopolobus diffinis* (Walker, 1834)*
*Mesopolobus gemellus* Baur & Muller, 2007*
*Mesopolobus incultus* (Walker, 1834)
*Mesopolobus morys* (Walker, 1848)*
*Mesopolobus nobilis* (Walker, 1834)**
*Mesopolobus spermotrophus* Hussey, 1960*
*Mesopolobus teliformis* (Walker, 1834)*
*Mesopolobus tibialis* (Westwood, 1833)*
*Mesopolobus xanthocerus* (Thomson, 1878)*
Genus ***Metacolus*** Förster, 1856*
*Metacolus unifasciatus* Förster, 1856*
Genus ***Muscidifurax*** Girault & Sanders, 1910
*Muscidifurax raptor* Giraud & Sanders, 1910
Genus ***Nasonia*** Ashmead, 1904*
*Nasonia vitripennis* Walker, 1836*
Genus ***Norbanus*** Walker, 1843
*Norbanus cerasiops* (Masi, 1922)

Genus ***Notoglyptus*** Masi, 1917
*Notoglyptus scutellaris* (Dodd & Girault, 1915)
Genus ***Novitzkyanus*** Bouček, 1861
*Novitzkyanus cryptogaster* Bouček, 1961
Genus ***Oxysychus*** Delucchi, 1956
*Oxysychus regnieri* (Masi, 1934)
Genus ***Pachycrepoideus*** Ashmead, 1904
*Pachycrepoideus vindemmiae* (Rondani, 1875)
Genus ***Pachyneuron*** Walker, 1833
*Pachyneuron aphidis* (Bouché, 1834)
*Pachyneuron coccorum* (Linnaeus, 1758)
*Pachyneuron formosum* Walker, 1833
*Pachyneuron groenlandicum* (Holmgren, 1872)*
*Pachyneuron muscarum* (Linnaeus, 1758)*
Genus ***Peridesmia*** Förster, 1856
*Peridesmia discus* (Walker, 1835)
Genus ***Plutothris*** Förster, 1856*
*Plutothrix sp.**
Genus ***Pseudocatolaccus*** Masi, 1908
*Pseudocatolaccus nitescens* (Walker, 1834)
Genus ***Pteromalus*** Swederus, 1795
*Pteromalus bifoveolatus* Förster, 1861
*Pteromalus chrysos* Walker, 1836
*Pteromalus delvarei* Vago, 2002
*Pteromalus lixi* (Sarra, 1924)
*Pteromalus platyphilus* Walker, 1874*
*Pteromalus puparum* (Linnaeus, 1758)*
*Pteromalus ridens* Vago, 2002
*Pteromalus semotus* (Walker, 1834)*
*Pteromalus vibulenus* (Walker, 1839)*
Genus ***Rhaphitelus*** Walker, 1834
*Rhaphitelus maculatus* Walker, 1834*
Genus ***Roptrocerus*** Ratzeburg, 1848*
*Roptrocerus* aff. *brevicornis* Thomson, 1878*
*Roptrocerus xylophagorum* (Ratzeburg, 1844)*
Genus ***Sedma*** Bouček, 1991
*Sedma dispar* Bouček, 1991
Genus ***Sphegigaster*** Spinola, 1811
*Sphegigaster* aff. *cuscutae* Ferrière, 1959*
*Sphegigaster stepicola* Bouček, 1965
Genus ***Stenomalina*** Ghesquière, 1946
*Stenomalina gracilis* (Walker, 1834)
Genus ***Stenoselma*** Delucchi, 1956
*Stenoselma nigrum* Delucchi, 1956
Genus ***Stinoplus*** Thomson, 1878
*Stinoplus etearchus* (Walker, 1848)
Genus ***Syntomopus*** Walker, 1833*
*Syntomopus thoracicus* Walker, 1833*
Genus ***Toxeumorpha*** Girault, 1915
*Toxeumorpha nigricola* (Ferrière, 1936)
Genus ***Trichomalopsis*** Crawford, 1913
*Trichomalopsis hemiptera* (Walker, 1835)
*Trichomalopsis microptera* (Lindeman, 1887)
Genus ***Trichomalus*** Thomson, 1878
*Trichomalus bracteatus* (Walker, 1935)*
*Trichomalus campestris* (Walker, 1834)*
*Trichomalus gynetelus* (Walker, 1935)*
*Trichomalus sufflatus* Delucchi, 1962

Subfamily **Spalangiinae** Haliday, 1833
Genus ***Spalangia*** Latreille, 1805
*Spalangia cameroni* Perkins, 1910
*Spalangia drosophilae* Ashmead, 1887
*Spalangia endius* Walker, 1839
*Spalangia fuscipes* Nees, 1834
*Spalangia gemina* Bouček, 1963*
*Spalangia nigroaenea* Curtis, 1839
*Spalangia subpunctata* Förster, 1850

Subfamily **Sycoryctinae** Wiebes, 1966
Genus ***Philotrypesis*** Förster, 1878
*Philotrypesis caricae* (Linnaeus, 1762)