



Family Liopteridae as insect regulators of biodiversity (Insecta: Hymenoptera: Cynipoidea)

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Abstract

Liopteridae Family associated with broadleaf forests. At the end of the Eocene, the forests previously continuous broadleaf from Asia and America were permanently separated in the area Beringia emerging new habitats because of the climate change that was taking place. Zona biogeográfica: Nearctic, Western Palearctic, Eastern Palearctic, Neotropical, Afrotropical, Australasiatic oriental. Larval parasitoids of broaching beetles, such as Buprestidae and Cerambycidae host or aparent host of hyperparasitoids. Parasitoid (desenvolvimento integral on or in a single host). The aim of this manuscript is to report the conceptual and taxonomic aspects of Family Liopteridae (Insecta: Hymenoptera: Cynipoidea) as insect regulators (Insecta: Hymenoptera). Bibliographic verification of Family Liopteridae was carried out from 1940 to 2022. Manuscripts published in scientific journals and digital platforms on the subject were examined. This contribution, referring to the Cynipoidea (Cinipidae, Figitidae, Ibaliidade and Liopteridae, is part of a series in which some of these indicators are applied to the groups present in the collection of microhymenopterans, to, through them, to be able to make a diagnosis, set objectives and implement future policies regarding it.

Keywords: Coleoptera; Larvae; Hosts; Cerambycidae; Insect regulators

1. Introduction

Liopteridae Family associated with broadleaf forests. At the end of the Eocene, the forests previously continuous broadleaf from Asia and America were permanently separated in the area Beringia emerging new habitats because of the climate change that was taking place. Zona biogeográfica: Nearctic, Western Palearctic, Eastern Palearctic, Neotropical, Afrotropical, Australasiatic oriental ([Figures 1 and 2] [1.2.3.4.5.6.7,8]).

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Source: http://www.galerie-minsecte.org/fichiers/xper3/hym/taxons/l_tax_liopteridae

Figure 1 Specimen of Liopteridae family

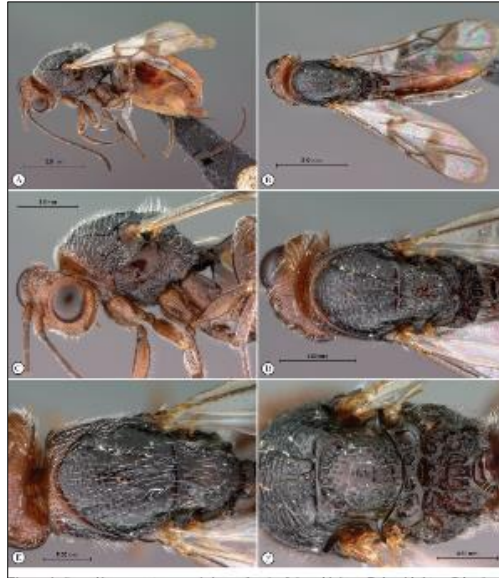


Source: <http://treatment.plazi.org/id/2712E307-A943-C21E-FCC7-F9C1FD83F9BD>

Figure 2 Plate 3. Liopteridae. Fig. 184, *Liopterion* sp., USNMENT01231879. Fig. 185, *Oberthuerella lenticularis* Saussure, 1890, USNMENT00764775. Fig. 186, *Peras* sp., UFES68459. Figs. 187 and 189, *Paramblynotus virginianus* Liu, Ronquist and Nordlander, 2007, USNMENT01231827. Fig. 188, *Paramblynotus* sp., USNMENT01231878

1.1. Diagnostic

Characters. Lateral surface of pronotum and dorsal surface of scutellum foveate; metatibia shorter than metafemur; metapleura with depression; metasoma with 4th, 5th or 6th tergum, in dorsal view, larger than the others; petiolated metasoma. They measure from 5.0 to 15.0 mm. Metasoma: junction with the mesosoma (Figures 3 and 4).



Source: Van Noort S, Buffington ML. Revision of the Afrotropical Mayrellinae (Cynipoidea: Liopteridae), with the first record of *Paramblynotus* from Madagascar. Journal of Hymenoptera Research. 2013; 31: 1-64

Figure 3 *Paramblynotus seyrigi* sp. n., holotype female. A lateral habitus B dorsal habitus C head and mesosoma, lateral view D head and mesosoma, dorsal view e mesosoma, dorsal view F scutellum and propodeum, dorsal view



Source: Van Noort S, Buffington ML. Revision of the Afrotropical Mayrellinae (Cynipoidea: Liopteridae), with the first record of *Paramblynotus* from Madagascar. Journal of Hymenoptera Research. 2013; 31: 1-64

Figure 4 *Paramblynotus seyrigi* sp. n., holotype female. A pronotum, antero-dorsal view B mesopleuron C head, anterior view D face, anterior view e vertex, dorso-lateral view F metasoma, lateral view

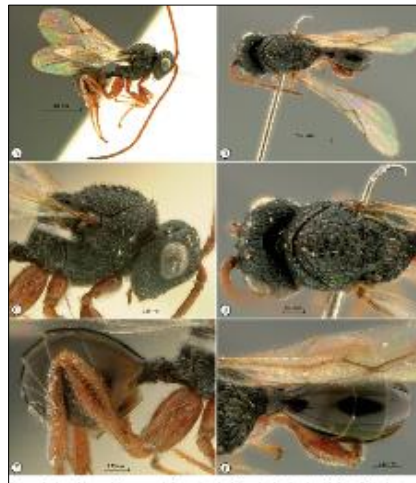
Between coxae 3 or slightly above, coxae and metasoma separated at most by their width Metasoma: shape of tergite 1 in profile view T1 and T2 neither nodulous nor scaly: T1 not stalked or regularly widened towards the back. Metasoma: length of the visible ovipositor (= sheath). Barely exerted, or transformed into a sting, not exceeding the apex of the metasoma. Short to moderately long, not longer than hind leg (Figure 5).



Source: Van Noort S, Buffington ML. Revision of the Afrotropical Mayrellinae (Cynipoidea: Liopteridae), with the first record of *Paramblynotus* from Madagascar. Journal of Hymenoptera Research. 2013; 31: 1-64

Figure 5 *Paramblynotus seyrigi* sp. n., holotype female. A ovipositor lateral view B wings C tarsal claws D labels

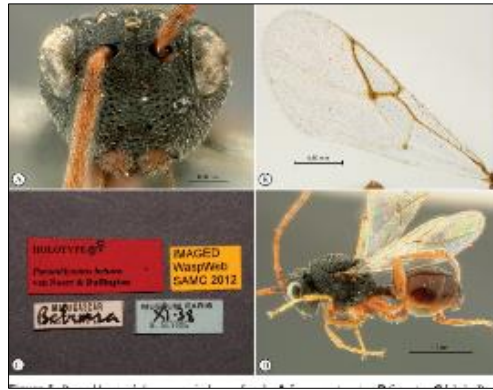
Mesosoma: posterior-dorsal of pronotum Reaching tegula (Tg): mesopleuron (Mp) separated from mesonotum (Mn), prepectus undifferentiated Body: metallic colored luster? No, no metallic sheen on the cuticle Forewing: common wing venation patterns. Pterostigma ausente, marginal cell (Marg) closed at apex and acute posteriorly Body: overall size, from head to apex of metasoma. Big, but 10mm Head: height of the insertion of the antenna (Figure 6).



Source: Van Noort S, Buffington ML. Revision of the Afrotropical Mayrellinae (Cynipoidea: Liopteridae), with the first record of *Paramblynotus* from Madagascar. Journal of Hymenoptera Research. 2013; 31: 1-64

Figure 6 *Paramblynotus behara* sp. n., holotype female. A lateral habitus B dorsal habitus C head and mesosoma, lateral view D head and mesosoma, dorsal view e metasoma, lateral view F metasoma, dorsal view

Higher on the face, distinctly separated from the clypeus Forewing: maximum length of fringing setae. But corteses or indistintos. Hind wing: general shape. Entirely membranous from the base (usually larger insects). Fore wings: costal cell. Undefined cell: venation absent, or only one rib present Forewing: pterostigma ausente, indistinct or linear (Figures 7 and 8) [1,2,3,4]



Source: Van Noort S, Buffington ML. Revision of the Afrotropical Mayrellinae (Cynipoidea: Liopteridae), with the first record of *Paramblynotus* from Madagascar. Journal of Hymenoptera Research. 2013; 31: 1-64

Figure 7 *Paramblynotus behara* sp. n., holotype female. A face, anterior view B forewing C labels. Paratype female (Bekily) D habitus, lateral view



Source: Matthew LB van Noort S. Revision of the Afrotropical *Oberthuerellinae* (Cynipoidea, Liopteridae) Matthew LB, van Noort S. ZooKeys. 2012; 202: 1-54

Figure 8 *Oberthuerella crassicornis* Benoit, holotype A scutellum and petiole, dorsolateral view B metasoma, lateral view C metasoma, dorsal view D fore and hind wings E fore and hind wings F labels

1.2. Biology

larval parasitoids of broaching beetles, such as Buprestidae and Cerambycidae and larvae de insectos xylophagous. Host (or aparent host of hyperparasitoids). Parasitoid (desenvolvimento integral on or in a single host). Host (or aparent host of hyperparasitoids) [1,3,4,5,6,7].

1.3. Taxonomy

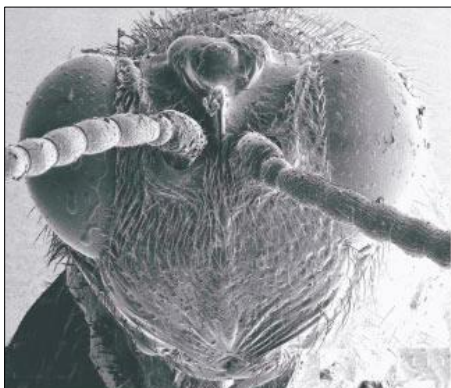
The family has a cosmopolitan distribution, but occurs predominantly in tropical and subtropical regions. It comprises 170 species divided into 11 genera. About 60 species in 4 genera occur in the Neotropical Region.

This family consisted of three subfamilies (Dallatorrellinae, Oberthuerellinae and Liopterinae) but the phylogenetic study showed that the Mayrellinae (including by Weld in Dallatorellinae) had to be considered as an independent subfamily

Subfamilies: Dallatorrellinae, Liopterinae, Mayrellinae and Oberthuerellinae (Figures 9, 10, 11, 12 and 13). [9,10,11,12,13,14].

Subfamily: Dallatorrellinae

Genus and Species: *Dallatorella* and *Mesocynips*: Species: *Dallatorella albata* (Weld, 1944), *Dallatorella carinifrons* (Cameron, 1910), *Dallatorella maculata* Liu, 2001, *Dallatorella maxima* Liu, 2001, *Dallatorella pulla* Liu, 2001, *Dallatorella ronquisti* Liu, 2001, *Dallatorella rubriventris* Kieffer, 1911 and *Dallatorella sinica* Liu, 2001. *Mesocynips insignis* Cameron, 1903



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 9 *Dallatorella* Kieffer, 1911

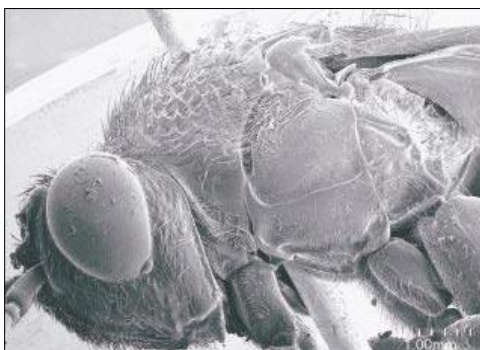
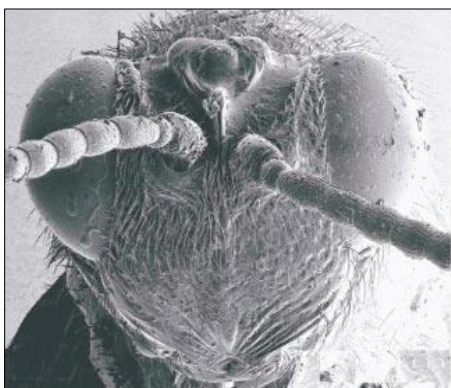
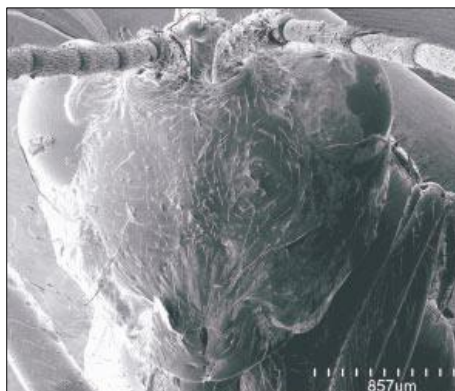


Figure 10 *Dallatorella albata* (Weld, 1944)



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 11 Genus *Mesocynips* Cameron, 1903



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 12 *Mesocynips insignis* Cameron, 1903



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 13 Subfamily Liopterinae

Subfamily: *Liopterinae*: **Genus:** *Liopter* Perty, 1833, *Peras* Westwood, 1837 and *Pseudibalia* Kieffer, 1911: **Species:** *Liopter* *abdominale* Westwood, 1874 (Brazil), *Liopter* *apicale* Westwood, 1874 (Brazil), *Liopter* *bicolor* Hedicke, 1940 (Bolivia), *Liopter* *bispinosum* Kerrich, 1940 (French Guiana), *Liopter* *compressum* Perty, 1833 (Brazil), *Liopter* *compressum* minus Kerrich, 1940 (Brazil, Peru), *Liopter* *immarginatum* Kerrich, 1940 (Brazil), *Liopter* *levilaterale* Kerrich, 1940 (Brazil) and *Liopter* *nigripenne* Westwood, 1874 (Brazil) (Figure 14).



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 14 *Liopter* species

Peras *biroi* (Kerrich, 1940) (Peru) *Pears* *clapicorne* (Westwood, 1874) (Brazil), *Pears* *fenestratum* (Ashmead, 1895) (Brazil), *Pears* *puscicorne* (Westwood, 1874) (Brazil), *Pears* *intermedium* (Kerrich, 1940)) (Brazil), *Pears* *autazense* (Kerrich, 1940) (Brazil), *Pears* *laticeps* (Kerrich, 1940) (Brazil), *Pears* *nigra* Westwood, 1837 (French Guiana), *Pears* *rufipes* (Kieffer, 1911) (Brazil, Mexico), *Pears* *scaberrimum* Kieffer, 1911 (Brazil, Mexico) and *Pears* *subpetiolatum* (Westwood, 1874) (Brazil) (Figure 15).



Figure 15 *Peras* species (Peru)

Subfamily Mayrellinae: Genus: *Kiefferiella* Ashmead, 1903 (Nearctic) and *Paramblynotus* Cameron, 1908 (Worldwide): **Species:** *Paramblynotus apeosus* Liu and Kovalev, 2007, 2007, *Paramblynotus barbara* Liu, Ronquist & Nordlander, 2007, *Paramblynotus beckeri* Liu, Ronquist & Nordlander, 2007, *Paramblynotus borneanus* (Weld, 1922) *Paramblynotus cheni* Liu, Ronquist & Nordlander, 2007, *Paramblynotus chrysochaites* Liu, Ronquist & Nordlander, 2007, *Paramblynotus clarus* (Weld, 1922), *Paramblynotus conspiratus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus coracinus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus distinctus* Liu, Ronquist & Nordlander, 2007 & Nordlander, 2007, *Paramblynotus eriki* Liu, Ronquist & Nordlander, 2007, *Paramblynotus esakii* (Yasumatsu, 1959), *Paramblynotu fucosus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus glaberus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus grossus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus hainanensis* Liu, Ronquist & Nordlander, 2007, *Paramblynotus unusual* Liu, Ronquist & Nordlander, 2007, *Paramblynotus isolatus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus kitrinocarus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus kosugii* Watanabe and Sakagami, 1951, *Paramblynotus lutepennis* Liu, Ronquist & Nordlander, 2007, *Paramblynotus miniatus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus miltocephalus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus nebulosus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus niger* (Kieffer, 1916), *Paramblynotus nipponensis*, Liu, Ronquist & Nordlander, 2007, *Paramblynotus obscurus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus ornatus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus pubifemoratus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus punctulatus* Cameron, 1908, *Paramblynotus reticulatus* (Kieffer, 1910), *Paramblynotus robustus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus rufipes* Liu, Ronquist & Nordlander, 2007, *Paramblynotus shimenensis* Liu, Ronquist & Nordlander, 2007, *Paramblynotus stigi* Liu, Ronquist & Nordlander, 2007, *Paramblynotus venoforticulus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus weiae* Liu, Ronquist & Nordlander, 2007, *Paramblynotus yuani* Liu, Ronquist & Nordlander, 2007, *Paramblynotus badius* Liu, Ronquist & Nordlander, 2007, *Paramblynotus braziliensis* Liu, Ronquist & Nordlander, 2007, *Paramblynotus carinivertex* Liu, Ronquist & Nordlander, 2007, *Paramblynotus coruscus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus ricanus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus malayensis* (Weld, 1922), *Paramblynotus ruficollis* Cameron, 1909 2007, *Paramblynotus liaoi* Liu, Ronquist & Nordlander, 2007, *Paramblynotus marginatus* Liu and Kovalev, 2007, *Paramblynotus pausatus* Liu and Kovalev, 2007, *Paramblynotus pronus* Liu and Kovalev, 2007, *Paramblynotus scaber* (Belizin, 1951) & Buffington, 2013, *Paramblynotus cameroonensis* Liu, Ronquist & Nordlander, 2007, *Paramblynotus carinatus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus claripennis* Liu, Ronquist & Nordlander, 2007, *Paramblynotus coxatus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus diminutus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus dzangasangha* van Noort & Buffington, 2013, *Paramblynotus fuscipiculus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus immaculatus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus jacksoni* Liu, Ronquist & Nordlander, 2007, *Paramblynotus kekenboschi* Liu, Ronquist & Nordlander, 2007, *Paramblynotus maculipennis* Liu, Ronquist & Nordlander, 2007, *Paramblynotus matele* van Noort & Buffington, 2013, *Paramblynotus minutus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus nigricornis* Benoit, 1956, *Paramblynotus parinari* Buffington & van Noort, 2013, *Paramblynotus prinslooii* Liu, Ronquist & Nordlander, 2007, *Paramblynotus ruvubuensis* van Noort & Buffington, 2013, *Paramblynotus rwandensis* Liu, Ronquist & Nordlander, 2007 and *Paramblynotus samiatu*s (Figures 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 and 27) [15,16,17, 18,19].



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 16 *Paramblynotus seyrigi* van Noort & Buffington, 2013, *Paramblynotus alexandriensis* Buffington & van Noort, 2013, *Paramblynotus bayangensis* van Noort & Buffington, 2013, *Paramblynotus dzangasangha* van Noort & Buffington, 2013, *Paramblynotus matele* van Noort & Buffington, 2013, *Paramblynotus nigricornis* Benoit, 1956, *Paramblynotus parinari* Buffington & van Noort, 2013, *Paramblynotus ruvubuensis* van Noort & Buffington, 2013, *Paramblynotus trisetosus* Benoit, 1956, *Paramblynotus virginianus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus behara* van Noort & Buffington, 2013, *Paramblynotus mixtus* Liu, Ronquist & Nordlander, 2007, *Paramblynotus yangambicolus* Benoit, 1956 and *Paramblynotus zohy* van Noort & Buffington, 2013



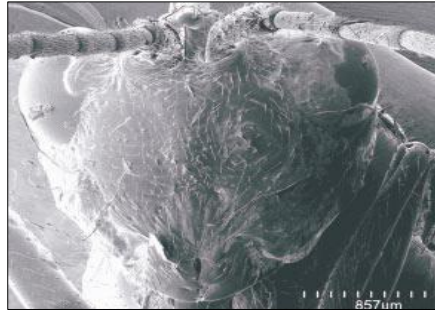
Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 17 *Paramblynotus Cameron*, 1908 (Worldwide)



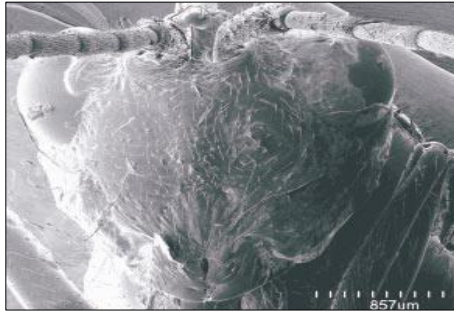
Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 18 Subfamily Oberthuerellinae



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 19 Genus *Mesocynips* Cameron, 1903



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 20 *Mesocynips insignis* Cameron, 1903



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 21 Genus *Paramblynotus* Cameron, 1908 (Worldwide)



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 22 Genus *Oberthuerella*



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 23 Subfamily: Oberthuerellinae: Genus: *Oberthuerella*, *Tessmannella* and *Xenocynips*: **Species:** *Oberthuerella abscinda* Quinlan, 1979, *Oberthuerella aureopilosa* Benoit, 1955, *Oberthuerella breviscutellaris* Benoit, 1955, *Oberthuerella crassicornis* Benoit, 1955, *Oberthuerella cyclopia* Buffington and van Noort, 2012, *Oberthuerella eschara* Buffington and van Noort, 2012, *Oberthuerella kibalensis* van Noort and Buffington, 2012, *Oberthuerella lenticularis* Saussure, 1890, *Oberthuerella longicaudata* Benoit, 1955, *Oberthuerella longispinosa* Benoit, 1955, *Oberthuerella nigra* Kieffer 1910 (Figure ausente), *Oberthuerella nigrescens* Benoit, 1955, *Oberthuerella pardolatus* Buffington and van Noort, 2012, *Oberthuerella sharkeyi* Buffington and van Noort, 2012, *Oberthuerella simba* Buffington and van Noort, 2012, *Oberthuerella tibialis* Kieffer, 1904, *Oberthuerella transiens* (Benoit, 1955) and *Oberthuerella triformis* Quinlan, 1979



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 24 Genus *Tessmannella*



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 25 *Tessmannella copelandi* Buffington and van Noort, 2012 (Kenya), *Tessmannella expansa* Quinlan, 1979 (Gabon), *Tessmannella kiplingi* Buffington and van Noort, 2012 (Congo), *Tessmannella nigra* Hedicke, 1912 (Democratic Republic of Congo, Equatorial Guinea), *Tessmannella roberti* Buffington and van Noort, 2012 (Congo) and *Tessmannella spinosa* Hedicke, 1912 (Equatorial Guinea)



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 26 Genus *Xenocynips*



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org. Photographs © Matt Buffington & Simon van Noort (Iziko Museums of South Africa) Photographs © Zhiwei Liu. Photographs © Matt Buffington (Systematic Entomology Laboratory, USDA/ARS)

Figure 27 Species: *Oberthuerella abscinda* Quinlan, 1979, *Oberthuerella aureopilosa* Benoit, 1955, *Oberthuerella breviscutellaris* Benoit, 1955, *Oberthuerella crassicornis* Benoit, 1955, *Oberthuerella cyclopia* Buffington and van Noort, 2012, *Oberthuerella eschara* Buffington and van Noort, 2012, *Oberthuerella kibalensis* van Noort and Buffington, 2012, *Oberthuerella lenticularis* Saussure, 1890, *Oberthuerella longicaudata* Benoit, 1955, *Oberthuerella longispinosa* Benoit, 1955, *Oberthuerella nigra* Kieffer, 1910, *Oberthuerella nigrescens* Benoit, 1955, *Oberthuerella pardolatus* Buffington and van Noort, 2012, *Oberthuerella sharkeyi* Buffington and van Noort, 2012, *Oberthuerella simba* Buffington and van Noort, 2012, *Oberthuerella tibialis* Kieffer, 1904, *Oberthuerella transiens* (Benoit, 1955) and *Oberthuerella triformis* Quinlan, 1979

Objective

The aim of this manuscript is to report the conceptual and taxonomic aspects of Family Liopteridae (Insecta: Hymenoptera: Cynipoidea) as insect regulators.

2. Methods

For this, a bibliographic survey of Sphecidae was carried out in the years 1940 to 2021. Only complete articles published in scientific journals and expanded abstracts presented at national and international scientific events were considered. Data were also obtained from platforms such as Academia.edu, Frontiers, Qeios, Biological Abstract, Publons, Dialnet, World, Wide Science and Springer.

3. Studies conducted and selected

3.1. Study 1

This contribution, referring to the Cynipoidea, is part of a series in which some of these indicators are applied to the groups present in the collection of microhymenopterans, to, through them, to be able to make a diagnosis, set objectives and implement future policies regarding it (Figure 28).



Source: <https://en.wikipedia.org/wiki/Cynipoidea>

Figure 28 Superfamily Cynipoidea

To carry out the present study, the information of the 1,714 specimens of mounted cynipoidea from the collection of microhymenopterans of the Museo de La Plata, (MLP, Argentina) was used and compared with that registered for the 670 species of the region Neotropical (Figure 29).



Source: <http://www.waspweb.org/cynipoidea/Ibaliidae/Classification/index.htm>

Figure 29 Ibaliidae Family

The representatives of the superfamily Cynipoidea (Hymenoptera Apocrita) constitute a monophyletic group, systematically arranged in five families. It has more than 3,000 described species, gathered in 224 genera. More than 50% of the species behave as primary or secondary parasitoids of other useful or harmful insects; the rest are phytophagous, galigenous or inquiline in other zoocecidians. They are present in all biogeographical regions and their distribution generally coincides with that of the host insects and plants (Figure 30).



Source: <https://genent.cals.ncsu.edu/insect-identification/order-hymenoptera/family-cynipidae/>

Figure 30 Cynipidae Family

The taxonomic representativeness of the collection was studied at three levels: superfamily, family and subfamily. The Cynipoidea collection is representative of 100% of the families present in the Neotropical region, 100% of the subfamilies, 58% of the genera and only 15% of the species values from which it can be deduced that in this group the suprageneric representativeness is high, the generic one is medium and the specific one is low (Figure 31).



Source: <http://www.waspweb.org/cynipoidea/figitidae/index.htm>

Figure 31 Figitidae Family

The taxonomic representativeness of the collection was studied at three levels: superfamily, family and subfamily. The Cynipoidea collection is representative of 100% of the families present in the Neotropical region, 100% of the subfamilies, 58% of the genera and only 15% of the species values from which it can be deduced that in this group the suprageneric representativeness is high, the generic one is medium and the specific one is low.

As we saw earlier, four of the five known families of Cynipoidea are cited in the Neotropical region (Ibaliidae, Liopteridae, Cynipidae and Figitidae) and all are represented in this collection (Tables 1 and 2) [20,21,22].

Table 1 Cynipoidea. Quantitative appraisal, family level

Families	Material type	Argentine material overall collection	foreign material collection generates
Cynipidae	10	128	20
Figitidae	165	889	488
Ibaliidae	0	8	4
Liopteridae	0	2	0

Table 2 Cynipoidea. Taxonomic representativeness, Family level

Liopteridae	Subfamilies	Genera	Species
World Cups	4	11	80
Neotropicales	2	4	50
In collection	1	1	1
% Collected	50%	25%	2

Suprtfamily Cynipoidea.

Family Liopteridae.

Subfamily: Mayrellinae

Genera: *Paramblynotus*

Paramblynotus zonatus Weld, 1944 (Figure 27).



Source: van Noort S. WaspWeb: Hymenoptera of the Afrotropical region. 2022. URL: www.waspweb.org

Figure 32 *Paramblynotus* Cameron, 1908

4. Conclusion

This contribution, referring to the Cynipoidea (Cinipidae, Figitidae, Ibaliidae and Liopteridae, is part of a series in which some of these indicators are applied to the groups present in the collection of microhymenopterans, to, through them, to be able to make a diagnosis, set objectives and implement future policies regarding it.

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