

158. (1421) *Agdistis meridionalis* Z. 10. V. 12. Ham. Salahhin  
det. Rbl.).
159. (2961) *Nothris verbascella* Hb. El Kroubs Tagfang 8. V. 12.;  
eher lichte, südliche Form; stark abgeflogen (det. Rbl.).
160. (3016) *Oeocecis gyonella* Gn. Raupen in Gallen an *Limoniastrum*  
*gyonianum* knapp beim Bade Ham. Salahhin sehr gemein IV. 11. und  
V. 12. Herr Mitterberger, Steyr O.-Oe. teilte mir unterm 30. XI. 13  
mit, dass die von mir vor 2 Jahren übersandten Raupen bis jetzt noch  
keinen Falter ergeben haben. Die Raupen befinden sich noch in lebendem  
Zustande in der Galle, ohne zur Verpuppung geschritten zu sein. Mir  
chlüpften die ersten Falter aus den Ende April 1911 mitgenommenen  
Gallen bereits Anfang Oktober desselben Jahres; kein Stück überwinterte  
veder als Puppe noch als Raupe. Die Puppenruhe hatte bei meinen  
Stücken 14 Tage gedauert. Die Ursache der Verspätung bei den  
Mitterberger's Raupen dürfte wohl in gänzlich ungeeignetem Alpen-  
klima zu suchen sein.
161. (3282) *Depressaria discipunctella* H. S. 10. V. 12. Ham. Salahhin  
det. Rbl.).
162. (3602) *Stagmatophora dohrni* Z. Ende IV. 11. Biskra.
163. (4693) *Nemotois latreillellus* F. 7. V. 12. Constantine (Tagfang).
164. (4695) *N. pantherellus* Gn. Lue. 8. V. 12. El Kroubs (Tagfang).

#### Corrigenda:

- pag. 82, 12. Zeile von unten: *Euchloë falloui* kann nicht gerade als spezifische  
Biskraer-Art aufgefasst werden, da sich ihr Verbreitungsgebiet auch auf  
andere Teile Algeriens sowie auch Nordostafrika und die sinaitische Halb-  
insel erstreckt.
- pag. 83, 19. Zeile von oben: statt „Mitterber-Steyr“ lese man „Mitterberger-Steyr“.
- pag. 85, 9. Zeile von oben: Nach „Forma biformata“ ist zu streichen: „(ab. indiv.)“,  
da *biformata* die ständige Herbstform und keine Zufalls-Aberration  
repräsentiert.

### Hosts of Insect Eggparasites in Europe, Asia, Africa and Australasia, with a Supplementary American List.

By A. A. Girault, Nelson N. Q., Austral.  
(Fortsetzung aus Heft 4.)

#### Supplementary American Records. (See Girault, 1907, 1911 a.)

##### Hemiptera.

<i>Delphax saccharivora.</i>	<i>Anagrus armatus</i>	Girault, MS. notes,
Antilles	(Ashmead) .	1913 (D. L. van Dine)
<i>Zempoasca flavescens.</i>	<i>Anagrus armatus</i>	Girault, 1913a, pp.
N. A.	(Ashmead)	62—63
	? <i>Polynema consobrinus</i>	id., ib., p. 197
	Girault	
<i>Goniopsis chrysocoma</i>	<i>Telenomus goniopsis</i> Crawf.	Crawford, 1913, pp.
		244—245
<i>Ioriola arquata.</i> Trini- dad	<i>Trichogrammatella tristis</i> Girault	Girault, 1911 d, p. 128
	<i>Uscunella bicolor</i> Girault	Girault, 1911d, p. 129
	<i>Tumidifemur pulchrum</i> Gir.	Girault, 1911 d, p. 125
<i>Ormenis</i> species. An- tilles	<i>Phanurus flavus</i> Dodd.	Girault, MS. notes, 1913

<i>Zelus longipes</i> Linnaeus	<i>Eupelmus zeli</i> Ashmead	Dalla Torre, 1898 p. 278
Hymenoptera.		
<i>Arge salicis</i> Rohwer. N. A.	<i>Winnemana argei</i> Crawford	Crawford, 1912 b, p. 176
Closterocerus winnemanae Crawford*)		
Lepidoptera.		
<i>Calpodes ethilius</i> Cram. Antilles	<i>Trichogramma minutum</i> Riley	Girault, 1911 a, p. 150
<i>Diatraea saccharalis</i> Fabricius. Porto Rico	<i>Trichogramma minutum</i> Riley	Girault, MS. notes 1913 (D. L. van Dine)
<i>Diatraea saccharalis</i> Fabricius. Mexico	<i>Trichogramma fasciatum</i> (Perkins)	Perkins, 1912, p. 19
<i>Helochara communis.</i> N. A.	<i>Trichogramma helocharae</i> Perkins	Kirkaldy, 1907, p. 5
<i>Orgyia antiqua.</i> N. A.	<i>Telenomus dalmani</i> Ratz.	Crawford, 1911 b, p. 270
Orthoptera.		
Mantidae. Mexico	<i>Podagrion echthrus</i> Crawf.	Crawford, 1912 b, p. 163—164
Platyptera.		
<i>Chauliodes.</i> U. S.	<i>Trichogramma semblidis</i> (Aurivillius)	Girault, 1911 c, p. 49—50

In North America, a third possible eggparasite of *Cimbex americanus* Leach is recorded by Girault (1912, pp. 81—82). In Panama, *Uscaanoidea nigriventris* Girault is parasitic upon froghopper eggs. In Mexico, *Oligosita plebeia* (Perkins) lives in jaisid eggs in sugar cane as does also *Abella prima* (Perkins) and *Gonatocerus nivalis* Girault and *Gonatocerus koebeliae* Perkins; in the same place, *Gonatocerus mexicanus* Perkins lives on jassiid eggs in grass and *G. juvalor* in fulgorid eggs in cane. The "Rileya" species of Bruner (See Girault, 1907, p. 36), parasitic in North America upon the eggs of *Oecanthus latipennis* Riley and *O. niveus* De Geer is *Rileya oecanthe* Ashmead (1894, p. 321). In St. Vincent, *Telenomus zethos* Walker is parasitic upon lepidopterous eggs; in the United States of America, l. c. a species of *Telenomus* is apparently recorded from ants (?), Proc. Ent. Soc. Washington, V, p. 308, and see ib., II, p. 124. *Pteratomus putnamii* on *Anthophorabia* (see Packard, 1880, p. 202). In Brazil, *Anastatus coreophagus* Ashmead is parasitic upon coreid egg and *A. punctiventris* of the same author on the eggs of *Locustidae*. In Porto Rico, *Oligosita comosipennis* Girault, *Abella prima* (Perkins), *Ufen niger* (Ashmead) and *Aphelinoides semifuscipennis albipes* Girault a parasitic upon jassid eggs on sugar cane.

The following references have bearing upon the subject and should be consulted in order to complete the records; I have not been able to see them since: Ent. Meddel., 1903, pp. 192—197 (Kryger upon host of chalcidoids; at least four genera of Trichogrammatids are connected with hosts; Denmark); Marchal in Annales Soc. Ent. France, LXIX

\*) Probably secondary upon the Winnemana.

pp. 102—112 gives a list of hosts possibly including egg-parasites; Jacobs in *Annales Soc. Ent. Belgique*, XLVIII, p. 308 also gives a short list of hosts; Rondani in *Bull. Soc. Ent. Italiana*, Anno III and IV (about 1871 and 1872). Fitch and Bridgeman in *Entomologist*, London, XVI, pp. 64—69; Fitch, ib., XVII, pp. 67—69 (see also XV pp. 93, 94, XIV, pp. 138 ff. and XIII. *Zoological Record*, 1895, p. 258 (Hungarian hosts of some parasites). Bostock in *Nature*, XXIV, pp. 356—357. *Zool. Jahrbuch*, 1910, vol. 29, Nr. 2, pp. 105—124 (an undetermined parasite on *Pyrops candelaria* Linn.). Rondani, 1870, *Arch. p. Zool.* (2), 11, pp. 10—16, pl. 1, figs. 1—11. Lichtenstein and Frey-Gessner in *Le Nat.*, I, p. 50, 1879. Thomson, 1878, *Hymenop. Scandin.*, V, p. 117. The Ent., London, Dec. 1889. *Agric. Journal India*, I (1906), pp. 97—114. Enoch in *Journal Quekett Club* (2), VI, 1896, p. 275; *Proc. Ent. Soc. London*, 1896, p. 183; ib., 1899, p. XV; ib., 1900, p. XII; *Nature*, LVIII, p. 175 and LIV, p. 28; in *Ent. Mag.*, 1898, p. 152 and XXXII (*Prestwichia aquatica* Lubbock). Heymons in *Deutsche Ent. Zeitschr.*, 1908, pp. 138—141. Howard, 1891, *Proc. U. S. Nat. Museum*, XIV, p. 568 et al. Ashmead 1893 on *Sceliomorpha bisulca* and De Dalla Torre, 1898, p. 496.

The following families and genera of the Hymenoptera are now known to be undoubtedly true parasites of insect eggs, in the sense of this paper.

Family.	Genera.
Mymaridae	All.
Trichogrammatidae	All.
Eulophidae	<i>Paraphelinus</i> Perkins <i>Ooletrastichus</i> Perkins <i>Closterocerus</i> Westwood (in part) <i>Tetrastichus</i> Haliday (in part) <i>Foersterella</i> Dalla Torre <i>Perissopterus</i> Howard (in part) <i>Winnemana</i> Crawford <i>Nesomyia</i> Ashmead <i>Parachrysocharis</i> Girault <i>Hyperiteles</i> Foerster (secondary) <i>Pleurotropis</i> Foerster (secondary) <i>Mestocharis</i> Foerster (secondary) ? <i>Tetracampe</i> Foerster <i>Pterosemella</i> Girault <i>Misocorus</i> Rondani (= <i>Anastatus</i> ) <i>Agiommatus</i> Crawford <i>Chrysolampus</i> Spinola ? <i>Pteromalus</i> Swederus (only in part) <i>Cryptogaster</i> Walker <i>Ericestus</i> Crawford <i>Encyrtus</i> <i>Oencyrtus</i> Ashmead <i>Anastatus</i> Motschulsky <i>Eupelmus</i> Dalman (in part) <i>Dinocarsis</i> Foerster <i>Schedius</i> Howard
Pteromalidae	
Miscogasteridae	
Encyrtidae	

Encyrtidae	<i>Tyndarichus</i> Howard
	<i>Fulyoridicida</i> Perkins
	<i>Ectopioignatha</i> Perkins
	<i>Leurocerus</i> Crawford
Eurytomidae	<i>Rileyini</i> (mostly)
Callimomidae	<i>Podagrion</i> Spinola
	<i>Pachytomoides</i> Girault
Scelionidae	All.
Evanidae	<i>Evania</i>

Parasites of insect eggs over the entire earth seem to be overwhelmingly hymenopterous. For an exception, see the second part of my American list (Girault, 1911a) where an unknown Dipterous egg parasite is recorded. All (with the one exception) of the parasites of embryonic insects are included within the great group of the Hymenoptera Parasitica where all the species are parasitic upon insects or their allies, with the exception of some small tribes which are phytophagous. Of these great complexes of the Hymenoptera Parasitica, however, the parasitism of embryos is present usually only in those groups which comprise species of small stature. These are, of course the *Chalcidoidea* and the *Proctotrypoidea*; of the *Ichneumonoidea* only the anomalous *Evanidae* parasitize eggs. In the first two great groups, size again seems to be related to the habit of parasitizing embryos, for the smallest of them, namely the *Mymaridae* and the *Trichogrammatidae* are exclusively of this habit. The relation, in a word, is so striking that this habit appears to be a secondary adaptation of the parasites to their hosts. One could conclude from this that the parasites of small size finding the eggs of insects suitable and sufficient as food for their progeny, gradually adopted them as their food and hosts, abandoning their former larval hosts.\*). Parasitism, from its very nature, must be of secondary origin. The first animals could not have been parasites if the first insects could not have been insect parasites. Parasitism of insects upon insects is of secondary origin, an adaptive habit. We know this from the phylogeny of insects and from the present surviving habits of the great majority of them. The tendency to simplification or to specialization present in all parasites is another evidence in favour of this fact. Parasitism of the eggs of insects does not differ from parasitism of the larva and there is no especial reason why insect egg-parasites should always be Hymenopterous. We have some reason for believing, however, that the parasitism of insect embryos is a later adaptation, since for one thing insect egg-parasites themselves are probably later phylogenetic developments. More than this, they are of small size while their ancestors were of large stature; also they are exceptions in the groups to which they belong and appear to be descendants, rather than precursors or contemporaries, of their allies. Taken as a whole, they also seem highly adaptive and variable; if some of them, the capacity for rapid reproduction and succession of developmental cycles is enormous (e. g. *Trichogramma minutum*), surpassing, no doubt that of any other insects. (Schluss folgt.)

\*) On the other hand, it is possible that the small size of eggparasites is due to the effect of their hosts, the amount of food not being sufficient to produce largeness. But I do not believe this is probable from the nature of the case.

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