Linzer biol. Beitr.	26/1	437-442	8.7.1994

Aphid parasitoids (Hym., Braconidae, Aphidiinae) of Reunion Island

P. STARÝ, G. REMAUDIÈRE & J. ETIENNE

A b s t r a c t : *Aphidius colemani* VIER., *A. camerunensis* MACK., *A. matricariae* HAL., *A. rosae* HAL. and *Diaeretiella rapae* (M'INT.) were reared from various aphid species in Reunion Island.

K e y - w o r d s : Reunion Island, aphids, parasitoids, fauna, biocontrol

Aphidius colemani was found the dominant species. Parasitoid spectrum of (pest) aphids was determined as very poor, represented mostly by a single species. Recommendations for introduction of other parasitoid species as biocontrol agents are presented.

Research on aphids and their parasitoids of the ethiopian region (see REMAUDIÈRE & AUTRIQUE 1985) has stimulated interest paid to the utilisation of the obtained results in some of the neighbouring areas as well.

The Reunion Island represents such an area. Very little has been known on the aphid parasitoids. STARÝ, REMAUDIÈRE & LECLANT (1973, 1977) recorded three species. QUILICI et al. (1988) published a review of aphids and their natural enemies of Reunion Island, but the new information on the aphidiid parasitoids is low.

The aphid and parasitoid material used in the present paper was collected and reared by J. Etienne, a small part comes also from the IRAT collection (S.Quilici). Aphids were identified by G. Remaudiere and the parasitoids by P. Starý.

Review of parasitoid/host associations

Aphidius camerunensis MACKAUER

Sitobion sp.: La Bretagne, 25.10.1976.

Aphidius colemani VIERECK

Aphis craccivora KOCH: La Bretagne, 7.10.1971 (STARÝ et al. 1973, as *A. platensis* BRETH. Dtto, on Compositae. Dtto, 20.10.1976, *Glyricidia maculata* (STARÝ & al. 1973). Dtto, 30.11.1977, *Glyricidia* sp. Dtto, 30.11.1977, 24.11.1973, *Desmanthus virgatus*. Dtto, 24.11.1973, *Desmodium intortum*. Dtto, 14.8.1973, *Glyricidia maculata*. Gambuston, 12.9.1973, *Portulaca oleracea*.

Aphis gossypii GLOV: La Plaine St. Paul, 19.9.1973, *Hibiscus lilliflorus* GLOV. Bois de Nefles, Ste. Clotilde, 17.9.1973, *Cucumis sativus*. La Bretagne, 17.9.1973. Ste. Marie, 19.1.1975, *Callophyllum* sp. Foret de Beboar, 27.11.1975, *Senecio ambavilla*. Cambaie, 2.6.1977, *Cucumis* sp. Moufia, 18.6.1977, *Hibiscus sadbariffa*. Cilaos, 9.8.1973, *Sida* sp.

Aphis nerii B.d.F.: La Chaloupe, 22.1.1970, *Gomphocarpus cornutus*.

Aphis sp.: Cilaos, 13.9.1973, *Waltheria americana*. St. Leu, 4.10.1973.

Brachycaudus helichrysi KALT.: La Roche Ecrite, alt. 2777 m, 18.11.1973, *Senecio salicifolius*. Les Colimacons, alt. 800 m, 16.10.1975, *Centaurea* sp. Riviere St.Erienne, 4.10.1973, *Ageratum conyzoides*. Dtto, 4.10.1973, *Gnaphalium lutes-album*. Moufia, 23.8.1973, *Gynura* sp.

Lipaphis erysimi KALT.: Cambuston, 12.9.1973, *Brassica oleracea europea*. Salazie, 6.9.1973, *Brassica sinensis* (STARÝ & al. 1977).

Myzus persicae SULZ.: Les Colimacons, alt. 800 m, 17.3.1977, *Solanum tuberosum*. Cambuston, 13.6.1978, *Capsicum frutescens*.. Dtto, 30.9.1973, *Chenopodium antheminticum*. Dtto, 9.10.1973, *Solanum nigrum*.

Rhopalosiphum maidis FITCH: Cambuston 12.9.1973, *Panicum maximum*. La Bretagne, 17.8.1973, *Zea mays*.

Toxoptera aurantii B.d.F.: Salazie, 12.9.1973, *Citrus aurantium amara*. Bellepierre, 15.8.1971, *Schinus terebinthifolius* (STARÝ & al. 1973, as *A. platensis* BR.)

Toxoptera sp.: (QUILICI & al. 1988). aphids: St. Denis, Bois de Nefle, 12.8.1982, agrumes (leg. Quilici, IRAT). Moufia, 12.8.1982 (leg. Quilici, IRAT)

Aphidius matricariae HALIDAY

Brachycaudus helichrysi KALT.: Bras.Panon, 16.10.1977, *Crotalaria* sp.

***Aphidius rosae* HALIDAY**

Macrosiphum rosae L.: Entre Deux, 23.8.1973, *Rosa* sp. (STARY & al. 1977).

***Diaeretiella rapae* (M'INTOSH)**

Brevicoryne brassicae L.: "La Reunion", 1973.

Lipaphis erysimi KALT.: "La Reunion", 8.6.1977, *Brassica*. Les Colimacons, alt. 800 m, 16.10.1975, *Cheiranthus cheiri*. Les Hts. du Gillaume St. Paul, 8.7.1975, *Brassica* sp. Cilaos, 13.9.1973, *Brassica sinensis*. Cambuston, 12.9.1973, *Senebiera didyma*. Dtto, 12.9.1973, *Brassica oleracea europaea*. Salazie, 6.9.973, *Brassica sinensis* (also QUILICI & al. 1988).

Myzus persicae SULZ.: (QUILICI & al. 1988). aphids: Piton Hyacinthe, 7.10.1982, *Solanum tuberosum*, (leg. Quilici, IRAT). Petit France, 5.6.1982 (leg. Quilici, IRAT).

Host – Parasitoid associations

Aphis craccivora – Aphidius colemani.
Aphis gossypii – Aphidius colemani.
Aphis nerii – Aphidius colemani.
Aphis sp. *– Aphidius colemani.*
Brachycaudus helichrysi – Aphidius colemani, Aphidius matricariae.
Brevicoryne brassicae – Diaeretiella rapae.
Lipaphis erysimi – Aphidius colemani, Diaeretiella rapae.
Macrosiphum rosae – Aphidius rosae.
Myzus persicae – Aphidius colemani, Diaeretiella rapae.
Rhopalosiphum maidis – Aphidius colemani.
Sitobion sp *– Aphidius camerunensis.*
Toxoptera aurantii – Aphidius colemani.
Toxoptera sp *– Aphidius colemani.*

Faunal relationships

The parasitoid species found in the Reunion Island can be divided into several groups, as follows

None of the species is endemic to the Island.

Diaeretiella rapae is a species of palearctic origin, which has become widerspread and cosmopolitan in distribution.

Aphidius matricariae is a similar case, although its distribution is of a lesser range.

Aphidius rosae is also a palearctic species, which has become accidentally introduced in many parts of the world namely due to its association with *Macrosiphum rosae* on roses.

Aphidius camerunensis and *Aphidius colemani* are the dominant species in the ethiopian region (see STARÝ, REMAUDIÈRE & AUTRIQUE 1985); of them, *A. colemani* is a pan.-tropical presumably oriental in origin (STARÝ 1975).

TARDIEUX & RABASSE (1988) proved the occurrence of an apparently peculiar strain of *Aphidius colemani* in Reunion Island. They also exported a population of this parasitoid from Reunion Island for hybridization tests in the laboratory (on *Myzus persicae*) in France.

The faunal relationships to the ethiopean region are apparent. The dispersal of the faunal elements by air streams and/or aphid-infested plants from the african mainland may be presumed. The closer relationships to the aphid parasitoid fauna of Madagascar cannot be determined as our respective knowledge is very poor: Of the two species known from Madagascar (GRANGER 1949), *Ephedrus persicae* FROG. (= *E. impressus* GRANGER 1949) is a holarctic species of cosmopolitan distribution, and *Aphidius seyrigi* GRANGER 1949 has not been found outside Madagascar yet.

Perspectives in biological control

Aphidius colemani and *Diaeretiella rapae* are apparently the key parasitoid species in Reunion Island. Of them, *A. colemani* is dominant in most of the host aphid species.

An analysis of the parasitoid spectrum as well as the composition of the pest aphid fauna indicates that in most cases the spectrum is represented by a single species, *Aphidius colemani*. This state should stimulate activities to supplement *A. colemani* by some other species through introduction.

Some species of *Lysiphlebus*, namely *L. testaceipes* CRESS. might be promissive (see STARÝ, REMAUDIÈRE, AUTRIQUE 1985). Too, the composition of the pest aphid fauna indicates that biocontrol might become multilateral in that several aphid species fall within the host range of the same parasitoid species. On the other hand, all the aphid species found to be parasitised in Reunion Island are not indigenous but widely distributed species, so that there is no risk of possibly adverse effects of introduced parasitoids to the indigenous aphid fauna.

References

GRANGER, C. (1949): Braconides de Madagascar. — Mém. Inst. scient. Madagascar, Sér. A. **2**: 1-428.

QUILICI S., LECLANT F., DELVARE G. & B. VERCAMBRE (1988): Aphids and their natural enemies of Reunion Island: A review and new observations, pp. 111-117. — in NIEMCZYK E. & A.F.G. DIXON (Eds), Ecology and effectiveness of Aphidophaga. SPB Academic Publishing, The Hague.

REMAUDIÈRE G. & A. AUTRIQUE (1985): Contribution à l'ecologie des aphides africains. — FAO Misc. Paper No. AGPP/Misc./40: 214pp.

STARÝ P. (1975): *Aphidius colemani* VIERECK: its taxonomy, distribution and host range (Hymenoptera, Aphidiidae). — Acta Entomol. Bohemoslov. **72**: 156-163.

STARÝ P., REMAUDIÈRE G. &. A. AUTRIQUE (1985): Les aphidiides parasites de pucerons en region ethiopienne, pp. 95-102, — in REMAUDIÈRE G. & A. AUTRIQUE 1985.

STARÝ P., REMAUDIÈRE G. & F. LECLANT (1973): Nouvelles donnees sur les aphidiides de France (Hym.). — Annls. Soc. ent. Fr., N.S. **9**: 309-329.

STARÝ P. (1977): Nouveaux complements sur les aphidiides (Hym.) de France et leurs hotes. — Annls. Soc. ent. Fr., N.S. **13**: 165-181.

TARDIEUX I. & J.M. RABASSE (1988): Induction of a thelytokous reproduction in the *Aphidius colemani* (Hym., Aphidiidae) complex. — J. Appl.**106**: 58-61.

Adresses of the authors:

Petr STARÝ,
Institute of Entomology, Czech Academy of Sciences, Branišovská 31, CZ-370 05 Ceske Budějovice,
Czech Republic.

Georges REMAUDIÈRE,
Laboratoire d 'Entomologie, Museum national de l'Histoire naturelle, 45 Rue de Buffon, F-75005 Paris, France.

Jacques ETIENNE,
I.N.R.A., Station de Zoologie et de Lutte Biologique, Domain Duclos, Petit-Bourg, Guadeloupe.