

A. PANIS

Hymenopteran parasitoids of *Saissetia oleae* (Olivier) (Homiptera, Coccidae) and associated insects in southern France

Abstract - Hymenopteran parasitoids of *Saissetia oleae* (Homiptera, Coccidae), 17 other scale insect species nearby (mostly Coccidae), and of insects associated with these scale infestations, were studied at 210 sample localities in southern France for over 20 years. Most of the 47 parasitoids were Chalcidoidea but a few Ceraphronoidea, Ichneumonoidea and Proctotrupoidea were also found. *Saissetia oleae* was associated with predators and detritivores feeding on honeydew, sooty mould and scale debris. The scale host-plants surveyed were citrus, olive, oleander and maquis vegetation. A table is provided, listing the parasitoid species found, identities of their hosts and associated host-plants, the host life cycle stages parasitised, the number of parasitoid generations per year, and distribution (which was related to winter cold-hardiness).

Key words: Scale insect, parasitoid, predator, detritivore, France.

INTRODUCTION

The Mediterranean black scale, *Saissetia oleae* (Olivier) (Homiptera, Coccidae), is univoltine in southern France. It is a serious pest of citrus, olive and oleander in spite of the presence of parasitoids, including species also reported from other Mediterranean countries (Pellizzari, 1997). This study commenced in 1968, documenting the hymenopteran parasitoids of *S. oleae*, of other scale insect species found nearby (mostly also Coccidae), and of associated predators and detritivores. Predators of the black scale were documented by AlRouechdi & Panis (1981) and Panis (1999).

Between 1969 and 1983, species of *Metaphycus* parasitoid were introduced to regulate *S. oleae* populations; the last species introduced was *M. lounsburyi* (Howard). Most of the introduced parasitoid species established, but their numbers were greatly reduced by a cold winter in 1984. The study continued to accumulate parasitoid information throughout this period and on to 1988; further data was subsequently gathered in 1998-1999.

METHODS

The 210 sampling sites were selected to represent various microclimatic conditions for *S. oleae* on cultivated citrus, olive, oleander and natural Mediterranean maquis vegetation. Hymenopteran parasitoids of *S. oleae* and nearby associated insects were observed in the field. Samples of host-plants infested with *S. oleae* or with one of 18 other species of scale insects found in proximity with *S. oleae*, along with associated predators feeding both on one of the scale insects and *S. oleae* and detritivores on *S. oleae*, were kept in laboratory cages to document the parasitoids that emerged. Individual parasitised hosts were isolated in gelatine capsules to establish parasitoid-host associations. Parasitised hosts were dissected also to observe secondary parasitism.

RESULTS

The findings are summarised in Table 1. The table lists 47 hymenopteran parasitoid species and the host-parasitoid relationships, host life cycle stages parasitised, yearly number of generations, and distribution data obtained for each of them. The 18 host scale insect species (16 Coccidae, 1 Eriococcidae and 1 Lecanodiaspididae) studied, and their host-plants (citrus, olive, oleander and maquis vegetation) are also listed, together with the identity of *S. oleae*-associated predators and detritivores.

DISCUSSION

Of the 47 parasitoids identified, 20 were primary or secondary parasitoids of *S. oleae*; 12 of the primary and 3 secondary parasitoids also attacked one or more of the other 17 scale insect species in the study. Four of the primary parasitoids of *S. oleae* were host-specific (*Metaphycus anneckeii*, *M. hageni*, *M. lounsburyi* and *M. nadius* (Encyrtidae)). *Metaphycus nadius* is a new parasitoid record for *S. oleae*; previous records of this parasitoid are from other scale insect species elsewhere in Europe. Other new parasitoid records on *S. oleae* are *Eupelmus urozonus*, *Scutellista obscura* and *Marietta picta*. *E. urozonus* contributes to guilds of a cynipid on oak, of the olive fly, the olive moth and many predatory and detritivorous lacewings on olives. The detritivorous hosts of *Alaptus auranti* and *A. minimus* are the first identified psocid hosts for these oophagous Hymenoptera.

In conclusion, the hymenopterous assemblages on citrus, olive, oleander and Mediterranean maquis vegetation show relationships within the same locality between guilds of Coccidae; between *S. oleae* guilds and those of two olive insects; and on olives, between some predator and detritivore guilds of *S. oleae*.

(Table 1. continued)

Hymenoptera species (family)	Other hosts in the scale localities (order, family)	Observations on <i>S. oleae</i> - hymenoptera relationships
10 - <i>Metaphycus helvolus</i> (Compere)	<i>C. hesperidum</i> , <i>Coccus pseudomagnoliarum</i> (Kuwana), <i>Protopulvinaria</i> <i>pyriformis</i> (Cockerell)*, <i>P. mesembryanthemi</i> (Vallot)* (Coccidae)	endo. Ny2, Ny3; 3 to 5 gen.; citrus, maquis, oleander, olive; everywhere
11 - <i>Metaphycus lounsburyi</i> (Howard)		endo. Ny3, young Ad, ov.Ad, old Ad; 2 to 3 gen.; oleander, olive, coast. Corsica, Languedoc, Provence, Roussillon
12 - <i>Metaphycus nadius</i> (Walker)*		endo. Ny3; -; maquis; Corsica
13 - <i>Metaphycus swirskii</i> Annecke & Mynhardt	<i>P. pyriformis</i> , <i>P. floccifera</i> * (Coccidae)	endo. Ny3, young Ad; -; oleander; Alpes-Maritimes, Var : Fayence, Montauroux, Seillans
14 - <i>Moranila californica</i> (Howard) (Pteromalidae)	<i>C. rusci</i> , <i>C. sinensis</i> (Coccidae)	ecto. egg; 3 gen.; citrus, oleander, olive; Alpes-Maritimes, Var : Ollioules, Sanary
15 - <i>Scutellista caerulea</i> (Fonscolombe) (Pteromalidae)	<i>C. floridensis</i> , <i>C. japonicus</i> Green*, <i>C. rusci</i> , <i>C. hesperidum</i> (Coccidae)	ecto. Ny2, Ny3, young Ad, egg; 2 to 4 gen.; citrus, maquis, oleander, olive; everywhere
16 - <i>Scutellista nigra</i> (Mercet)	<i>C. rusci</i> * (Coccidae), <i>Lecaniodiaspis</i> <i>sardoa</i> (Targioni Tozzetti) (Hemiptera, Lecanodiaspididae)	ecto. egg; -; maquis, olive; -; Corsica, Alpes-Maritimes, Var, Aude : Laure-Minervois, Pyrénées- Orientales : Argelès-sur-Mer
17 - <i>Scutellista obscura</i> (Förster)*	<i>P. corni</i> , <i>P. mesembryanthemi</i> * (Coccidae)	ecto.egg; -; Alpes-Maritimes : Antibes, Hérault : Ceyras, Nébian
Secondary parasitoids		
18 - <i>Baryscapus</i> <i>ceroplastophilus</i> (Domenichini) (Eulophidae)	<i>Scutellista caerulea</i> * on <i>S. oleae</i> , <i>Apros-tocetus toddaliae</i> on <i>C.</i> <i>rusci</i> , <i>C. sinensis</i>	endo. Ny, pupa; -; citrus, maquis, olive; Corsica : San Giuliano, San Nicolao, Alpes-Maritimes : Antibes Saint Laurent-du-Var
(6) - <i>Eupelmus urozonus</i> Dalman* (Eupelmidae)	<i>Scutellista caerulea</i> on <i>S. oleae</i> , <i>Mesopolobus tibialis</i> (Westwood)* (Pteromalidae) on <i>Andricus kollari</i> (Hartig) (Hym., Cynipidae)	ecto. Ny, pupa; -; citrus, olive; Corsica : San Giuliano, Alpes- Maritimes : Antibes, Breil-sur-la- Roya, Var : Sanary, Seillans
19 - <i>Marietta picta</i> (André)* (Aphelinidae)	<i>Metaphycus lounsburyi</i> , <i>Scutellista</i> <i>caerulea</i> on <i>S. oleae</i> , on ? <i>Eriococcus. ericae</i> (Hem., Eriococcidae), <i>Aschitus triozae</i> (André) (Encyrtidae) on <i>Trioxa</i> <i>centranthi</i> (Vallot) (Hem., Triozidae)	ecto. Ny, pupa, endo. Ny1, Ny2 in winter; -; citrus, maquis, olive; Corsica : San Giuliano, Alpes- Maritimes : Utelle

Table 1 - Hymenopteran species parasitising the Mediterranean Black Scale, *Saissetia oleae* (Olivier), other nearby scale insects, and associated scale predators and detritivores in France.

Hymenoptera species (family)	Other hosts in the scale localities (order, family)	Observations on <i>S. oleae</i> - hymenoptera relationships
Primary parasitoids		
1 - <i>Aprostocetus toddaliae</i> (Risbec)* (Eulophidae)	<i>Ceroplastes floridensis</i> Comstock, <i>Ceroplastes rusci</i> (L.), <i>Ceroplastes sinensis</i> Del Guercio (Hemiptera, Coccidae)	endo. Ny2, Ny 3, young Ad; 3 gen.; citrus, maquis; coast. Corsica, Alpes-Maritimes: Saint Laurent-du-Var
2 - <i>Coccophagus cowperi</i> Girault (Aphelinidae)	<i>C. rusci</i> , <i>Coccus hesperidum</i> L. (Coccidae)	endo. Ny2, Ny3; 3 gen.; citrus, maquis; coast. Corsica
3 - <i>Coccophagus lycimnia</i> (Walker)	<i>C. rusci</i> , <i>C. sinensis</i> , <i>C. hesperidum</i> , <i>Eucalymnatus tessellatus</i> (Signoret)*, <i>Lichtenia viburni</i> (Signoret)*, <i>Neopulvinaria innumerabilis</i> (Rathvon), <i>Pulvinaria floccifera</i> (Westwood), <i>Pulvinaria hydrangeae</i> Steinweden* (Coccidae)	endo. Ny2, Ny3; 3 to 4 gen.; citrus, maquis, oleander, olive; everywhere
4 - <i>Coccophagus pulchellus</i> Westwood	<i>C. hesperidum</i> , <i>Filippia follicularis</i> (Targioni Tozzetti), <i>L. viburni</i> (Coccidae)	endo. Ny2, Ny3; 2 gen.; olive; Alpes-Maritimes : Antibes, Var : Fayence, Pyrénées-Orientales : Laroque-des-Albères
5 - <i>Coccophagus semicircularis</i> (Förster)	<i>C. hesperidum</i> , <i>L. viburni</i> *, <i>N. innumerabilis</i> *, <i>Parthenolecanium corni</i> (Bouché), <i>Pulvinariella mesembryanthemi</i> (Vallot) (Coccidae)	endo. Ny2, Ny3; 2 gen.; oleander, olive; Alpes-Maritimes
6 - <i>Eupelmus urozonus</i> Dalman* (Eupelmidae)	<i>Bactrocera oleae</i> (Gmelin) (Diptera, Tephritidae)	ecto. Ny2, Ny3; -; citrus; Corsica : San Giuliano
7 - <i>Metaphycus annekei</i> Guerrieri & Noyes (Encyrtidae)		endo. Ny3, young Ad, ov.Ad; 3 gen.; olive; Var : Ollioules, Sanary, Pyrénées-Orientales: Argelès-sur-Mer
8 - <i>Metaphycus flavus</i> (Howard)	<i>C. hesperidum</i> , <i>P. floccifera</i> , <i>P. mesembryanthemi</i> * (Coccidae)	endo. Ny2; 2 gen.; citrus, maquis oleander, olive; everywhere
9 - <i>Metaphycus hageni</i> Daane & Caltagirone		endo. Ny3, young Ad, ov.Ad; -; maquis, olive; coast. Corsica, Aude : Fitou, Lapalme, Roquefort- des-Corbières, Treilles, Pyrénées- Orientales : Argelès-sur-Mer, Collioure, Laroque-des-Albères

(Table 1. continued)

Hymenoptera species (family)	Other hosts in the scale localities (order, family)	Observations on <i>S. oleae</i> - hymenoptera relationships
20 - <i>Pachyneuron concolor</i> (Förster)* (Pteromalidae)	<i>Metaphycus annekei</i> , <i>hageni</i> , <i>lounsburyi</i> , <i>nadius</i> on <i>S. oleae</i> , <i>Scutellista caerulea</i> on <i>C. rusci</i> , <i>Microterys nietneri</i> Motschulsky) (Encyrtidae) on <i>C. hesperidum</i> , <i>Microterys hortulanus</i> Erdös on <i>Sphaerolecanium prunastri</i> (Fonscolombe) (Coccidae)	ecto. Ny; -; citrus, maquis, olive; Corsica : San Giuliano, Alpes- Maritimes : Antibes, Valbonne, Vallauris
Primary parasitoids of the black-scale predators		
21 - <i>Apanteles glomeratus</i> (L.) (Braconidae)	<i>Eublemma scitula</i> (Rambur) (Lepidoptera, Noctuidae) on <i>S.</i> <i>oleae</i> ; on <i>Prays oleae</i> Bernard (Lepidoptera, Yponomeutidae)	L. pr. egg, crawler; 1-endo. Ny1- Ny3, 1-ecto. Ny4; -; maquis, olive; Corsica, Provence, Languedoc
22 - <i>Aphanogmus fumipennis</i> Thomson (Ceraphronidae)	<i>Lestodiplosis</i> sp.* (Diptera, Cecidomyiidae) on <i>S. oleae</i> and mites on sooty mould	L. pr. Ny1; 1-endo. Ny; -; citrus, olive; Corsica, Provence
23 - <i>Aphanogmus steinitzi</i> Panzer	<i>Coniopteryx borealis</i> Tjeder* (Neuroptera, Coniopterygidae) on <i>S. oleae</i> and mites on sooty mould	L. pr. Ny1, Ny2; 1-endo. Ny; -; citrus, maquis; Corsica : San Giuliano
24 - <i>Aprostocetus neglectus</i> (Domenichini) (Eulophidae)	<i>Chilocorus bipustulatus</i> (L.), <i>Exochomus quadripustulatus</i> (L.) (Coleoptera, Coccinellidae) on <i>S. oleae</i>	L., Ad pr. crawler, Ny1, Ny2; 1- endo. Ny4, pupa; -; citrus, olive; Corsica, Provence
25 - <i>Baryscapus impeditus</i> (Nees) (Eulophidae)	<i>Chrysoperla carnea</i> (Stephens) (Neuroptera, Chrysopidae) on <i>S.</i> <i>oleae</i> and <i>P. oleae</i> (Yponomeutidae)	Ad pr. crawler; 1-endo. pupa; -; olive; Provence
26 - <i>Chrysopophthorus</i> <i>hungaricus</i> Zilahi-Kiss (Braconidae)	<i>Ch. carnea</i> , <i>Chrysoperla lucasina</i> (Lacroix)* (Chrysopidae) on <i>S. oleae</i> and <i>P. oleae</i> (Yponomeutidae)	Ad pr. crawler; 1-endo. Ad; -; olive; Provence
27 - <i>Dendrocerus halidayi</i> (Curtis) (Megaspilidae)	<i>Coniopteryx borealis</i> * (Coniopterygidae) on <i>S. oleae</i> and mites on sooty mould	L. pr. Ny1, Ny2; 1-endo. Ny; citrus, maquis; Corsica
28 - <i>Eupelmus annulatus</i> (Nees) (Eupelmidae)	<i>Ch. carnea</i> (Chrysopidae) on <i>S.</i> <i>oleae</i> and <i>P. oleae</i> (Yponomeutidae)	Ad pr. crawler; 1-ecto. Ny3; -; olive; Var : Le Luc-en-Provence
29 - <i>Gelis ilicicolator</i> Aubert (Ichneumonidae)	<i>Ch. carnea</i> (Chrysopidae) on <i>S. oleae</i> and <i>P. oleae</i> (Yponomeutidae)	Ad pr. crawler; 1-ecto. Ny3, pupa; -; olivier; Var : Le Luc-en-Prov.
30 - <i>Helorus meridionalis</i> (Pschörn-Walcher) (Heloridae)	<i>Ch. carnea</i> (Chrysopidae) on <i>S.</i> <i>oleae</i> and <i>P. oleae</i> (Yponomeutidae)	Ad pr. crawler; 1-ecto. Ny3; - olivier; Var : Le Luc-en-Provence
31 - <i>Helorus ruficornis</i> Förster		

(Table 1. continued)

Hymenoptera species (family)	Other hosts in the scale localities (order, family)	Observations on <i>S. oleae</i> - hymenoptera relationships
32 - <i>Homalotylus flaminus</i> (Dalman) (Encyrtidae)	<i>Ch. bipustulatus</i> , <i>E. quadripustulatus</i> (Coccinellidae) on <i>S. oleae</i>	L., Ad pr. crawler, Ny1, Ny2; 1- endo. Ny4, pupa; -; citrus, olive; everywhere
33 - <i>Isodromus flaviscutum</i> Hoffer & Trjapitzin (Encyrtidae)	<i>Ch. carnea</i> , <i>Ch. lucasina</i> * (Chrysopidae) on <i>S. oleae</i> and <i>P. oleae</i> (Yponomeutidae)	Ad pr. crawler; 1-endo. Ny2, Ny3; -; citrus, olive; Provence
34 - <i>Oomyzus sempronius</i> (Erdős) (Eulophidae)	<i>Ch. carnea</i> , <i>Ch. lucasina</i> * (Chrysopidae) on <i>S. oleae</i> and <i>P. oleae</i> (Yponomeutidae)	Ad. pr. crawler; 1-endo. Ny2, Ny3 ; -; olive; Var : Le Luc-en-Prov.
35 - <i>Telenomus acrobates</i> Giard (Scelionidae)	<i>Ch. carnea</i> (Chrysopidae) on <i>S. oleae</i> and <i>P. oleae</i> (Yponomeutidae)	Ad pr. crawler; 1-endo. egg; -; olive; everywhere
Secondary parasitoids of the black-scale predators		
36 - <i>Catolaccus crassipes</i> (Masi) (Pteromalidae)	undetermined Ichneumonidae on <i>Ch. carnea</i> on <i>S. oleae</i> and <i>Prays oleae</i>	Ad pr. crawler; 1- ?; 2- ?; -; olive; Var : Le Luc-en-Provence
37 - <i>Dibrachys cavus</i> (Walker) (Pteromalidae)	undetermined ectoparasitoid on <i>Ch. carnea</i> on <i>S. oleae</i> and <i>P. oleae</i> (Yponomeutidae)	Ad pr. crawler; 1-ecto. -; 2-endo. -; -; olive; Var : Le Luc-en-Provence
38 - <i>Dibrachys lignicola</i> Graham		
39 - <i>Dichrogaster aestivalis</i> (Gravenhorst) Ichneumonidae)	<i>Gelis ilicicolator</i> (Ichneumonidae) on <i>Ch. carnea</i> on <i>S. oleae</i> and <i>Prays oleae</i>	Ad pr. crawler; 1-ecto. Ny3, pupa; 2-endo. -; -; olive; Var : Le Luc-en- Provence
40 - <i>Dichrogaster perlae</i> Doumerc		
41 - <i>Elasmus steffani</i> Viggiani (Elasmidae)	<i>Apanteles glomeratus</i> (Braconidae) on <i>Eulemma scitula</i> (Noctuidae) and <i>P. oleae</i>	L. pr. egg, crawler; 1-ecto.; 2-ecto. Ny4, pupa; -; olive; Provence
(28) - <i>Eupelmus annulatus</i> (Nees) (Eupelmidae)	<i>Isodromus flaviscutum</i> (Encyrtidae), <i>Baryscapus impeditus</i> (Eulophidae) on <i>Ch. carnea</i> on <i>S. oleae</i> and <i>Prays oleae</i>	Ad pr. crawler; 1-endo. Ny / pupa; 2-ecto. pupa; -; olive; Var : Le Luc- en-Provence
(6) - <i>Eupelmus urozonus</i> Dalman		
42 - <i>Mesopolobus mediterraneus</i> (Mayr) (Pteromalidae)	<i>Apanteles glomeratus</i> on <i>Eulemma scitula</i> (Noctuidae) and <i>Prays oleae</i> (Yponomeutidae)	L. egg, crawler; 1-endo Ny; 2-ecto. Ny; -; olive; Var : Le Luc-en- Provence
(20) - <i>Pachyneuron concolor</i> (Förster) (Pteromalidae)	<i>Homalotylus flaminus</i> (Encyrtidae) on <i>Exochomus quadripustulatus</i> (Coccinellidae) on <i>S. oleae</i>	L., Ad pr. crawler, Ny1, Ny2; 1- endo. Ny4, pupa; 2-ecto. Ny; -; citrus, olive; Corsica, Languedoc, Provence, Roussillon

(Table 1. continued)

Hymenoptera species (family)	Other hosts in the scale localities (order, family)	Observations on <i>S. oleae</i> - hymenoptera relationships
Primary parasitoids of the black-scale detritivores		
43 - <i>Alaptus auranti</i> (Mercet) (Mymaridae)	<i>Liposcelis meridionalis</i> Von Rosen* (Psocoptera, Liposcelidae)	L., Ad under dead Ad, old Ad, ov. Ad; 1-endo. egg; -; citrus; Corsica : San Giuliano
44 - <i>Alaptus minimus</i> Walker	<i>Graphopsocus cruciatus</i> (L.)* (Psocoptera, Stenopsocidae)	L. Ad s. mould; -; olive; Var : Le Luc-en-Provence, Sanary
(23) - <i>Aphanogmus steinitzi</i> Panzer (Ceraphronidae)	<i>Semidalis aleyrodiformis</i> (Stephens) (Neur. Coniopterygidae) on mites on sooty mould, on eggs of citrus aphids and <i>Dialeurodes citri</i> (Ashmead) (Hem., Aleyrodidae)	Ad honey.; 1-endo. Ny; -; citrus, maquis, olive; Corsica, Provence
(24) - <i>Aprostocetus neglectus</i> (Domenichini) (Eulophidae)	<i>Pullus subvillosus</i> (Göze) (Col. Coccinellidae) on citrus aphids	Ad honey.; 1-endo. pupa; -; citrus; Alpes-Maritimes
(25) - <i>Baryscapus impeditus</i> (Nees) (Eulophidae)	<i>Chrysoperla mediterranea</i> Hölzel*, <i>Dichochrysa flavifrons</i> (Brauer) (Neur. Chrysopidae) on citrus aphids	Ad honey. : 1-endo. pupa; -; citrus; Alpes-Maritimes
45 - <i>Cerchysiella laeviscutum</i> (Thomson) (Encyrtidae)	<i>Cryptophagus scanicus</i> L.* (Coleoptera, Cryptophagidae) on <i>S. oleae</i>	L., Ad under dead Ad, old Ad; 1- endo. Ny; -; citrus; Alpes- Maritimes : Saint Laurent-du-Var
(26) - <i>Chrysopophthorus</i> <i>hungaricus</i> (Zilahi-Kiss) (Braconidae)	<i>Chrysoperla mediterranea</i> *, <i>Dichochrysa flavifrons</i> (Chrysopidae) on eggs of <i>Prays</i> <i>oleae</i> (Yponomeutidae)	Ad honey.; 1-endo. Ad; -; olive; Alpes-Maritimes, Var
(27) - <i>Dendroceris halidayi</i> (Curtis) (Megaspilidae)	<i>Semidalis aleyrodiformis</i> * (Coniopterygidae) on mites on sooty mould	Ad honey.; 1-endo. Ny; -; olive; Var : Le Luc-en-Provence
(32) - <i>Helorus meridionalis</i> (Pschörn-Walcher) (Heloridae)	<i>D. flavifrons</i> , <i>Dichochrysa picteti</i> (McLa- chlan)*, <i>Dichochrysa</i> <i>prasina</i> (Burmeister) <i>Dichochrysa</i> <i>zelleri</i> (Schneider)* (Chrysopidae) on eggs of <i>Prays oleae</i>	Ad honey.; 1-ecto Ny3; -; olivier; Var : Le Luc-en-Provence
(34) - <i>Isodromus flaviscutum</i> Hoffer & Trjapitzin (Encyrtidae)	<i>D. flavifrons</i> , <i>D. prasina</i> , <i>D. zelleri</i> (Chrysopidae) on eggs of <i>Prays</i> <i>oleae</i>	Ad honey.; 1-endo. Ny; -; olive; Var : Le Luc-en-Provence
46 - <i>Isodromus vinulus</i> (Dalman) (Encyrtidae)	<i>Italo-chrysa italica</i> (Rossi) (Chrysopidae) on ?	Ad honey.; 1-endo. Ny; -; olive; Var : Le Luc-en-Provence
(35) - <i>Oomyzus sempronius</i> (Erdös) (Eulophidae)	<i>Dichochrysa flavifrons</i> , <i>D.</i> <i>prasina</i> * (Chrysopidae) on eggs of <i>Prays oleae</i>	Ad honey.; 1-endo. Ny; -; olive; Var : Le Luc-en-Provence