

**Biological control of fruit flies
by two parasitoids, *Fopius arisanus*
and *Diachasmimorpha longicaudata*
in French Polynesia**

Rudolph Putoa (French Polynesia)

November 2009

Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia

4 species of fruit flies present in French Polynesia



Polynesian fruit fly :
Bactrocera kirki



Queensland fruit fly :
Bactrocera tryoni

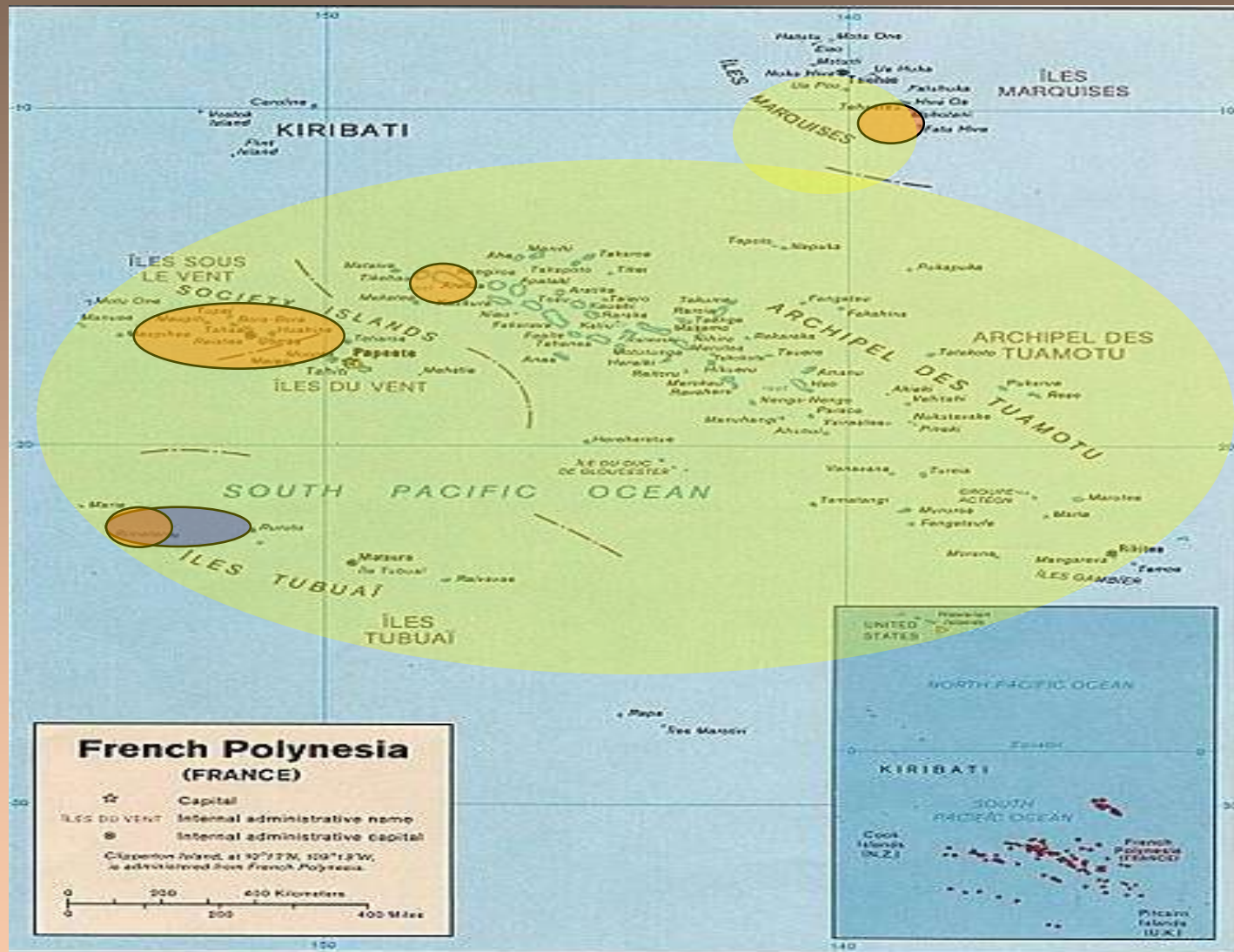


Oriental fruit fly :
Bactrocera dorsalis



Pacific fruit fly :
Bactrocera xanthodes

Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia



Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia

- *Fopius arisanus* : egg parasitoid



- introduced in Dec 2002 from Hawai'i
- 12 x 50,000 = 600,000 *F. arisanus* from Dec 2002 to Nov 2004
- 360,000 *F. arisanus* released over Tahiti, Moorea, Raiatea, Taha'a and Huahine
- first recovery from fruit survey in March 2003

Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia

Diachasmimorpha longicaudata : 3rd instar larva parasitoid



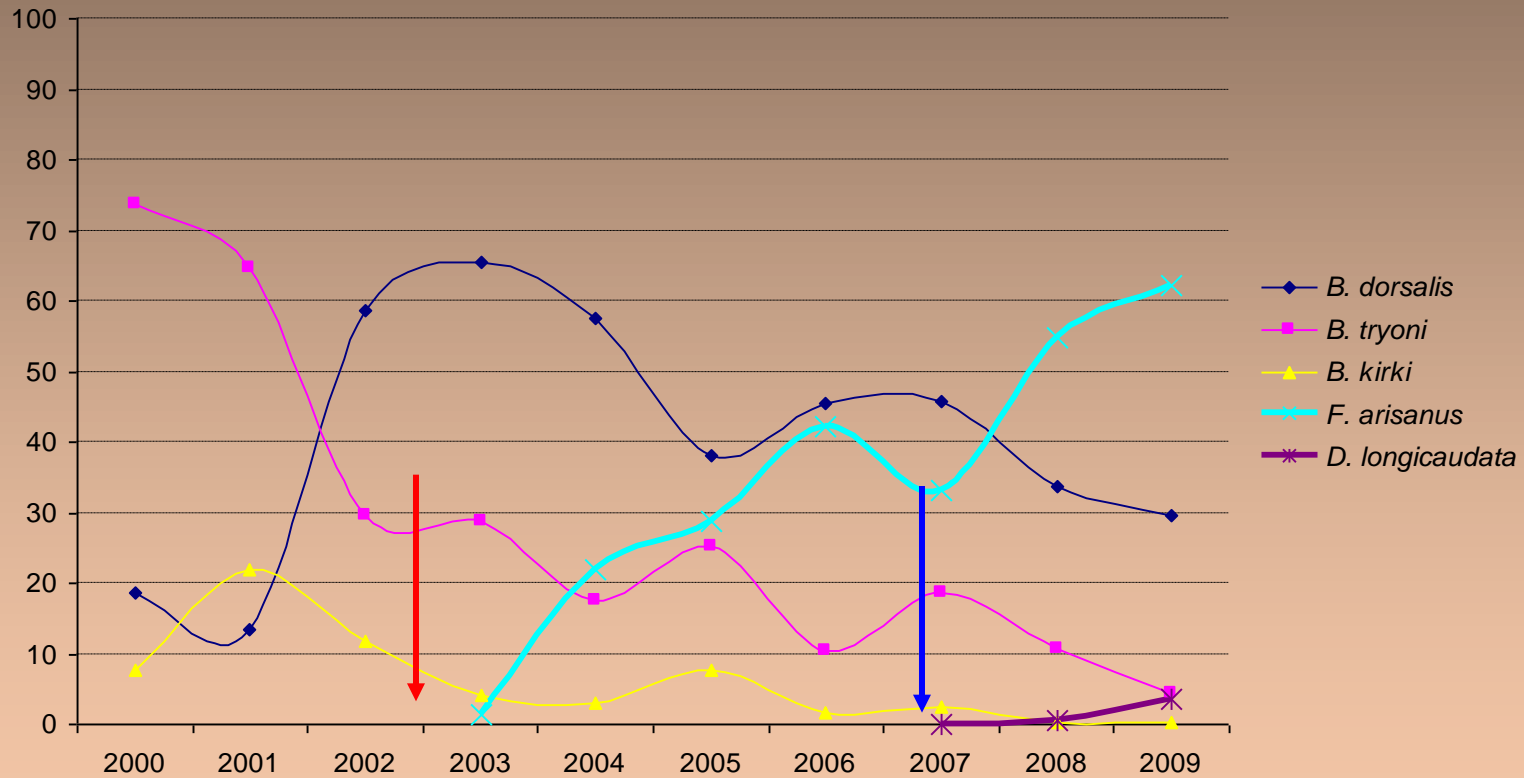
- introduced in Apr. 2007 from Hawai'i
- 5 x 9,000 = 45,000 *D. longicaudata* from Apr. 2007 to Aug. 2008
- 40,000 *D. longicaudata* released on Tahiti only
- first recovery from fruit survey in February 2008

Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia

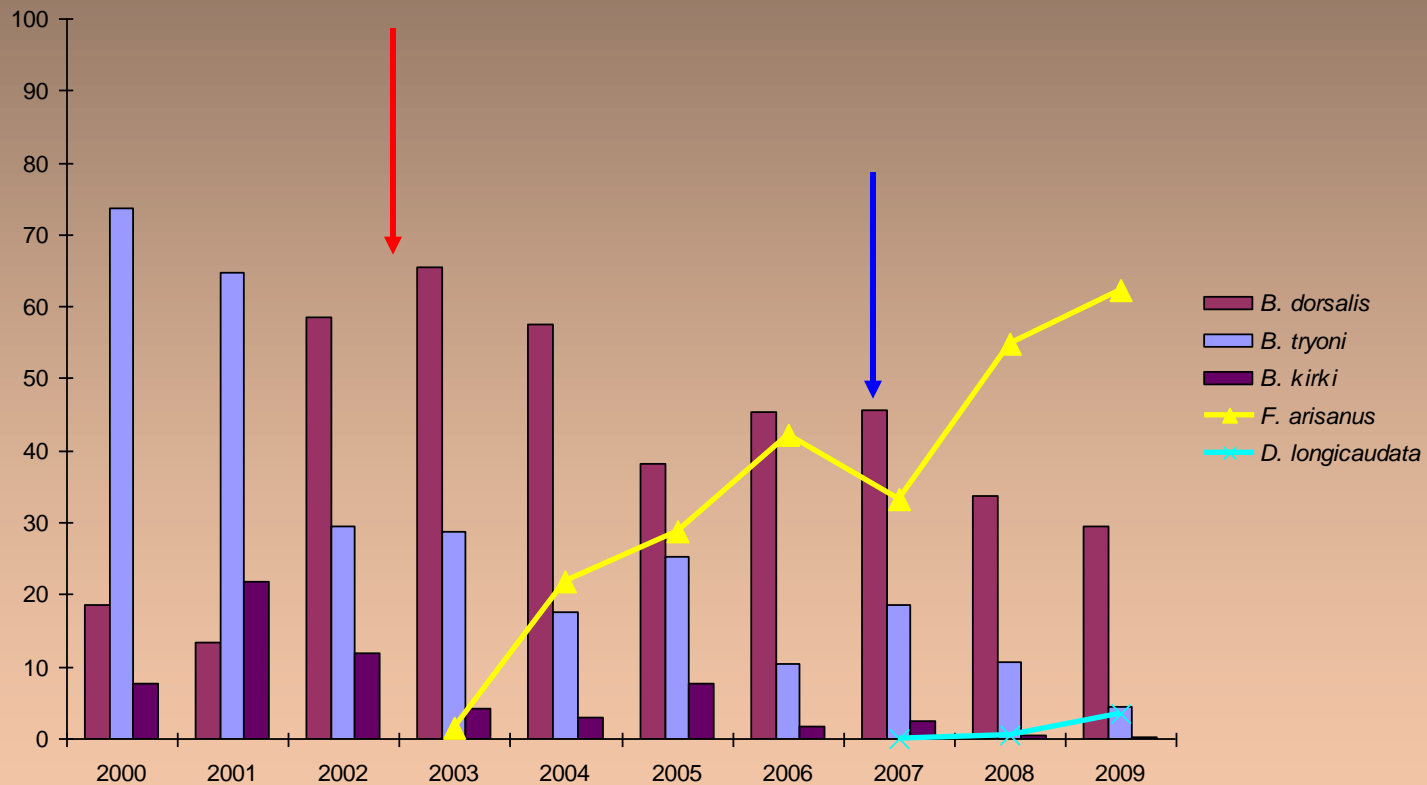
TAHITI	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009*
# fruits	3 007	440	4 520	10 249	6 116	8 042	13 045	10 738	15 200	6 736
Weight (kg)	366	67	520	861	616	539	1 020	859	1 301	427
# pupae	4 894	4 816	22 892	59 503	54 841	36 050	80 913	75 236	99 486	40 593
Emergence rate	73 %	53,3 %	65,7 %	66 %	62,1 %	61,8 %	62,5 %	59,2 %	58,7 %	53,5 %
% <i>B. dorsalis</i>	18,5	13,4	58,6	65,5	57,6	38,2	45,5	45,7	33,7	29,6
% <i>B. tryoni</i>	73,8	64,7	29,5	28,8	17,6	25,3	10,5	18,7	10,6	4,4
% <i>B. kirki</i>	7,7	21,9	11,9	4,2	2,9	7,6	1,7	2,4	0,4	0,2
% <i>F. arisanus</i>	-	-	-	1,5	21,9	28,9	42,3	33,2	54,8	62,3
% <i>D. longicaudata</i>	-	-	-	-	-	-	-	0	0,5	3,5
% <i>F. arisanus</i> (<i>Psidium guajava</i>)	-	-	-	2,1	31,8	37,5	51,9	40,1	66,9	73,6

* : first semester 2009

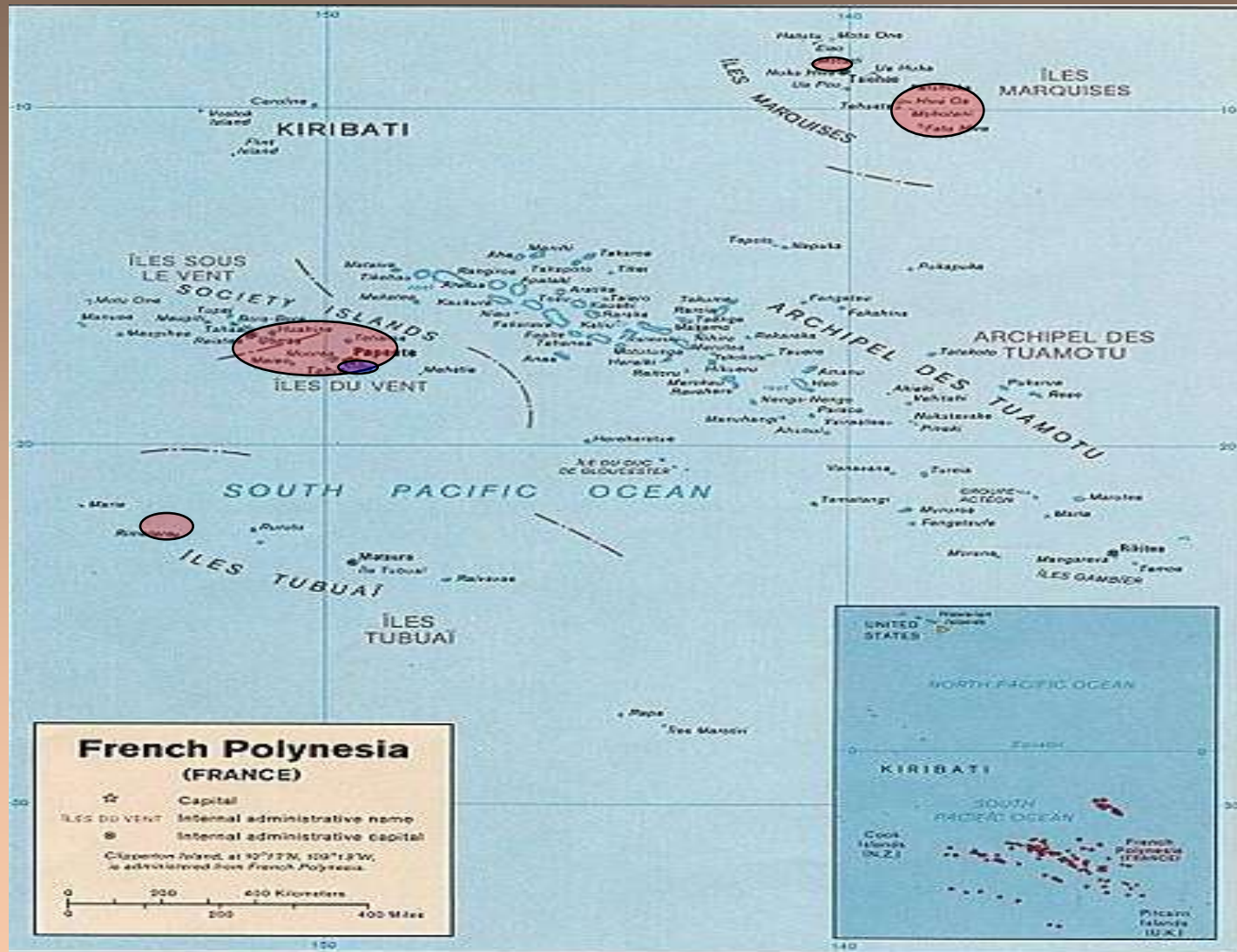
Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia



Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia



Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia

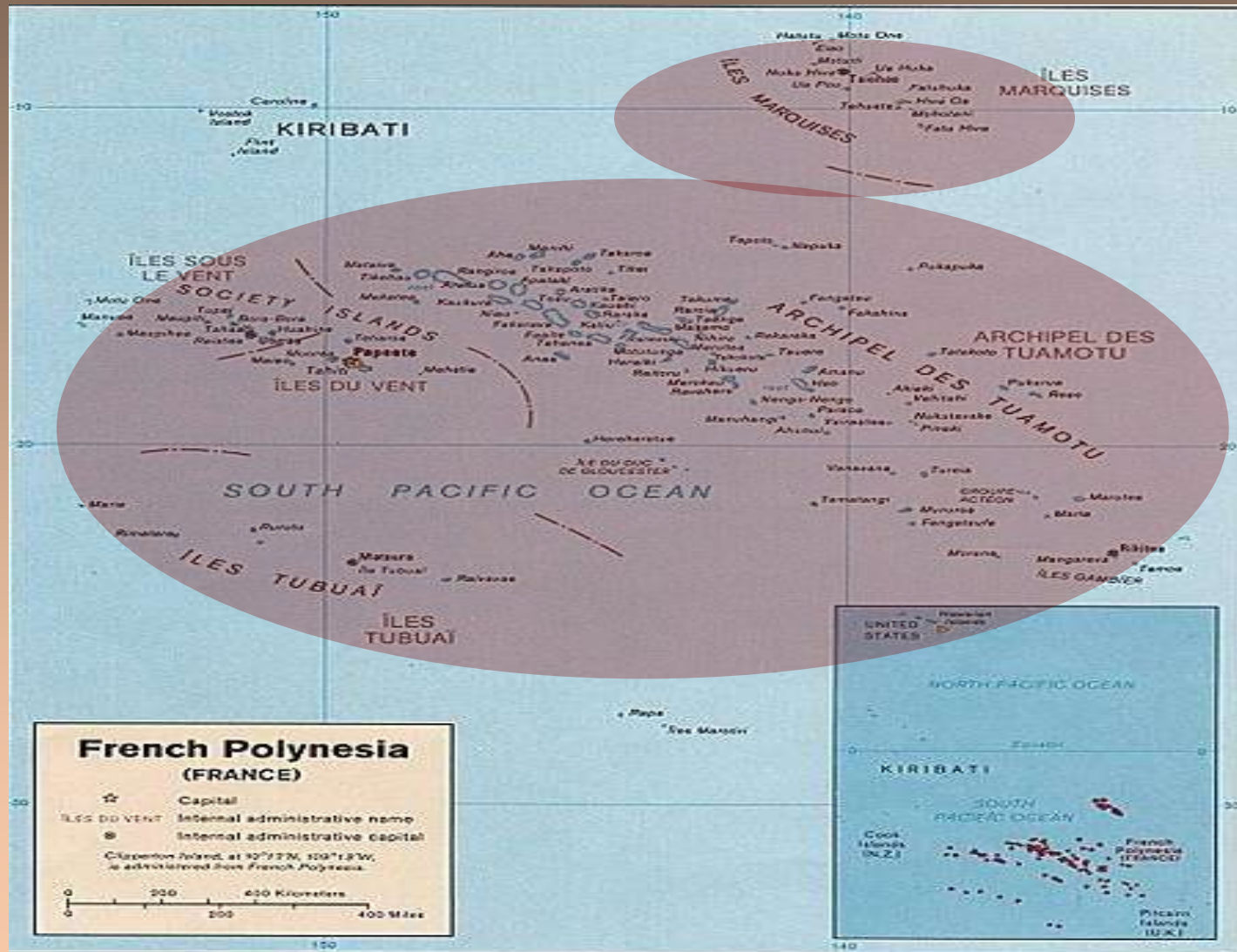


Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia

Model for introduction of *F. arisanus* to control :

- *Bactrocera carambolae* – South America
- *Bactrocera invadens* - Africa
- *Bactrocera zonata* – Africa, Indian Ocean region

Biological control of fruit flies by two parasitoids, *Fopius arisanus* and *Diachasmimorpha longicaudata* in French Polynesia



Maururu

e parahi ana'e

