

RESISTANCE- HISTORY AND CURRENT STATUS IN THE REGION

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HOST RANGE

Species	India	Pakistan	China
<i>H. armigera</i>	> 60 cultivated plant species	> 62 plant species maximum preference to chick pea	> 200 cultivated species, most preferred cotton and tomato
<i>H. peltigera</i>	<i>Carthamus tinctorius</i> , <i>C.oxycantha</i> , <i>C.lanatus</i> and <i>Helianthus annus</i>	Similar to India	-
<i>H. assulta</i>	<i>Datura metal.</i> <i>Nicotiana rustica</i> and <i>Datura innoxia</i>.	Similar to India	tobacco, tomato, capsicum
<i>H. viriplacca</i>	X	X	apple, clover
<i>H. dipsacea</i>	X	X	apple, clover
<i>H. ononis</i>	X	X	-
<i>H. fervens</i> <i>Butler</i>	-	-	-

HISTORY OF RESISTANCE DEVELOPMENT

India

- * Prior to 1978 *Earias vittella* and *E. insulana*- dominant & *H. armigera* rare.
- * 1978- 79 *S. litura*- serious to cotton in SI, heavy use of OP and OC started-
- * 1981 Synthetic pyrethroids for the control of *E. vittella* and *S. litura*, *P. gossypiella* – displacement by *H. armigera*

Pakistan

- * 1991 Favourable farming conditions and extensive and indiscriminate use of pesticides.
- * 1991- 1993 Moderate level of resistance detected to cypermethrin and cyfluthrin
- * 1996 and 1997 The low of resistance to zetacypermethrin and lambda cyhalothrin during 1994 and 1995 rose to very high levels during.

China

- * **1980** **The resistance to fenvalerate and deltamethrin was detected**

- * **1997-2002** **The development of resistance to other compounds like esfenvalerate, deltamethrin, cyhalothrin, fenpropathrin, methomyl methomyl, monocrotophos and phoxin**

**“Sustainable Control of the Cotton Bollworm
(*Helicoverpa armigera*) in small scale Cotton
Production Systems”**



ICAC



CFC



NRI

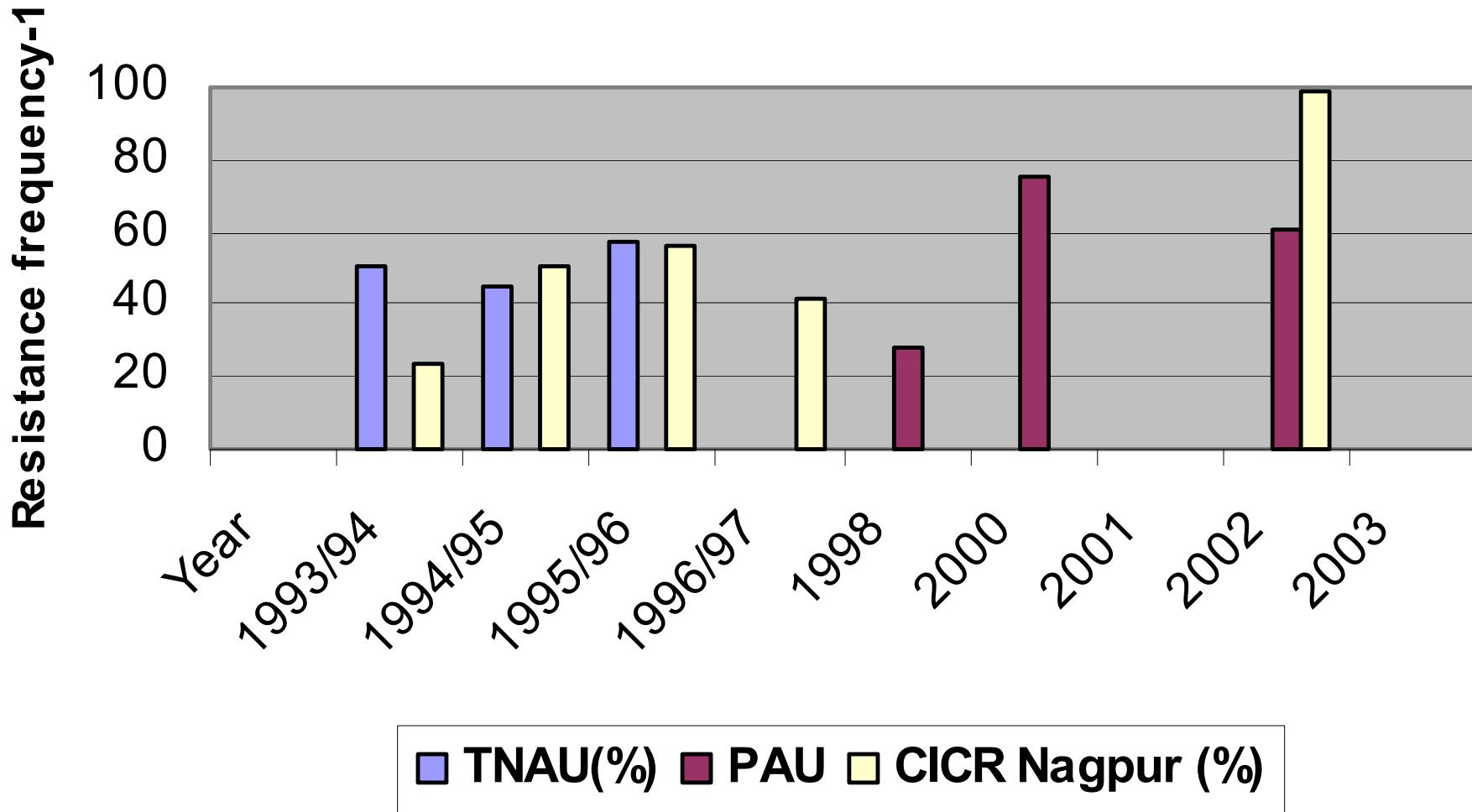


ICAR

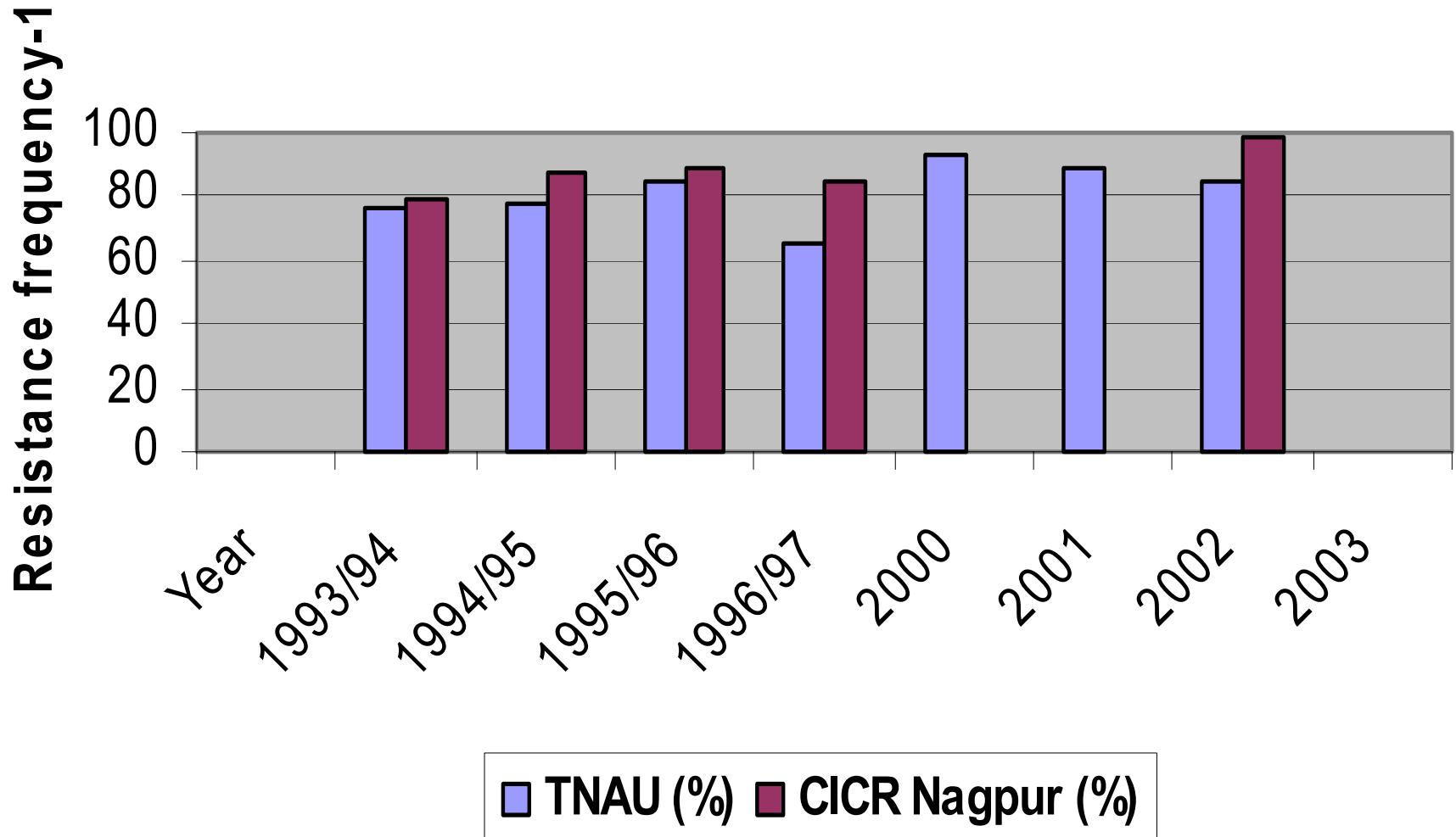


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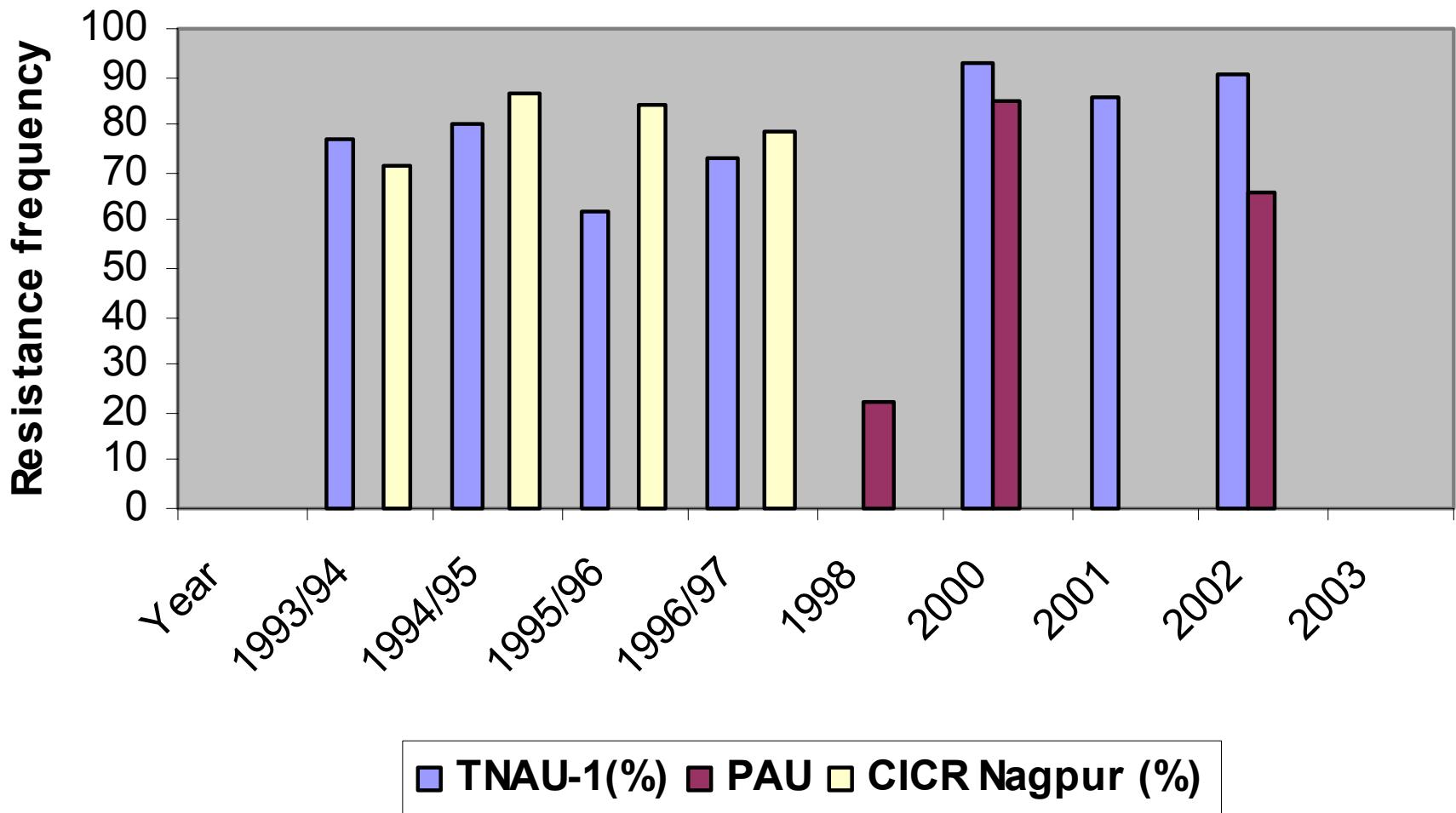
Cypermethrin (1.0 μ)



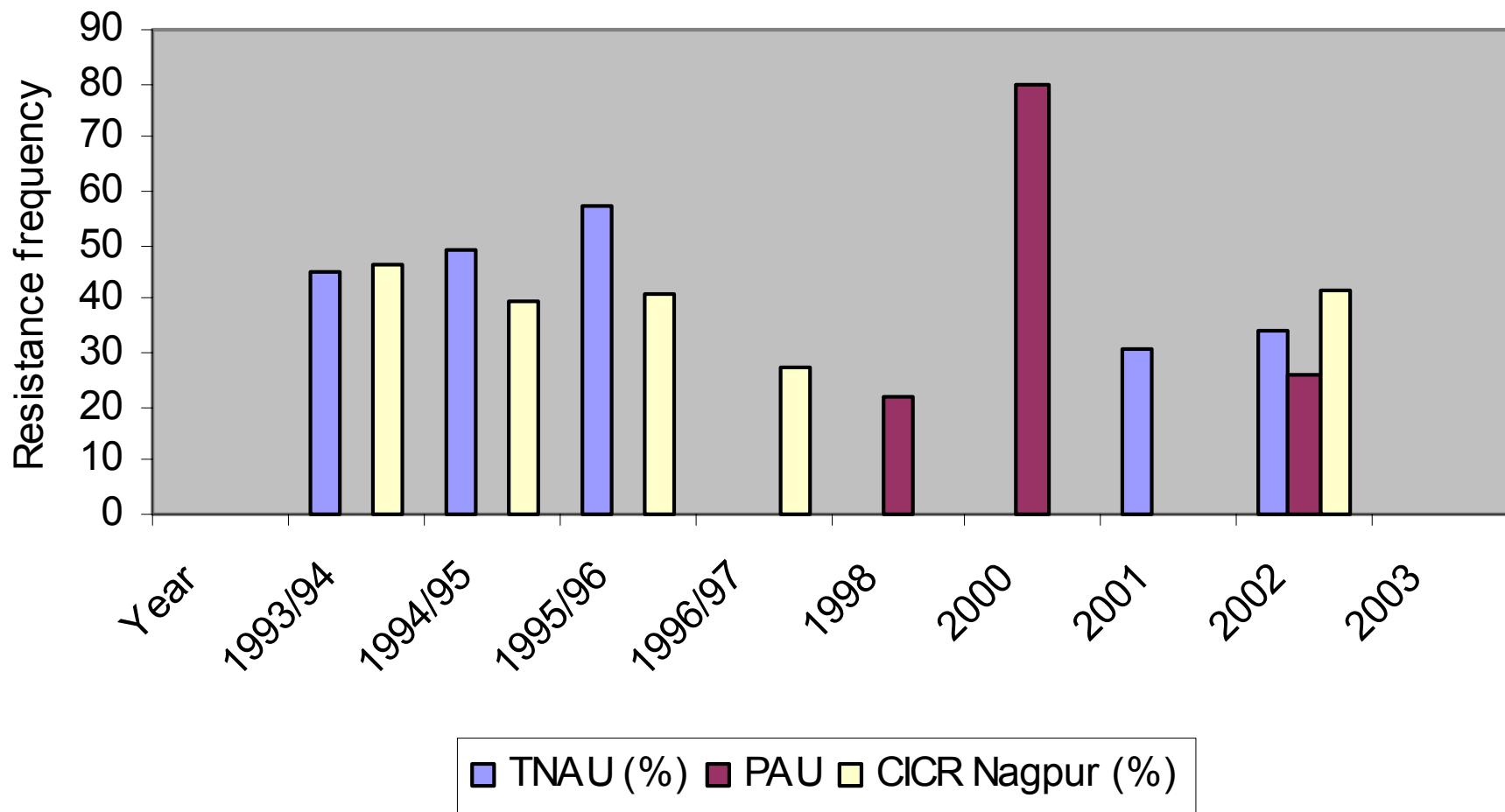
Cypermethrin (0.1 μ)



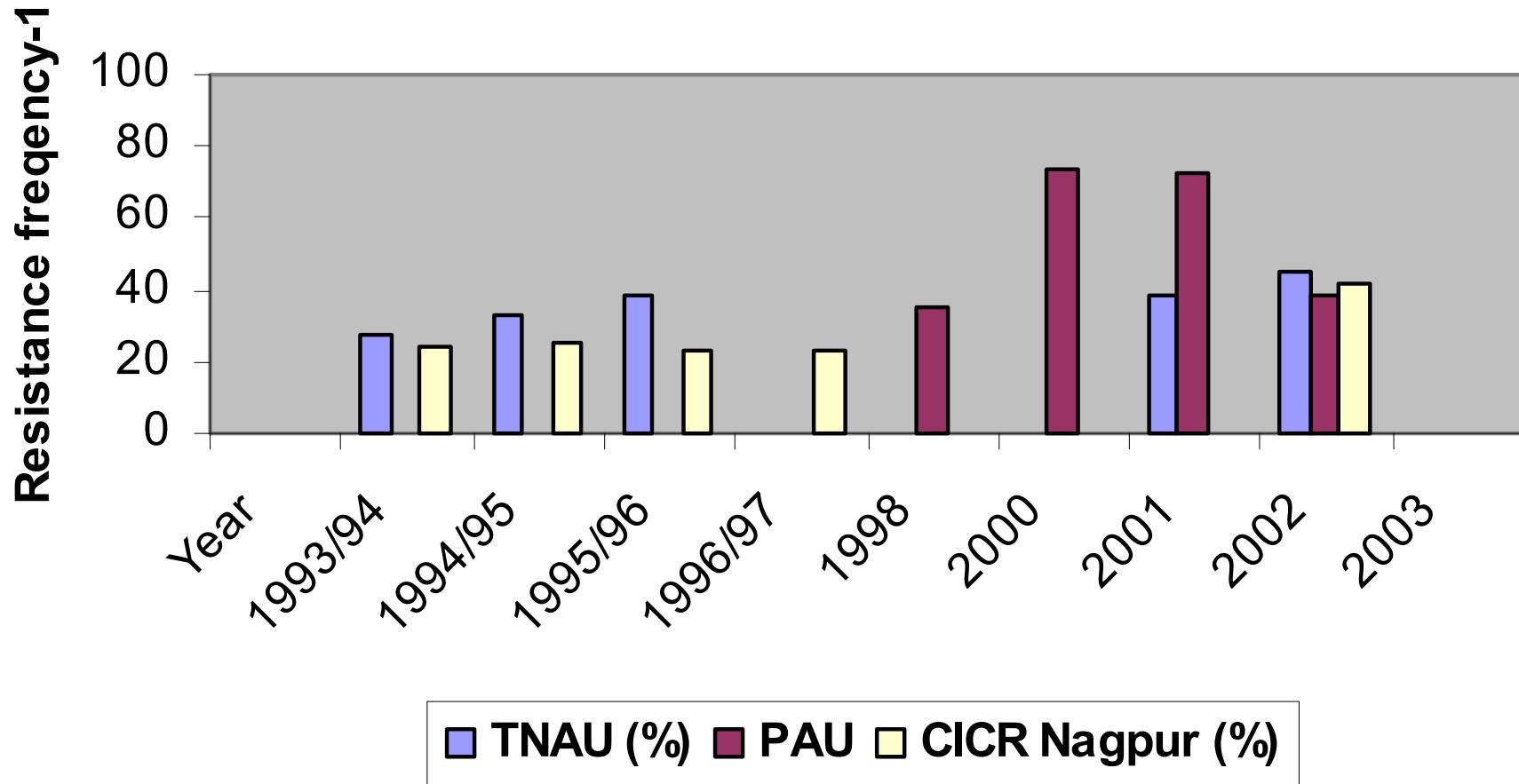
Fenvalerate



Endosulfan



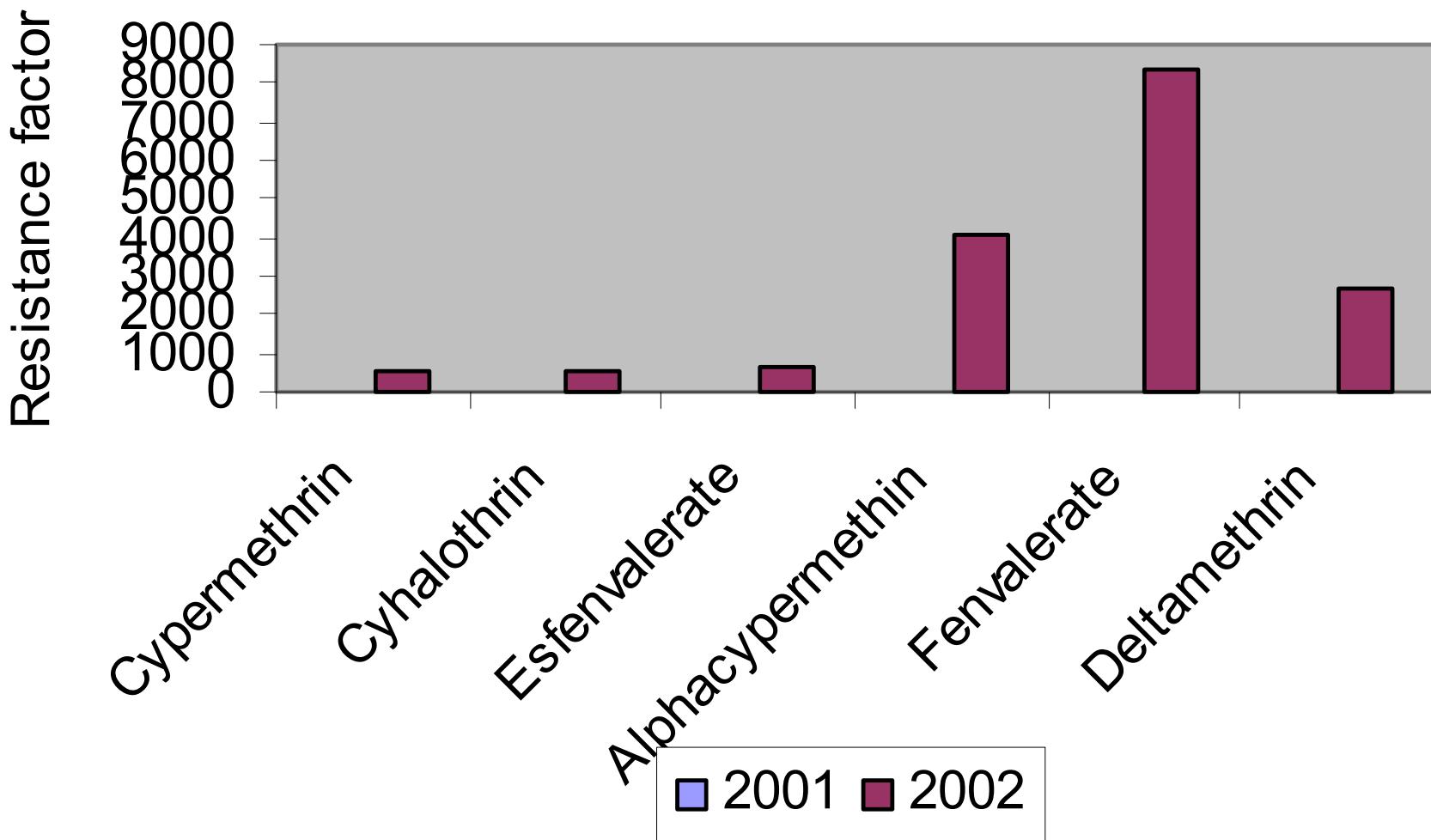
Quinalphos



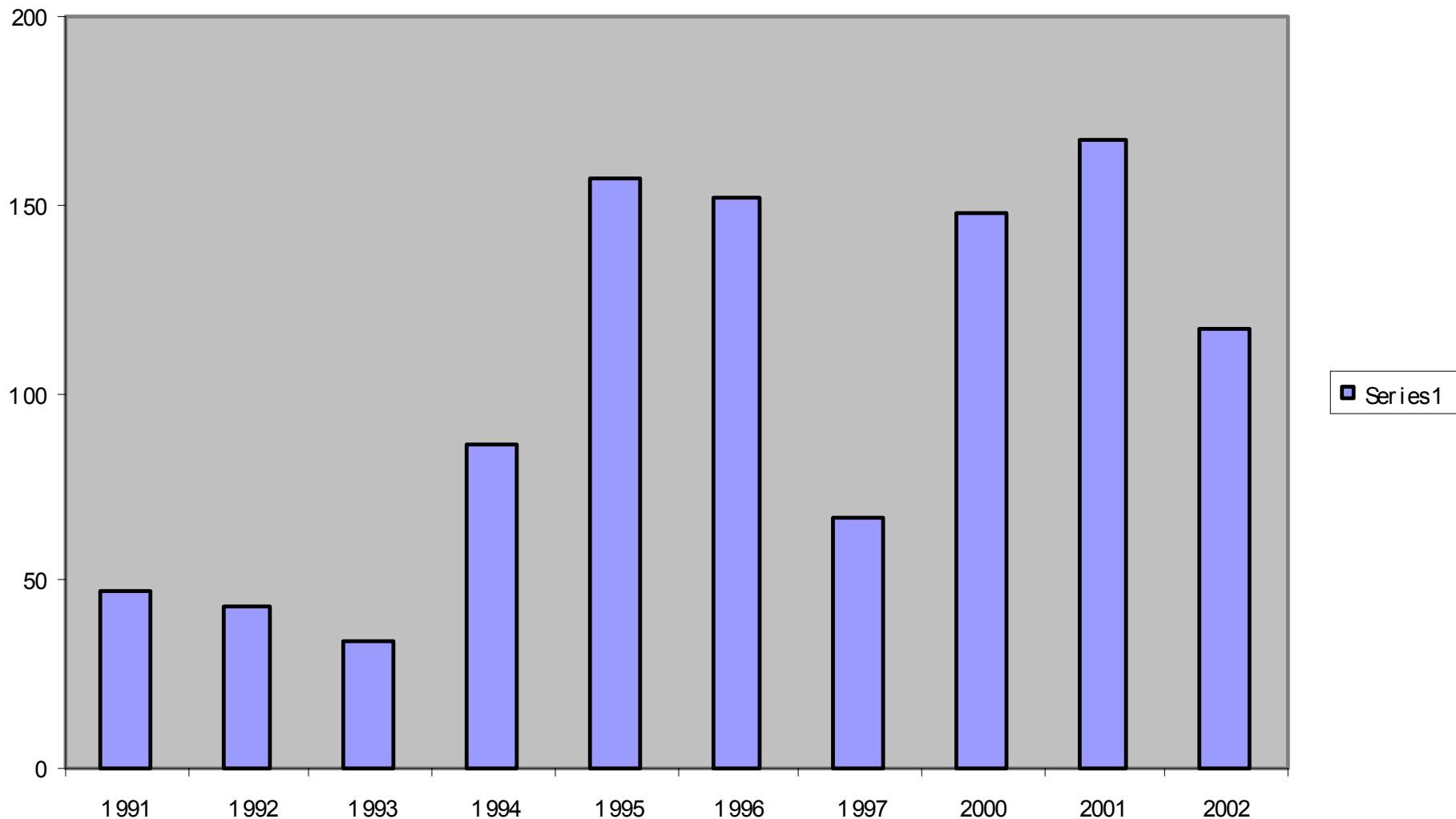
Resistance factor (RF) to certain insecticide in China



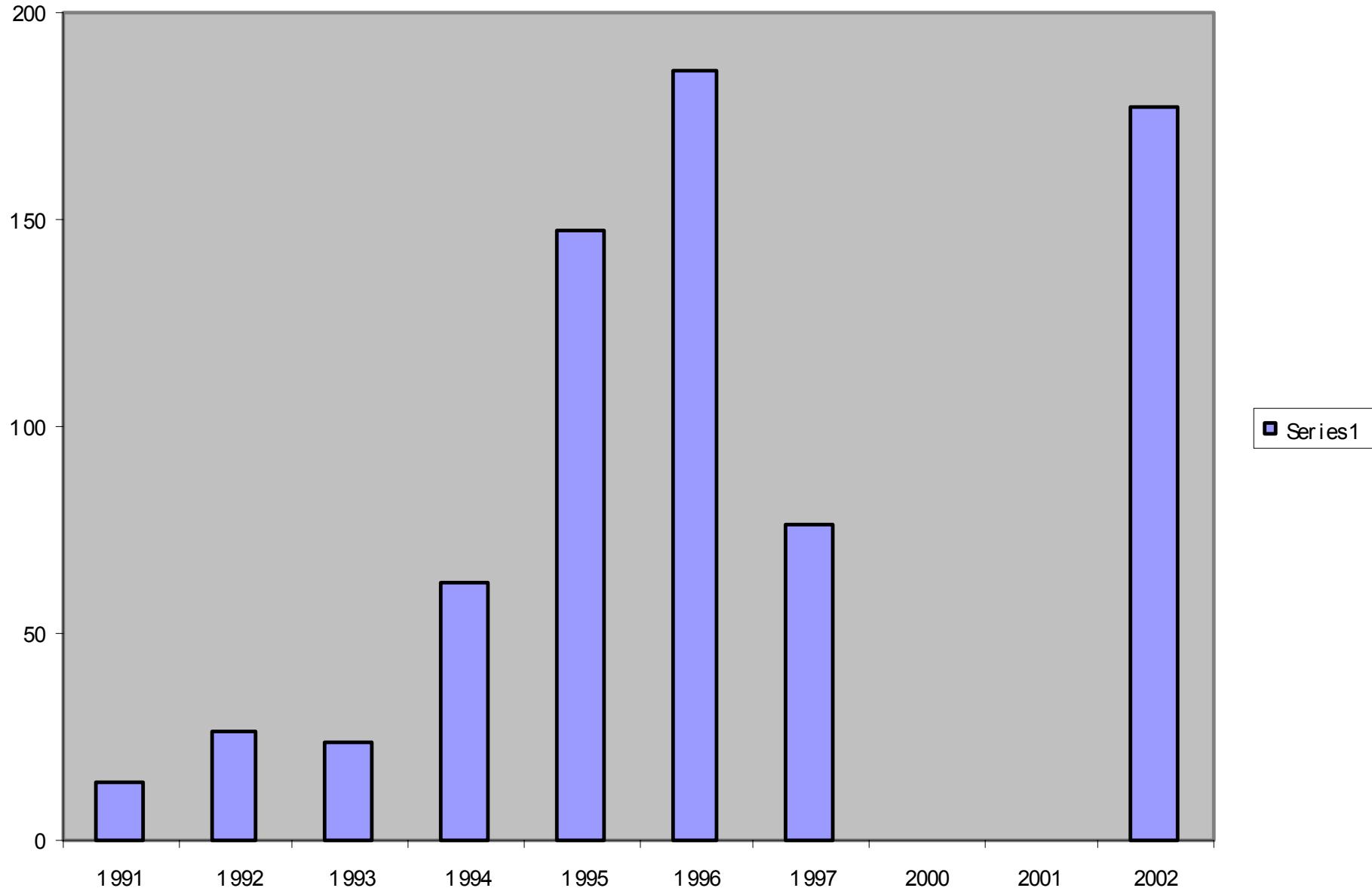
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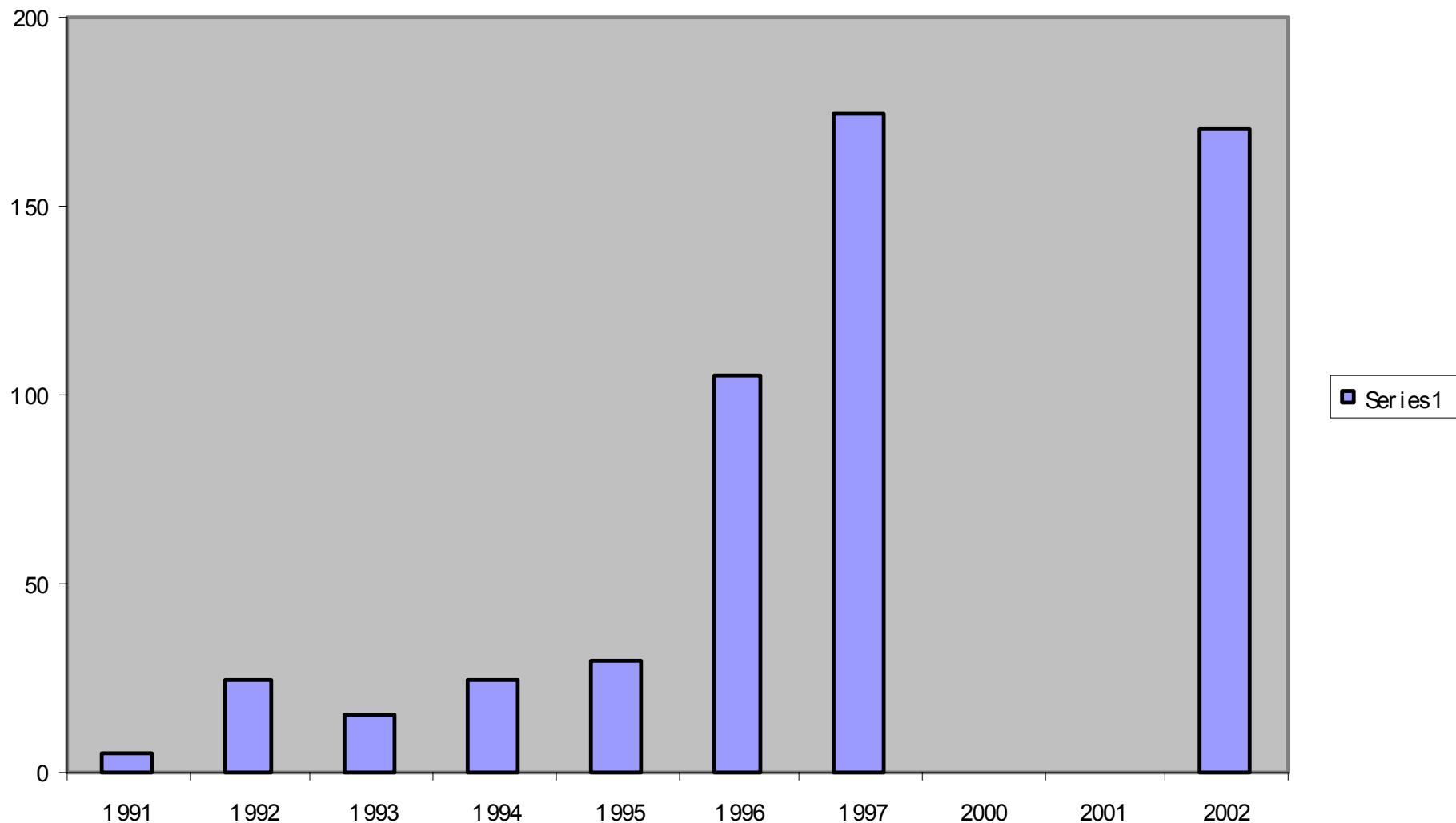
Resistance frequency to cypermethrin in Pakistan



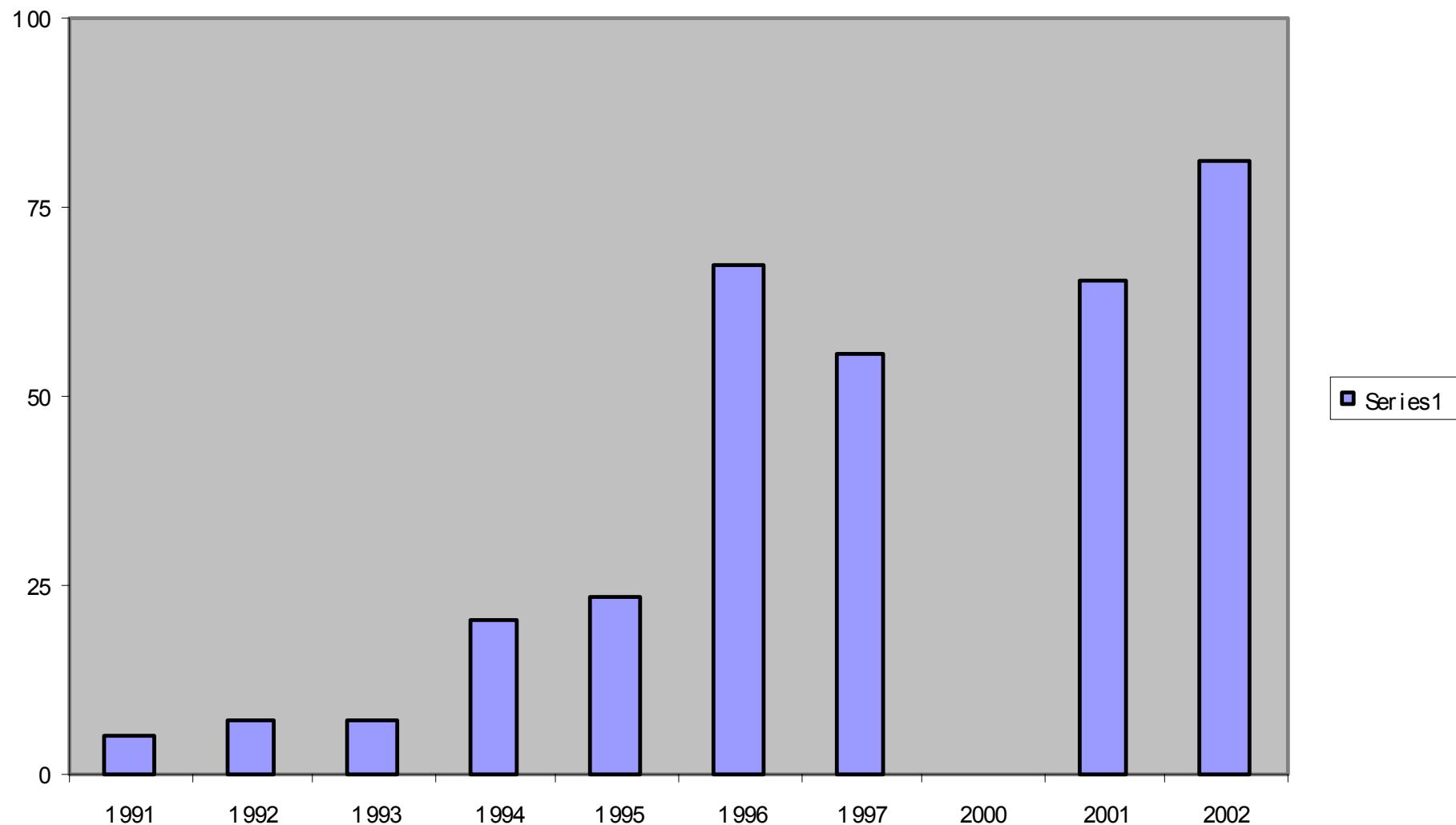
Resistance frequency to alphamethrin in Pakistan



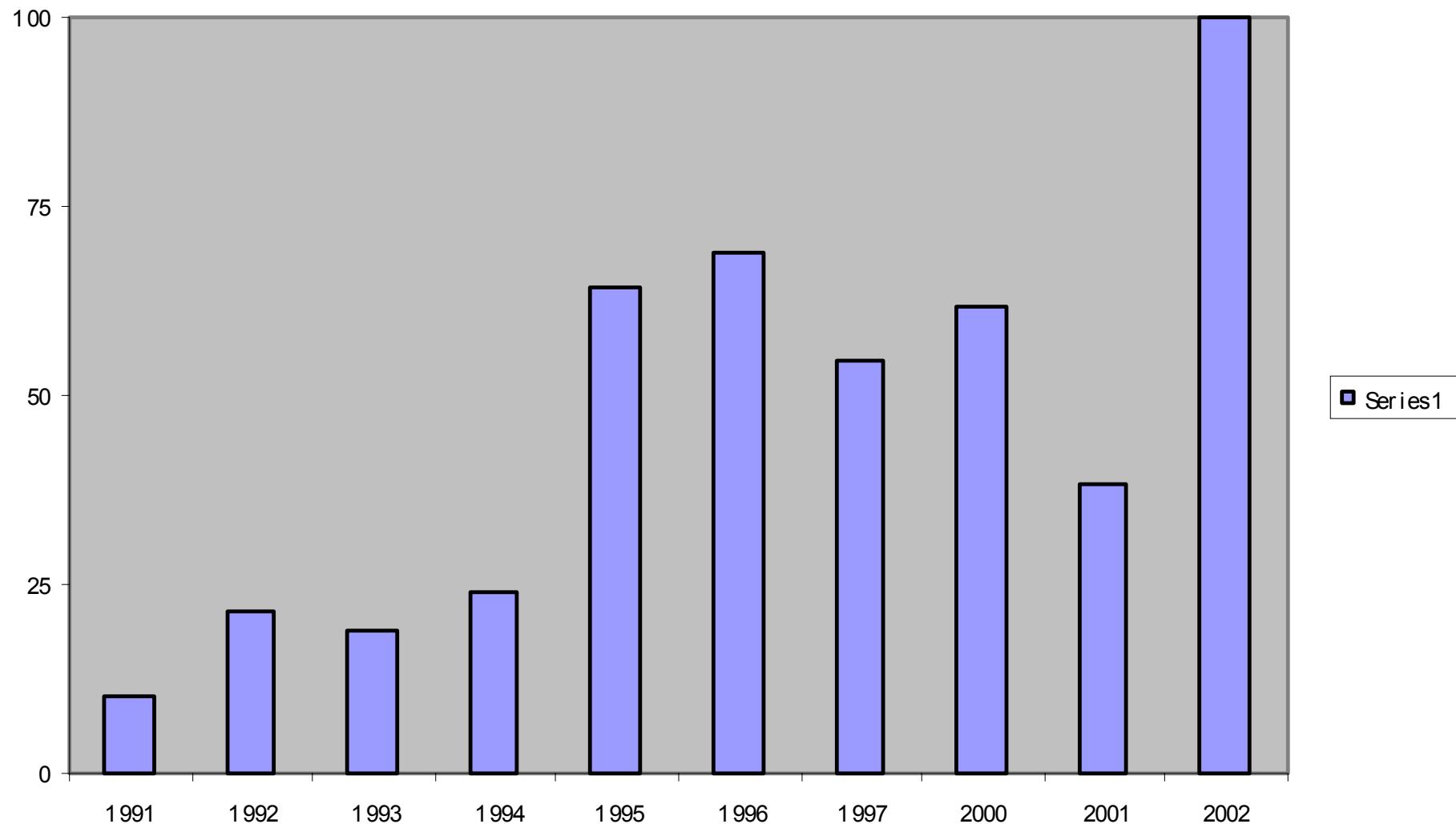
Resistance frequency to zetacyfluthrin in Pakistan



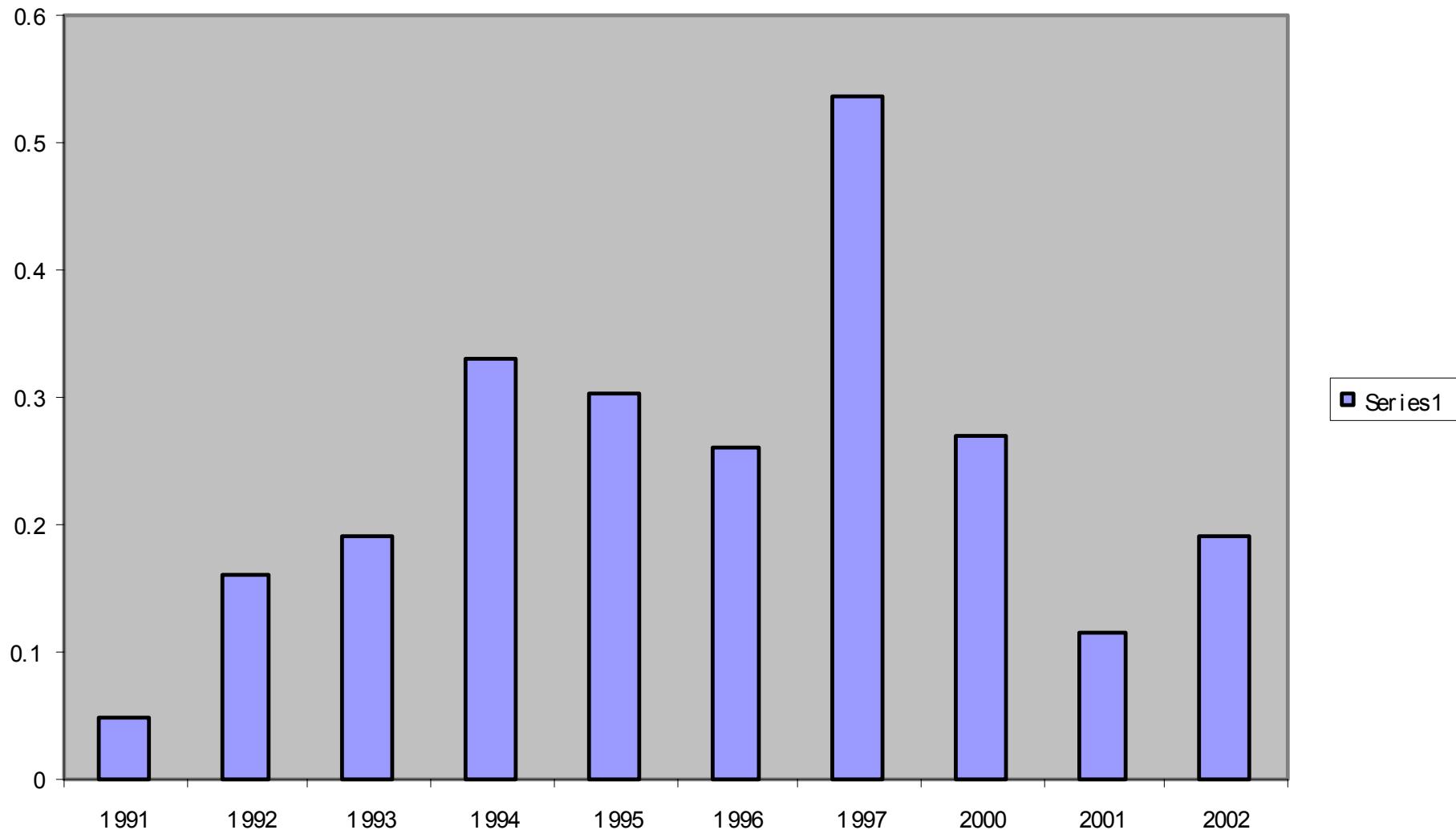
Resistance frequency to LCH in Pakistan



Resistance frequency to deltamethrin in pakistan



Resistance frequency to bifenthrin in Pakistan



CONCLUSION

INDIA

Susceptible: **Chlorpyriphos, Spinosad**

Low : **Profenofos, Methomyl**

Medium: **Endosulfan, Quinalphos**
Bifenthrin, L. Cyhalothrin, Deltamethrin

High :
Cyfluthrin, Cypermethrin, Deltamethrin, Lamda cyhalothrin

CONCLUSION

OVERALL

- Susceptible: **Chlorpyriphos(I), Phoxim (P),
Indoxacarb(P), Methomyl(C),Thiodicarb(P),
Pyrrole(P),
Abamectin(P), Spinosad(P,I)**
Low: **Endosulfan(P),Methomyl(I),Thiodicarb(I)**

**Chlorpyriphos(P),Monocrotophos(P),Pyrrole(P)
Profenofos(I,P), Phoxim(C),Methomyl(P)**

- Medium: **Endosulfan(I),
Quinalphos(I), Phoxim(C) ,
Bifenthrin(P), Cyhalothrin(P), Deltamethrin(P)**
- High: **Binfenthrin(P), B.Cyfluthrin(I), Cyhalothrin(I)
Cypermethrin(I,C,P), Deltamethrin(I)**

Very High:Cypermethrin(I,C,P), Cyhalothrin(P)

I - India, P - Pakistan, C - China