Natural enemies of rice insect pests in Chhatisgarh (M. P.), India, 1980-82.

Natural enemy	Host	Abundance (no./10 sweeps)	Incidence
	Predators		
MIRIDAE			
Tytthus parviceps (Reuter)	*Nilaparvata lugens*	2–8	Scattered
Cyrtorhinus lividipennis Reuter	-do-	5–15	Widespread
LAGAEIDAE			
Geocoris ochropterus Fieber	Mites (*Oligonychus* sp.)	1–5	Scattered
Graptostethus servus (Fabricius)	Host not determined	2–5	Scattered
NABIDAE			
Tropiconabis capsiformis Germer)	*Nephotettix* spp.	5–15	Widespread
REDUVIIDAE			
Coranus spiniscutis Reuter	Host not determined	1–5	Scattered
TETRAGNATHIDAE			
Tetragnatha spp.	Leaffolder and hopper	5–15	Widespread
THOMISIDAE			
Thomisus cherapunjesus Tikader	Host not determined	1–5	Scattered
STAPHYLINIDAE			
Paederus fuscipes Curtis	Nymphs of *Nephotettix spp.*	5–20	Widespread (more in summer
COCCINELLIDAE			
Scymnus (Pullus) victoris Motschulsky	Aphid (undetermined)	2–8	Isolated
Coccinella sp.	-do-	Rare occurrence	Isolated
	Parasites		
DRYINIDAE			
Gonatopus sp.	Nymphs of *Nephotettix virescens Sogatella furcifera Recilia dorsalis*	2–8	Sporadic
EUPELMIDAE			
Eupelmus sp. (urozonus-group)	Stem borer	2–8	Sporadic
PTEROMALIDAE			
Mesopolobus sp.	Stem borer	2–10	Scattered
EULOPHIDAE			
Tetrastichus schoenobii Ferr.,	*Tryporyza incertulas*	Rare occurrence	Scattered
PLATYGASTERIDAE			
Platygaster oryzae	*Orseolia oryzae*	1–5[a]	Scattered
BRACONIDAE			
Apanteles spp.	Stem borer	1–5[a]	Isolated

[a] Number/m^2.

ing of insects and their parasites, predators, and diseases in Chhatisgarh in 1980. An area 8,000 to 10,000 km^2 was covered and 900 to 1,200 paddy fields were surveyed annually during kharif. Several integrated pest management technology studies in farmer fields also provided data.

Most of the area surveyed was rainfed and no more than 150-200 g ai insecticide/ha was applied annually. Insecticides used by farmers were malathion, phosphamidon, carbaryl, and BHC. Varieties were 75% local and tall and 25% were the high yielding gall midge-resistant varieties Phalguna (R.P.W. 6-17), Surekha (W13400), Asha (R-35-2752), and Usha (R-35-2750), and popular varieties Kranti and Madhuri. The crop was 75–85% broadcast. Populations of beneficial insects were determined by the number of insects in 10 net sweeps or in 1-m^2 areas.

We found large populations of *Cyrtorhinus lividipennis* Reuter, *Tropiconabis capsiformis* (Germer), *Gonatopus* sp., Tetragnatha spp., and *Paederus fuscipes* Curtis (see table). These parasites and predators can be useful tools to reduce populations of harmful insects. The names of possible hosts given in the table did occur with the beneficials and were listed as hosts based upon available literature. □

Cytology of *Nilaparvata bakeri* (Muir), a grass-infesting planthopper species

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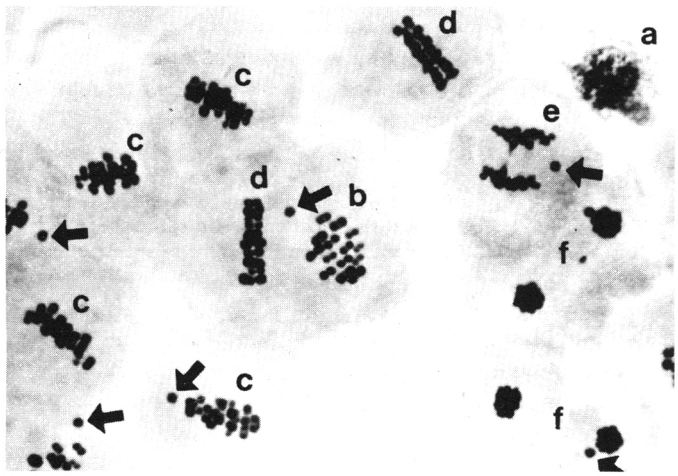
A grass-infesting planthopper, *Nilaparvata bakeri* (Muir), was found on the common weed *Leersia hexandra* (Swartz) at IRRI experimental farm. *L. hexandra* is a host of a distinct but nonrice-feeding *Nilaparvata lugens* (Stål) population. The two planthopper species could easily be distinguished by genitalic characters. Following is a description of *N. bakeri* cytology.



Different stages of the first meiotic division in *N. bakeri.* a = pachytene, b = diakinesis, c = prometaphase I, d = metaphase I. e = anaphase I, and f = telophase I. X-chromosomes are indicated by arrows. Magnification 1000 X. IRRI, 1983.

Fifty newly emerged brachypterous and macropterous *N. bakeri* males and a few females were scrutinized using standard cytological techniques for planthoppers. Data on cell cycle and cellular, nuclear, and chromosomal shapes and morphometrics are in the table.

The first meiotic division (see figure) was reductional and the second was equational. As attested by the orientation, broad spindle attachment, and parallel disjunction during anaphase I, *N. bakeri* chromosomes had diffused kinetochores or their centromeres were located along the entire length of the chromosomes.

The genomic complement was normally 2n=29 in males and 2n=30 chromosomes in females. These consisted of 28 autosomes (14 II) and a univalent X-chromosome in males and XX bivalents in females. The sex-determining mechanism was therefore XX-XO. Male morphs were heterogametic, yielding 14 I × X and 14 I + 0 sperm cells, and females were homogametic and yielded only 14 I + X ova.

Some karyological variations were observed. Meiocytes with more and less chromosomes were in the normal genomic constitution. Meiocytes with fewer chromosomes were smaller (27 µ long and wide) aneuploid cells with 6, 8, 10, 11, 12, and 13 bivalent autosomes. Those with more chromosomes were bigger (46 µ long, 38 µ wide) cells with 17, 19, and 20 bivalents.

Simple chromosome agmatoploidy could cause increased chromosome number. The holokineticity of chromosomes enabled chromosome fragments to divide and function as autonomous wholes because they have nonlocalized centromeres to direct them to the poles. Conversely, fusion of the major part of two chromosomes by reciprocal translocation reduced the chromosome number, *N. bakeri* is chromosomally polymorphic with ample genetic versatility, because of these atypical karyotypes. □

Cell cycle and cellular, nuclear, and chromosomal shapes and morphometrics of *N. bakeri.*

Stage	Shape	Length (µ)	Width (µ)
Interphase cell	Oval to circular	45	32
Nucleus	Circular	12	12
Meiosis I (see figure)			
Prophase I			
a. Leptonema cell	Oval	13-25	10-17.5
nucleus	Oval	10	8
b. Pachytene cell		15	10
c. Diplotene			
Cell	Oval	31-45	20-31
X-chromosome (a univalent)	Oval	2.2	1.5
Autosomes (14 bivalents)	Irregular	3,3,3,3,3,3,3, 3.5,3.5,4,4, 4,4,5,5	
d. Diakinesis			
Cell	Oval	3545	26-38
X-chromosome	Circular	2	2
Autosomes	Dumbbell	2.1,2.4,2.8, 3,3,3.1,3.4, 3.7,4,4,4.1, 4.4,4.8,4.8	
Metaphase I			
X-chromosome	Circular	2	2
Autosomes	Dumbbell	2,2,3,3,3,3.5 4,4,4,4,4.2, 4.5,4.5,4.5	
Anaphase I			
X-chromosome	Circular	2	2
Autosomes	Clump	9-11	7-8
Telophase I			
X-chromosome	Circular	2	2
Autosomes	Clump	5	3
Meiosis II			
Nuclei (4)	Almost circular	9.5	8.2

Weed hosts for *Cyrtorhinus lividipennis* (Reuter), a brown planthopper predator

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It is well documented that grasses and weeds conserve and enhance the multiplication of some important natural enemies of brown planthopper (BPH), but these grasses and weeds have not been identified.

Glasshouse studies investigated oviposition and egg hatchabflity if the mirid *Cyrtorhinus lividipennis,* an important predator of BPH eggs and adults. Potted cultures of several common weeds, collected from rice fields in Tanjung Karang, were enclosed in a 7.5- × 60-cm mylar cage and 5 freshly emerged adult mirid females were released. After about 48 hours. the insects were removed and the number of eggs laid were examined under a dissection microscope. Nymphs that hatched were counted and removed daily. When hatching terminated, plants were dissected and the number of unhatched

Oviposition and hatchability of eggs of *Cyrtorhinus lividipennis* **on some rice field weeds.**[a]

Species	Eggs laid (no)	Egg hatchability (%)
Echinochloa crus-galli	10.9 a	29.7 a
Cyperus diffusus	5.7 b	5.3 c
Brachiaria rnutica	0.4 c	2.5 c
Oryza sativa	12.7 a	53.6 b

[a]Mean values for 10 replications. Values followed by the Same letter do not differ significantly at P = 0.05.