ORTHOPTERA IN RICE FIELDS OF COIMBATORE

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Abstract

Orthopteran fauna in rice ecosystem at Coimbatore were surveyed in the Paddy Breeding Station and Wetlands of Tamil Nadu Agricultural University since 1997. Fifty species of Orthoptera (8 long-homed grasshoppers, 28 short-horned grasshoppers, 3 crickets, 1 tree cricket and 10 pygmy grasshoppers) were recorded in the survey. Those collected from the rice fields were found feeding on rice foliage and grains and a few of the Orthopterans *viz., Anaxipha longipennis* (Serv.), *Metioche vittaticollis* (Stal), *Metioche bicolor* (Stal.) (Trigonidiidae) collected mainly from the bunds were observed to be predators of rice insect pests.

Introduction

After the pioneering works of Kirby (1914) and Chopard (1969) on Orthoptera, the latter day publications covered the distribution of grasshoppers (Bhowmik, 1985a) tetrigids (Shishodia, 1991), endemism (Bhowmik, 1993) and regional checklists on crickets in north east India (Vasanth, 1993) and the western Himalayas (Bhowmik, 1985b). But checklisting the Orthoptera in rice fields was not attempted before even though individual pest species were studied in detail. Hence, the present study was taken up as part of our research on characterisation of rice field arthropod fauna from the rice fields at Paddy Breeding Station and wetlands of Tamil Nadu Agricultural University (TNAU), Coimbatore, since 1997.

Materials and Methods

The Orthopteran complex (long-horned grasshoppers, short-horned grasshoppers, crickets, tree crickets and pygmy grasshoppers) were collected from rice fields and rice bunds with sweepnets. The collections were made at weekly intervals between 0600 and 1100 hours. The collected specimens were identified through the works of Kirby (1914) and Chopard (1969) and by consulting named collections in the Orthoptera cabinet in the Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore.

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Results and Discussion

Our survey revealed the presence of 50 species of Orthoptera, which included eight long-homed grasshoppers, 28 short-horned grasshoppers, three crickets, one tree cricket and 10 pygmy grasshoppers in the rice fields in Coimbatore (Table 1). Those collected from the rice fields were found feeding on rice foliage and grains. Of them, *Phaneroptera gracilis*,*Conocephalus indicus, Conocephalus longipennis* (Tettigoniidae), *Aulacobothrus luteipes, Ailopus thalassinus thalassinus, Xenocatantops humilis humilis, Acrida exaltata exaltata, Truxalis nasuta, Eyprepocnemis alacris, Eyprepocnemis rosea* (Acrididae), *Anaxipha longipennis, Metioche vittaticollis and Metioche bicolor* (Trigonidiidae) are being reported for the first time from the rice fields of Coimbatore and/or Tamil Nadu.

Hieroglyphus banian (Anon, 1950), *Hieroglyphus oryzivorus* (Rao & Cherian, 1940), *Oxya japonica* and *Oxya nitidula* (both reported earlier as *Oxya velox)* (Ayyar, 1940) *Conocephalus maculatus* (Abraham, 1959), *Heteropternis respondens* (Fletcher, 1920; Ayyar, 1940), *Xenocatantops humilis* (Tandon, 1972) and *Oecanthus indicus* (Lefroy, 1909) have earlier been reported damaging rice in Tamil Nadu and elsewhere in India.

In the present study, *Phaneroptera gracilis* was found attacking the mature grains in the field. This seems to be the first report of *P. gracilis* as pest of rice in India. Elsewhere, it has been reported from the rice fields of Peninsular Malaysia (van Vreden & Ahmadzabidi, 1986). *Morismus carinatus and Holochlora albida*, though collected from the wetlands of Coimbatore (Abraham, 1959), their feeding preference is yet to be worked out. *Conocephalus indicus* was earlier recorded on sorghum at Coimbatore (Abraham, 1959) and this appears to be the first record of it on rice. *Conocephalus longipennis* is both predatory as well as phytophagous. It was collected from the rice fields and bunds and was abundant during the tillering stage of the crop. It caused typical longitudinal slits in the middle of rice leaf blades, unlike other grasshoppers and attacked mature grains subsequently. Pitkin (1980) reported its occurrence in rice in the Philippines, India and Bangladesh. As a predator, it attacked

the adults of rice leaffolders, eggs of stemborers, nymphs and adults of leaf and planthoppers. In addition, it was also found devouring crickets *Anaxipha 1ongipennis and Metioche vittaticollis.* The predatory potential of *C. longipennis* has been earlier reported in West Malaysia (Manley, 1985).

Of the remaining, *Aiolopus thalassinus thalassinus* and *Truxalis nasuta* in Pakistan (Januja, 1957), *Acrida exaltata exaltata* in Rajasthan (Khan *et al.,* 1963), *Eyprepocnemis alacris* in India (Cotes, 1893) were known as pests of rice. The rest are either grass: *Aulacobothrus luteipes* (Roonwal *et al.,* 1951) and *Eyprepocnemis rosea* (Katiyar, 1961) or crop: *Oedaleus abruptus* on sandal (Chopard & Chatterjee, 1937) feeders. *Gastrimargus marmoratus marmoratus, Atractomorpha crenulata* and *Acrotylus humbertianus* were found damaging rice nurseries in Gopichettipalayam, Coimbatore District (Ballard, 1921). *Neorthacris longicerata* has been reported only from Tamil Nadu as a pest of vegetables, millets, groundnut and other low growing crops (Fletcher, 1914).

Anaxipha longipennis is also both predatory as well as phytophagous. It produces similar feeding marks in the rice foliage as that of *Conocephalus longipennis* and also attacks the eggs of leaffolders and stemborers. *Anaxipha longipennis* as a predator was earlier established by Canapi *et al.* (1988) in the Philippines.

The rest were collected from the field bunds and along the sides of the irrigation channels. Of them, *Metioche vittaticollis and Metioche bicolor* were most abundant on the grassy bunds. *Metioche vittaticollis* is an effective predator of eggs of leaffolders and other lepidopterous pests in rice. The predatory role of *Metioche vittaticollis was* established by Rubia and Shepard (1987) in the Philippines. Feeding preference of *Metioche bicolor* is yet to be established. *Phaneroptera rosea, Mecopoda elongata, Catantops pinguis pinguis, Caloptenopsis glaucopsis glaucopsis, Spathosternum prasiniferum prasiniferum, Oedaleus senegalensis, Tylotropidius varicornis* and *Chrotogonus oxypterus* (grasses) have been recorded at Coimbatore (Ayyar & Ayyar, 1933; Abraham, 1959). Elsewhere, pest status of *Calotenopsis glaucopsis glaucopsis* on germinating wheat, barley and grain (Bhatia, 1959), *Trilophidia annulata* on pastures in Rajasthan (Banu & Kushwaha, 1974), *Neorthacris simulans* on *Rauwolfia serpentina* (Singh, 1965) and *Neorthacris acuticeps* on low growing crops (Rao, 1952) has been well documented. *Gesonula punctifrons* is a semi-aquatic grasshopper, feeding on water hyacinth in rice fields and ovipositing into the stems of taro growing along field bunds and has not been found attacking rice (Ayyar & Menon, 1933).

All the tetrigids were collected from the sides of irrigation channels and borders of rice fields. All of them were earlier collected in mountain streams near Coimbatore, except *Ergatettix interruptus* which was collected from the rice fields (Abraham, 1959). In Sri Lanka, *Criotettix tricarinatus, Ergatettix gracilis and Paratettix variegatus* were collected from the rice fields (Hancock, 1905; 1910). Tetrigids are reported to feed on small fragments of vegetation. The economic importance of this group is negligible, although there have been reports of some damage being done to rice crops in the Far East (Kevan, 1982). Further studies are in progress to determine the pest-predatory potential of these grasshoppers and crickets.

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Table 1. Orthoptera in rice fields of Coimbatore

Tettigoniidae (Long-horned grasshoppers)
Conocephalus indicus Redt. (F)
Conocephalus longipennis (de Haan) (F, B)
Conocephalus maculatus (Guillou) (F)
Holochlora albida Brunner (F)
Mecopoda elongata (Linnaeus) (F)
Morismus carinatus (Kirby) (F)
Phaneroptera gracilis Burmeister (F)
Phaneroptera roseata Walker (B)

Acrididae (Short-horned grasshoppers)
Acrida exaltata exaltata (Walker) (F,B)
Acrotylus humbertianus Saussure (F,B)
Aiolopus simulatrix simulatrix (Walker) (F,B)
Aiolopus thalassinus thalassinus (Fabricius) (F,B)
Aulacobothrus luteipes (Walker) (F,B)
Caloptenopsis glaucopsis glaucopsis (Walker) (B)
Catantops pinguis pinguis (Stal.)
Eyprepocnemis alacris (Serville) (F,B)
Eyprepocnemis rosea Uvarov (F,B)
Gastrimargus marmoratus marmoratus (Thunberg) (F,B)
Gesonula punctifrons (Stal) (B)
Heteropternis respondens (Walker) (F,B)
Hieroglyphus banian (Fabricius) (F,B)
Hieroglyphus oryzivorus Carl (F,B)
Oedaleus abruptus (Thunberg) (B)
Oedaleus senegalensis (Krauss) (F,B)
Oxya japonica (Thunberg) (F,B)
Oxya nitidula (Walker) (F,B)
Spathosternum prasiniferum prasiniferum (Walker) (B)
Trilophidia annulata (Thunberg) (B)
Truxalis nasuta (Linnaeus) (F,B)
Tylotropidius varicornis (Walker) (B)
Xenocatantops humilis humilis (Serville) (F,B)

Pyrgomorphidae (Short-horned grasshoppers)
Atractomorpha crenulata (Fabricius) (F, B)
Chrotogonus oxypterus (Blanchard) (B)
Neorthacris acuticeps (Bolivar) (B)
Neorthacris longicercata Singh & Kevan (F,B)
Neorthacris simulans (Bolivar) (B)

Trigonidiidae (Crickets)
Anaxipha longipennis (Serville) (F, B)
Metioche bicolor (Stal) (B)
Metioche vittaticollis (Stal) (B)

Oecanthidae (Tree crickets)
Oecanthus indicus Saussure (F)

Tetrigidae (Pygmy grasshoppers)
Criotettix bisponosus (Dalmon) (B)
Criotettix tricarinatus Bolivar (B)
Ergatettix dorsiferus (Walker)
Ergatettix interruptus (Brunner)
Euparateftix indicus (Bolivar)(B)
Euscelimena harpago (Serville)(B)
Euscelimena parpago (Serville)(B)
Hedotettix gracilis (de Haan) (B)
Paratettix scaber (Thunberg) (B)
Scelimea productes (Serville)