Rice Leaf Folder Cnaphalocrocis medinalis (Lepidoptera: Crambidae) on Wheat (Triticum aestivum; Poales: Poaceae) in India

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Rice leaf folder *Cnaphalocrocis medinalis* (Lepidoptera: Crambidae) on wheat (*Triticum aestivum*; Poales: Poaceae) in India

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Cnaphalocrocis medinalis Guenée (Lepidoptera: Crambidae), commonly known as rice leaf folder or rice leaf roller, is an important pest of rice paddies and is widely distributed throughout Asia (e.g., India, Pakistan, Bangladesh, Sri Lanka, China, Korea, Japan, Philippines, Indonesia; Hill 1983). In India, it is distributed in most regions of the country. *Cnaphalocrocis medinalis* is a migratory pest with 1 to 11 generations per year (An et al. 2014) and damages a broad range of graminaceous crops in the family Poaceae (Poales), including *Avena sativa* L. (oats), *Eleusine coracana* (L.) Gaertner (finger millet), *Hordeum vulgare* L. (barley), *Oryza sativa* L. (rice), *Panicum miliaceum* L. (proso millet), *Pennisetum glaucum* (L.) R. Br. (pearl millet), *Saccharum officinarum* L. (sugarcane), *Saccharum spontaneum* L. (wild sugarcane), *Setaria italica* (L.) P. Beauv. (foxtail millet), *Sorghum bicolor* (L.) Moench (sorghum), *Zea mays* L. (maize), and *Triticum aestivum* L. (wheat) (www.plantwise.org/KnowledgeBank). However, this pest has not previously been reported on wheat in India. Hampson (1896) gave only morphological features of this pest in his "Fauna of British India including Ceylon and Burma," and Rose (1982) described only the male genitalia of the type species of various species of Pyraustinae (Lepidoptera: Pyralidae) from North India, including *C. medinalis*. In this paper, we report the first occurrence of *C. medinalis* on wheat in India, describe the nature and extent of plant damage, and provide a description and illustration of morphological as well as genitalic characters of both the male and the female.

During Rabi (spring harvest) 2014–2015, *C. medinalis* was noticed on wheat in and around Yadgir (Bheemarayanagudi) and Vijayapur (Kakkalameli) Districts of Karnataka, India. To quantify the extent of damage, a survey was conducted in 2 fields at Bheemarayanagudi and 1 field at Kakkalameli. *Cnaphalocrocis medinalis* occurred at the seedling stage and continued to ear head formation stage. The extent of damage ranged from 30 to 100 % (average 75%).

Larvae are pale yellowish-green with a brownish prothoracic shield and pupate inside the rolled leaves (Fig. 1A–E). The larva rolls the leaf blade by fastening the edges with silk or fastening the leaf tip to the basal part of the leaf blade. When young seedlings were attacked, larvae were found folding 3 or 4 adjacent leaves and feeding on the leaf surface, leading to a white papery appearance. Subsequently, damaged plants desiccate, which reduces plant vigor and ultimately reduces yield.

Larvae and pupae were collected from infested fields and reared on wheat in the laboratory. Pupae were maintained in wooden cages. After emergence, adults were mounted and/or dissected for examination; wing slides were prepared according to Wallenmaier (2007); voucher specimens were deposited in the Department of Entomology, University of Agricultural Sciences, Raichur, Karnataka, India. The morphological and genitalic characters of the adults were examined following Clark (1941), Robinson (1976), Rose (1982), and Kirti & Gill (2005). Adults were photographed prior to dissection using a trinocular microscope equipped with auto-montage (Leica M205C). Hampson (1896) and Rose (1982) were used for identification. Morphological and genitalic characters of the adults of *C. medinalis* are as follows (Fig. 1F–J).

Adult Characters. The adult is brownish-yellow or brownish-orange with 2 and 1 distinct, dark wavy lines on the forewing and hindwing, respectively. Both wings have a dark brown to gray band on their outer margin. The male has a tuft of androconial hairs (*a*) on the costal margin of the forewing (Fig. 1F).

Male Genitalia (Fig. 1G, I, and J). The uncus is reduced, oval and bifid, densely setose with anteriorly directed short and strong setae; the gnathos is more or less triangular; the tegumen is reduced, carrying long setae at the distal end; the valves are long and leaf-like; the saccus normal, the phallus long and slender, with walls well sclerotized; the vesica with long sclerotization and with the distal half ornamented with numerous short spines.

Female Genitalia (Fig. 1H). The posterior and anterior apophyses (*pa*, *aa*) are weak, with the posterior pair approximately half the length of the anterior pair; the ostium is wide and moderately sclerotized; the inception of the ductus seminalis at the neck of the ductus is a little below the antrum; the ductus bursae (*db*) short, flattened, sclerotized except for very narrow section where it joins the bursa copulatrix; the bursa copulatrix (*bc*) is elongate-ovate, with a small thorn-like signum (*s*) surrounded by an extensive field of granular scobination.

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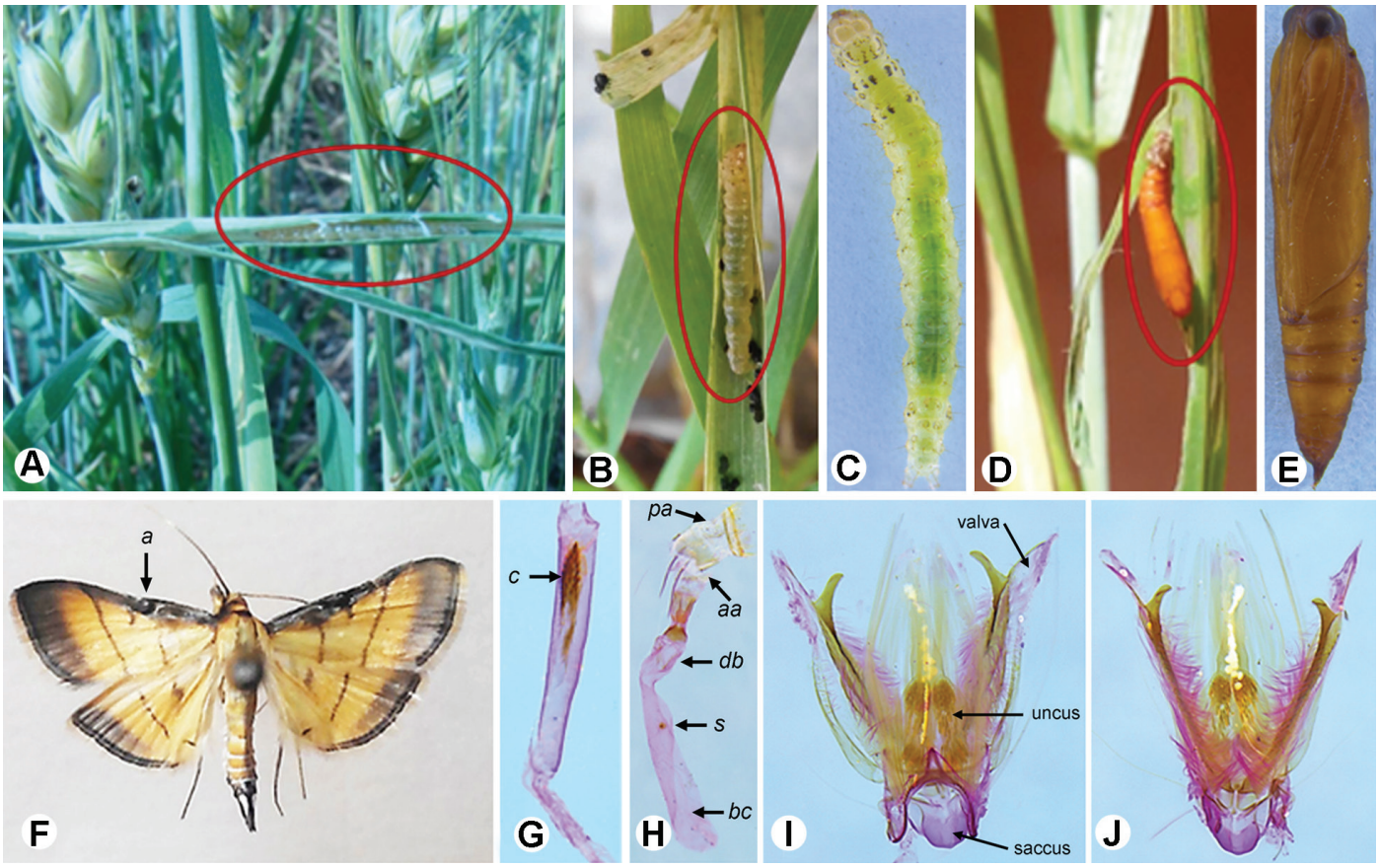

Fig. 1. Infestation of wheat by larvae and pupae of *Cnaphalocrocis medinalis*, and genitalic and morphological characters of adults. A: Damaged leaves with larvae; B: larva in rolled leaf; C: close-up of larva; D: pupa on leaf; E: close-up of pupa; F: adult male; G: male aedeagus; H: female genitalia; I: male genitalia, dorsal. J: male genitalia, ventral. *a*, androconial hairs; *aa*, anterior apophysis; *bc*, bursa copulatrix; *c,* cornuti; *db*, ductus bursae; *pa*, posterior apophysis; *s*, signum.

Summary

During Rabi (spring harvest) 2014–2015, the occurrence of *Cnaphalocrocis medinalis* Guenée (Lepidoptera: Crambidae) was noticed on wheat in and around Yadgir and Vijayapur Districts of Karnataka, India. To our knowledge, this is the first record of this species on wheat from India. We provide descriptions and illustrations of adult morphological and genitalic characters to aid in identification of the pest.

Key Words: new record; identification; morphology; genitalic character

Sumario

Durante Rabi (cosecha de primavera) del 2014 al 2015, se observó en el trigo la ocurrencia de *Cnaphalocrocis medinalis* Guenée (Lepidoptera: Crambidae) en y alrededores de los distritos de Yadgir y Vijayapur en Karnataka, India. Hasta donde sabemos, este es el primer registro de esta especie en el trigo en la India. Se proveen descripciones e ilustraciones de los caracteres morfológicos y de genitalia de los adultos para ayudar en la identificación de la plaga.

Palabras Clave: nuevo registro; identificación; morfología; carácter de genitalia

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