Flat grain beetles

(Family: Laemophloeidae – formally Family: Cucujidae)

Cryptolestes capensis	
Cryptolestes cornutus	
Cryptolestes divaricus	Flat grain beetle
Cryptolestes ferrugineus	Rust-red grain beetle
Cryptolestes klapperichi	
Cryptolestes pusillus	Flat grain beetle
Cryptolestes pusilloides	
Cryptolestes turcicus	
Cryptolestes ugandae	

Summary

Feeding strategy	secondary pest
Commodities attacked	grain and grain products, nuts, oilseeds, dried root crops
Distribution	worldwide
Economic importance	medium to high
Eggs	laid amongst commodity
Larvae	campodeiform, mobile, external feeders
Adults	long lived, feed on commodity, can fly

Introduction

The Laemophloeidae are small highly flattened beetles, the majority of which live under bark of trees and are of little economic importance. One genus, *Cryptolestes*, ranks among the most important pests of cereal and cereal products.

Identification

Cryptolestes spp. are small (1.5 to 2 mm long), reddish-brown, highly flattened parallel-sided beetles with long hair-like antennae (Figures 108–113). Head and prothorax together make up half the body length. When viewed from above, a ridge runs from above each eye down each side of the thorax (Figure 109). Antennae are long – up to the length of the body of the insect. Their highly flattened form, large head and thorax and long hair-like antennae distinguish *Cryptolestes* from other small beetles found in stored products. Unlike members of the similar Silvanidae (*Oryzaephilus, Ahasverus, Cathartus*), adult *Cryptolestes* cannot climb clean glass. Adult *Cryptolestes* species walk with a characteristic swaying motion.

Cryptolestes species are very similar to each other and identification by external characteristics alone is difficult. The most reliable method is to examine the genitalia of adult specimens. Specimens need to be cleared and slide mounted for microscopic examination, see Banks (1980) and Halstead (1993).

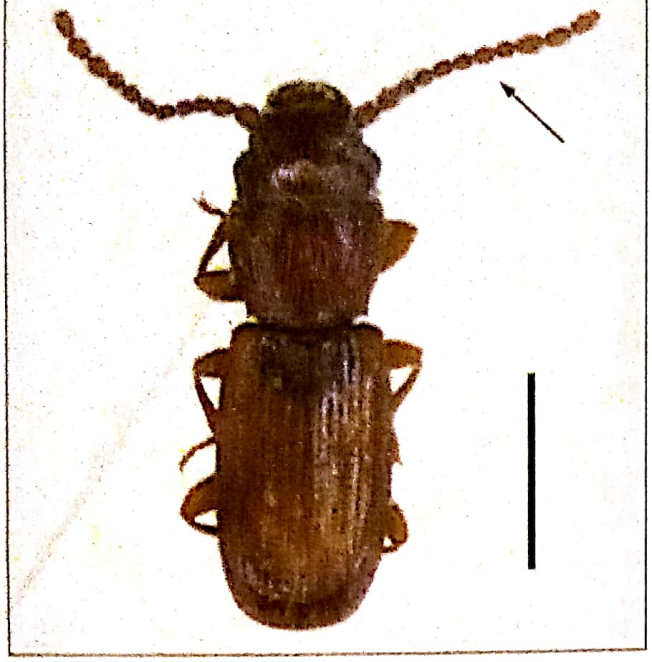

Figure 108 *Cryptolestes ferrugineus*, adult showing distinctive long antennae characteristic of genus

Figure 109 *Cryptolestes ferrugineus*, adult, head / thorax, showing ridge that runs from behind eye and across thorax

Figure 110 *Cryptolestes ferrugineus*, larva

Figure 111 *Cryptolestes ferrugineus*, infestation in rolled oats

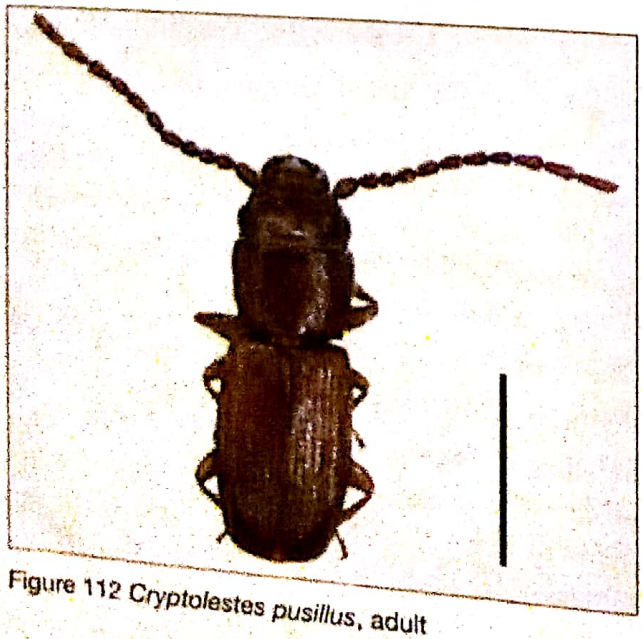

Figure 112 *Cryptolestes pusillus*, adult

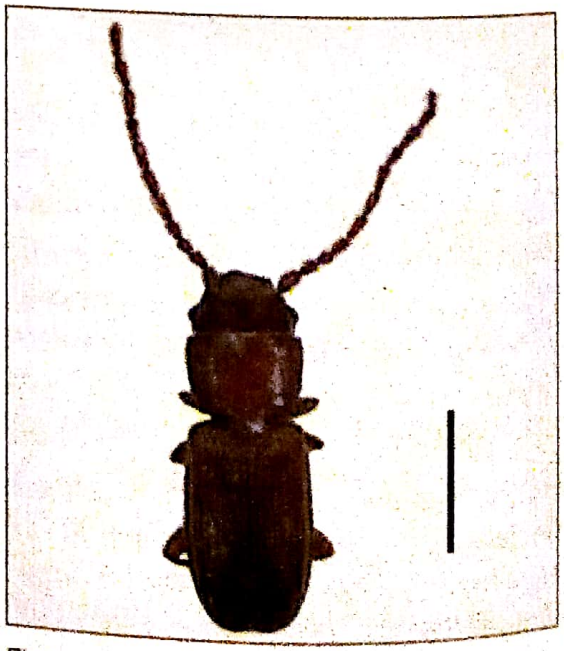

Figure 113 *Cryptolestes pusilloides*, adult

Life cycle

Eggs are laid in crevices in grains or loosely amongst the food. The flattened elongate campodeiform larva is active and moves freely through the commodity. Larvae, especially young ones, will enter minute cracks in the seed coat and burrow into the endosperm or germ. Pupation occurs either in a larval burrow in, or between grains. The long-lived adults feed on grain and grain products.

Physical limits and optimum rate of multiplication

Species	Conditions within which breeding takes place	Shortest development period, with optimum conditions	Maximum monthly rate of increase
Cryptolestes capensis	15–32.5°C, r.h. >10%	33 days at 30°C, 70% r.h.	
Cryptolestes ferrugineus	20–42.5°C, 40–90% r.h.	21 days at 35°C, 90% r.h	60
Cryptolestes pusillus	17.5–37.5°C, r.h. > 50%	22 days at 35°C, 90% r.h.	
Cryptolestes pusilloides	15–35°C, r.h. > 50%	27 days at 30°C, 90% r.h.	
Cryptolestes turcicus	17.5–35°C, r.h. > 50%	34 days at 35°C, 90% r.h.	50
Cryptolestes ugandae	17.5–35°C, r.h.> 50%	22 days at 25–27.5%, 90% r.h.	

Some strains of *C. ferrugineus, C. capensis* and *C. turcicus* are highly cold tolerant and able to survive extended periods at or below 0°C. This allows these species to be important pests in cool temperate areas. *C. ferrugineus* and *C. capensis* are able to breed under drier conditions than other species.

Economic importance

Cryptolestes are important pests of cereals, cereal products, oilseeds and dried processed foods of vegetable origin. Under tropical conditions they are found on a wider range of commodities including nuts, cocoa, copra and cassava. When infesting cereal-based products, *Cryptolestes* breed most rapidly on milled produce or on grain previously damaged by insects or by poor harvesting, storage or handling. They are often associated with heating grain. Being small and highly flattened, adults and larvae easily enter imperfections in packaged goods. Worldwide the most important species are *C. ferrugineus* and *C. pusillus.*

Type of damage and symptoms

Larvae and adults are general feeders, and damage is not readily identifiable as being specifically caused by this insect. Larvae feed preferentially on grain germ.