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**Grain and oil storage - Assistant atlas of stored grain insect
pests - Part 2: Silvanidae, Laemophloeidae**

粮油储藏 储粮害虫检验辅助图谱 第2部分：锯谷盗科、扁谷盗科

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1 Scope

The document gives, for the Silvanidae and Laemophloeidae species commonly found in stored grain, the species covered, the inspection environment and tools, and the identification characters together with the figures illustrating them.

It applies as an auxiliary reference for the identification of adults of the Silvanidae and Laemophloeidae commonly found in stored grain.

2 Normative references

The content of the following document constitutes an indispensable provision of this document through normative reference in the text. For a dated reference, only the version corresponding to that date applies; for an undated reference, the latest version, including all amendments, applies.

GB/T 37719.1 Grain and oil storage-Assistant atlas of stored grain insect pests-Part 1: Tenebrionidae.

3 Terms and definitions

The terms and definitions given in GB/T 37719.1 and the following apply.

3.1 temple; postgena - the visible area of the insect cheek behind the compound eye. Note: in the Silvanidae the temple is usually produced as a tooth-like projection, also called the postgena.

3.2 longitudinal ridge; dorsal ridge; costa - a longitudinal ridge-like or band-like elevation of the body wall surface of the insect body, of the pronotum or of the elytra.

3.3 club - the enlarged terminal portion of a clubbed insect antenna.

4 Insect species

The document covers ten species in all: among the Silvanidae, the foreign grain beetle, the two-toothed silvan beetle, the saw-toothed grain beetle, the merchant grain beetle, the South-East Asian silvan beetle and the pointed-thorax silvan beetle; among the Laemophloeidae, the rusty grain beetle, the flat grain beetle, the small flat grain beetle and the Turkish flat grain beetle.

5 Inspection environment and tools

The requirements for observation with hand lens and microscope and for the inspection tools are those laid down in the relevant provisions of GB/T 37719.1.

6.1 Basic characters of Silvanidae

The species of the family are small to medium sized, long and flattened, with the sides more or less parallel, or with an oval body; the cuticle is mostly reddish brown. The head is prognathous and the antenna has 11 segments, mostly clubbed. The pronotum is usually longer than wide, its hind margin narrower than the base of the elytra, and its lateral margin bears teeth. The front coxal cavities are closed behind; the front and middle coxae are globular and the hind coxae transverse. Each tarsus has 5 segments, the tarsal formula being 5-5-5, and in the males of a few species 5-5-4; the first tarsal segment is longer than or equal to the second, the fourth is small and the fifth the longest. Five abdominal sternites are visible. The elytra cover the apex of the abdomen. See Figure 1.

6.2 Basic characters of Laemophloeidae

The species of the family are very small to medium sized, with a flattened and elongate body. The head is prognathous and the mandibles are well developed. The antennae are long, mostly of 11 segments, filiform or moniliform. The pronotum has a complete lateral dorsal ridge and a straight anterior margin. The front coxae are globular with the coxal cavities open behind; the middle coxae are globular with the cavities open laterally; the tarsal formula is 5-5-5, in the male sometimes 5-5-4. The elytra cover the apex of the abdomen and their sides are nearly parallel. See Figure 2.

Note: the lateral dorsal ridge is the longitudinal ridge-like projection along each side of the dorsal surface of the insect body.

6.3 Species characters and figures of Silvanidae

6.3.1 *Ahasverus advena* (Waltl). Appearance: body length 1.5 mm to 3.0 mm; long-oval, yellowish brown, occasionally blackish brown, with yellowish brown hairs on the dorsal surface. Head: triangular, narrow in front and broad behind, sunk into the prothorax as far as the eyes; the temple is very small and pointed, shorter than one ommatidium; the club has 3 segments, the first markedly narrower than the second and the last one pear-shaped. Thorax: pronotum transverse, the front margin broader than the hind margin; the front angles form large blunt tubercles and the lateral margin bears numerous small teeth behind them. The elytra have nearly parallel sides, their length more than 1.5 times their combined width, and rounded apices; the rows of punctures are regular and the punctures shallow and round, with one row of setae in the first interval and three rows in the others. Note: the minute elevations of the insect body wall are called granules, and the parts larger and more raised than granules are called tubercles.

6.3.2 *Silvanus bidentatus* (Fabricius). Appearance: body length 2.5 mm to 3.5 mm; body flattened and elongate, the length to width ratio about 37 to 10; reddish brown, without distinct dark markings, dull. Head: the width across the two compound eyes is less than the width of the pronotum across its two front angles, the ratio of the two being 10 to 11.2 through 11.4; densely covered with coarse punctures and with small setiferous punctures; compound eyes of medium size, 2 to 2.5 times as long as wide, the distance between the two eyes on the ventral side of the head greater than twice the eye length; the temple is equal to or shorter than two ommatidia. The antenna has 11 segments, clubbed, without spines on the segments. Thorax: the pronotum is longer than its greatest width taken outside the front angles, the ratio being 12.9 through 13.3 to 10; the front angles are rather short, with a pointed apex clearly directed forwards and outwards, not projecting beyond the front margin of the pronotum; the central area has deep lateral longitudinal depressions. The elytra are 2.1 to 2.2 times as long as their combined width, and the shoulder width is clearly greater than the width of the hind margin of the pronotum, the ratio being 15.4 through 16.2 to 10. The male has a small spine on the hind trochanter, which the female lacks.

6.3.3 *Oryzaephilus surinamensis* (Linnaeus). Appearance: adult body length 2 mm to 3.5 mm, width 0.5 mm to 0.7 mm; body flattened and elongate, dark reddish brown to deep brown, dull, the underside and the legs paler. Head: nearly trapezoidal; compound eyes small, round and protruding, black, the long diameter made up of 30 to 40 ommatidia. The temple is large with a blunt apex, its length one half to two thirds of the eye diameter. The antenna is clubbed and has 11 segments; the ninth and tenth are transverse and semicircular and the last is pear-shaped; seen from above, the basal angles of the ninth and tenth segments are rounded. Thorax: the pronotum is slightly longer than wide, nearly rectangular, with 6 saw-like teeth on each side; the dorsal surface has 3 distinct longitudinal ridges, the median one straight and the two lateral ones clearly curved outwards and not

parallel to the median one. The elytra are long with nearly parallel sides; each bears 10 rows of punctures and 4 widely spaced longitudinal ridges. The male has a small spine near the apex of the ventral face of the hind femur.

6.3.4 *Oryzaephilus mercator* (Fauvel). Appearance: body length 2.5 mm to 3.5 mm, width 0.5 mm to 0.7 mm; dark reddish brown to blackish brown, dull. Head: triangular-trapezoidal; compound eyes large, reaching backwards almost to the hind margin of the head; the temple is small with a pointed apex, its length one quarter to one third of the eye diameter. The antenna is clubbed and has 11 segments, the ninth and tenth much wider than long; seen from above the basal angles of the ninth and tenth segments are nearly right angles. Thorax: the pronotum is slightly longer than wide, nearly rectangular, with 6 saw-like teeth on each side; the dorsal surface has 3 distinct longitudinal ridges, the median one straight and the lateral ones also rather straight and nearly parallel to it.

6.3.5 *Silvanoprus cepahlotes* (Reitter). Appearance: body length 2.0 mm to 2.8 mm, the body 3.2 to 3.5 times as long as wide; yellowish brown to reddish brown, the elytra often slightly paler. Head: the width across the two compound eyes is greater than the length of the head; the eyes are large and protruding with coarse ommatidia; the temple is extremely narrow, shorter than one ommatidium; the antenna is clubbed and the three apical segments are only slightly enlarged. Thorax: the pronotum is 1.2 to 1.3 times as long as wide and roughly barrel-shaped; the lateral margin is slightly expanded in the middle and bears numerous small teeth; the front angles are very small and directed forwards, occasionally absent, and the hind angles are blunt. The elytra have nearly parallel sides and are about twice as long as their combined width, with coarse punctures forming rows. The front femur bears a small tooth on the inner margin at the apical third.

6.3.6 *Silvanoprus scuticollis* (Walker). Appearance: body length 2.0 mm to 2.6 mm, the body 3 to 3.2 times as long as the combined width of the elytra; the dorsal surface uniformly yellowish brown to reddish brown, the underside darker. Head: the width across the two compound eyes is greater than the length of the head; the eyes are large and protruding with coarse ommatidia; the temple is very narrow and curved backwards with a pointed apex, and in ventral view the distance between the two eyes is about twice the transverse width of an eye; the three apical antennal segments form the club, the tenth being transverse and the last nearly circular. Thorax: the pronotum is inversely trapezoidal, distinctly narrowed towards the base; the front angles are strongly developed and directed forwards, their points reaching beyond the temples; the width across the two front angles is the greatest width of the pronotum and about 1.5 times the width of its hind margin. The elytra have nearly parallel sides, are 1.8 to 1.9 times as long as their combined width, and bear coarse punctures in rows.

6.4 Species characters and figures of Laemophloeidae

6.4.1 *Cryptolestes ferrugineus* (Stophens). Appearance: adult body length 1.7 mm to 2.3