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PEOPLE'S REPUBLIC OF CHINA**

GB/T 37719.3-2024

**Grain and oil storage - Assistant atlas of stored grain insect
pests - Part 3: Liposcelididae**

粮油储藏 储粮害虫检验辅助图谱 第3部分：书虱科

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1 Scope

The document gives, for the Liposcelididae species commonly found in stored grain, 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 Liposcelididae 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 intersegmental membrane - the flexible membranous part between adjacent secondary segments.

3.2 compact type abdomen - the structural form of abdomen in which the hind part of the

tergites of the third and fourth segments has no intersegmental membrane, or has an intersegmental membrane in the middle part.

3.3 link global type abdomen - the structural form of abdomen in which the hind part of the tergites of the third and fourth segments has an intersegmental membrane.

3.4 humeral seta of pronotum - the stiff seta borne on the outer upper angle of the lateral lobe of the pronotum. Note: abbreviated to S I.

3.5 pronotal seta - the stiff long seta with a truncate apex borne on the lateral lobe of the pronotum other than the humeral seta of the pronotum. Note: abbreviated to PNS.

3.6 humeral seta on notum of synthorax - the stiff seta borne on the outer upper angle of the notum of the synthorax. Note: abbreviated to S II.

4 Insect species

The document covers 4 species of Liposcelididae commonly found in stored grain: *Liposcelis entomophila*, *Liposcelis bostrychophila*, *Liposcelis decolor* and *Liposcelis tricolor*.

5 Inspection environment and tools

The inspection environment and tools for the species comply with GB/T 37719.1. Slide preparations are also used when setae and similar characters are observed under the microscope.

6.1 Basic characters of Liposcelididae

The body is very small, flattened and soft, 0.7 mm to 2 mm long, with a long-oval abdomen; a schematic drawing of the habitus is given as Figure 1. The second segment of the maxillary palp has no club-shaped sensillum. The antennae are filiform with 15 segments, each small segment of the flagellum bearing secondary annulations. The epicranial suture is almost invisible. The pronotum is divided into three lobes, a median lobe and two lateral lobes; the median lobe has a distinct median longitudinal suture and the lateral lobe bears the seta S I. The mesothorax and metathorax are fused into a synthorax, and the humeral seta S II on the notum of the synthorax resembles S I. The thoracic sterna are broad. According to whether an intersegmental membrane is present or absent at the hind part of the tergites of the third and fourth abdominal segments, the abdomen is divided into the link global type and the compact type; a schematic drawing of the tergites of the link global type abdomen is given as Figure 2 and one of the compact type as Figure 3. The hind femora are strongly swollen and each tarsus has 3 segments. Wings are usually absent; when present they are long, with a bluntly rounded apex and reduced venation.

The key to Figure 1 identifies: 1, body length; 2, antenna; 3, maxillary palp; 4, head; 5, compound eye; 6, front leg; 7, front lobe of pronotum; 8, pronotum; 9, median lobe of

pronotum; 10, middle leg; 11, notum of synthorax; 12, femur; 13, tibia; 14, tarsus; 15, claw; 16, hind leg; 17, abdomen.

6.2 Species characters and figures

6.2.1 *Liposcelis entomophila* (Enderlein). Appearance: body length 0.8 mm to 1.4 mm, light brown; a schematic drawing is given as Figure 4. Head: the antennal flagellum is brown, the maxillary palp white and the compound eyes blackish red. Thorax: the seta S I of the pronotum is markedly stout, and there are 3 to 4 PNS, forming almost a single row. Abdomen: of the compact type, with distinct brown markings; the subdivision of the first and second segments is not distinct, and the transverse bands of the sixth to ninth segments are interrupted in the middle.

6.2.2 *Liposcelis bostrychophila* Badonnel. Appearance: body length 0.9 mm to 1.2 mm; the body colour is uniform, ochre yellow to brown; a schematic drawing is given as Figure 5. Head: the antennae and the maxillary palps are pale yellow and the compound eyes blackish purple. Thorax: the seta S I of the pronotum is rather short and small, only slightly longer than the small hairs around it, and PNS are absent. Abdomen: of the link global type, with the subdivision of the first segment distinct, 3 plates in front and 2 behind.

6.2.3 *Liposcelis decolor* (Pearman). Appearance: body length 0.8 mm to 1.3 mm; pale yellowish white, almost white; a schematic drawing is given as Figure 6. Head: pale yellowish white but slightly darker, the antennae brown and the compound eyes black. Thorax: the seta S I of the pronotum is rather long, with 2 to 3 small hairs, and PNS are absent. Abdomen: of the compact type, with the subdivision of the first and second segments rather indistinct.

6.2.4 *Liposcelis tricolor* Badonnel. Appearance: body length 1.0 mm to 1.5 mm; the body colour is unevenly distributed, with three colours alternating, the body being in turn from head to abdomen yellowish brown to dark brown, colourless, and yellowish brown; a schematic drawing is given as Figure 7. Head: the darkest part, yellowish brown to dark, the antennae white and the compound eyes black. Thorax: the seta S I of the pronotum is not long and PNS are absent. Abdomen: of the link global type, with the subdivision of the first and second segments distinct, the first segment having 1 plate in front and 2 behind and the second segment 2 plates in front and 1 behind.

The key to the figures of each species identifies, in the dorsal view and the view of the lateral lobe of the pronotum: 1, head; 2, pronotum; 3, mesonotum; 4, abdomen; 5, S I; and, for *Liposcelis entomophila* only, 5, PNS and 6, S I.

A Position within the GB/T 37719 series

The document is Part 3 of GB/T 37719. Both the foreword and the introduction state that the series is planned in 4 parts: Part 1, Tenebrionidae; Part 2, Silvanidae and

Laemophloeidae; Part 3, Liposcelididae; Part 4, boring pests (Curculionidae, Bruchidae, Bostrichidae, Anthribidae, Gelechiidae).

The introduction notes that the Liposcelididae are a group of very small pests commonly encountered, that they damage grain, food, medicinal herbs, books, archives and biological specimens, and that heavy infestations can cause serious economic loss.

The document was proposed by the National Food and Strategic Reserves Administration and is under the jurisdiction of the National Technical Committee on Grain and Oil Standardization (SAC/TC 270).