



The margins of the abdominal pleura apparently have never been described. It is of importance because they have been cited (Mertin, 1941, p. 215) as a character useful in defining the subgenera of Linuparus. Because the specimens of this species are often preserved in such an orientation that their dorsal surfaces are exposed, the pleura are only rarely visible. On the holotype (GSC 5057), however, the pleural margins of somites 2 and 3 are visible and appear to be moderately coarsely spinose on the anteroventral, ventral, and posterior margins similar to L. watkinsi Stenzel (1945, Pl. 34, fig. 6).

Occurrences. Linuparus canadensis has been collected from the following localities in Canada:

1. Highwood River tributary to Bow River, Alberta; holotype GSC 5057, Niobrara-Benton?, Late Cretaceous; collected by R.G. McConnell, 1882. [Could be any of numerous outcrops of Alberta Group (Cenomanian to Santonian).]
2. Hornby Island, British Columbia; hypotype GSC 5968; Late Cretaceous; collected by Robbins, 1896. [Probably Spray Formation but possibly older Northumberland Formation or intervening Geoffrey Conglomerate, late Campanian to early Maastrichtian.]
3. Right bank of Elbow River. Alberta; loc. K-149; Benton Formation, collected by W.A. Kelley. [Could be any one of several outcrops of Alberta Group (Cenomanian to Santonian).]
4. Jumping Pound River, Alberta; loc. H-337; paratype GSC 61413; Benton Formation, Late Cretaceous; collected by G.S. Hume. [Could be any one of several outcrops of Alberta Group (Cenomanian to Santonian).]
5. Alberta, loc. H-8; Upper Benton, collected by W.A. Kelley. [Probably Wapiabi Formation (Santonian-Coniacian).]
6. Sec. 33, T19, R3, Bearing 6; Argus well, 68.6 m in S. side of river, Alberta; loc. H-180; paratype GSC 61414. [Alberta Group, "upper" Benton suggests Wapiabi Formation (Santonian-Coniacian).] Late Cretaceous; collected by G.S. Hume, 1929. This specimen can be referred only questionably to the species because it is only a small fragment of the cephalothorax and sternum. The sternum resembles those of known L. canadensis in all regards except that it lacks the paired axial spines.

Linuparus vancouverensis (Whiteaves, 1895)

Plate 4, figures 2, 4, 6, 7, Plate 5, figures 5, 8

Podocratus vancouverensis Whiteaves, 1895, p. 132, Rathbun, 1926a, p. 135.

Linuparus (Podocratus) vancouverensis (Whiteaves), Woodward, 1900, p. 395.

Hoploparia bennetti Woodward, 1900, p. 433; Rathbun, 1926a, p. 129.

Hoploparia bennettii Woodward, Whiteaves, 1903, p. 320.

Linuparus vancouverensis (Whiteaves), Whiteaves, 1903, p. 323.

Remarks. This species differs from L. canadensis in several significant features. The three carinae that extend the length of the thorax are pustulose, rather than nodose as they are in L. canadensis and the triangular region along the midline of the cephalic region is slightly raised and ornamented by fine nodes rather than by the prominent spinose processes on L. canadensis. Further, the pleural margins of L. vancouverensis appear to be spinose only on the posterior margin and the spines are much smaller. Finally, the sternum of L. vancouverensis lacks the median spines, has shallower pits at the posterior margin of the somites, and has only very fine denticles on the region of articulation with the coxa. This species seems to be generally more delicate than L. canadensis. The possibility exists that the two forms are sexual dimorphs but that appears unlikely because the two species have been collected together at only one of eight localities.

Hoploparia bennetti appears to be synonymous with Linuparus vancouverensis. Careful examination of the holotype, and sole specimen of H. bennetti (Pl. 4, fig. 7), reveals that the pleural margin of abdominal somites two and three bear small spines along the posterior margin that are very similar to those on known specimens of L. vancouverensis. In addition, the sternum of H. bennetti has been preserved, a part of the anatomy of Hoploparia that is rarely viewed. The sternum was recognized by Woodward (1900, p. 434) but was improperly interpreted as the upper surface of that structure exposed as a result of removal of the cephalothorax. In fact, the cephalothorax may very well be present but obscured beneath the sternum. The entire anterior region of this animal rotated nearly 180° around the long axis so that the ventral surface of the cephalothorax came nearly into the plane of the dorsal surface of the abdomen prior to burial. The morphology of the sternum of this animal is identical to that of known Linuparus vancouverensis and, therefore, there seems to be little doubt of the synonymy.

This specimen, GSC 5972a, also shows some detail on the telson that has not previously been described. This structure seems to be broader than long, nearly smooth on the surface, and ornamented by fine spines along the posterior

PLATE 4

All figures x1, unless otherwise indicated

- Figures 1, 3, 5. Linuparus canadensis (Whiteaves)
- 1, 3. Dorsal and ventral views of holotype GSC 5057, x0.5, showing nearly complete cephalothorax and first three segments of the abdomen.
 5. Dorsal view of the thoracic region of GSC 61413.
- Figures 2, 4, 6, 7. Linuparus vancouverensis (Whiteaves)
2. Sternum of GSC 5972a, holotype of Hoploparia bennetti Woodward, junior synonym of L. vancouverensis, x2.5.
 4. Dorsal view of syntype of L. vancouverensis, GSC 5964a.
 - 6, 7. Part and counterpart of GSC 5972a, holotype of H. bennetti, junior synonym of L. vancouverensis.