

Contributions to the knowledge of Leucosiidae VI. *Soceulia* gen. nov. (Crustacea: Brachyura)

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A new genus, *Soceulia*, is established for *Leucosia* species with third to fifth segments of the male abdomen fused, the first male pleopod with shaft coiled once on its axis, and terminating in a digitate apical process encased in a setose muff: *L. marmorea* Bell, 1855, *L. brunnea* Miers, 1877, *L. major* Chen & Ng, 2003, and a new species, *S. alainia*. The species are described or redescribed and illustrated, extended synonymies are given, and a key for their identification is provided.

Introduction

A study of the extensive collections of the Nationaal Natuurhistorisch Museum, Leiden (formerly Rijksmuseum van Natuurlijke Historie), together with other major collections (listed below), that has enabled re-examination of many type specimens and much of the published material, allowed a redefinition of the *Leucosia* Weber, 1795, and the establishment of new genera for species previously assigned in that genus (Galil, 2003a, b; 2005a, b; 2006). A new genus, *Soceulia*, is established for *Leucosia* species with third to fifth segments of the male abdomen fused, the first male pleopod with shaft coiled only once on its axis, and terminating in a setose muff: *L. marmorea* Bell, 1855, *L. brunnea* Miers, 1877, *L. major* Chen & Ng, 2003, and a new species, *S. alainia*. The species are described or redescribed and illustrated, extended synonymies are given, and a key for their identification is provided.

Abbreviations: cl. – carapace length, measured along the vertical median line of the carapace; coll. – collected by; id. – identified by; I. – Island; stn – station.

The material examined was lent by the following collections: Museum national d'Histoire naturelle, Paris (MNHN), the Natural History Museum, London (NHM), the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM), Zoologisches Museum der Humboldt Universität, Berlin (ZMB), the Zoologisk Museum, København (ZMK), and the Zoological Reference Collection, Raffles Museum of Biodiversity Research, Singapore (ZRC).

Soceulia gen. nov.

Type species.— *Leucosia marmorea* Bell, 1855; gender: feminine.

Diagnosis.— Carapace subpentagonal, globose; regions of carapace indistinct. Dorsal surface of carapace glabrous, smooth, minutely punctate. Frontal region produced, upcurved, laterally concave. Antennular fossa sealed by basal antennular segment. Antennae short, inserted between antennular fossa and orbit. Orbits small, rounded, outer

orbital margin unisutured, anterior bilobed margin of efferent branchial channel forms part of lower orbital margin. Eyes retractable. External maxillipeds concealing trapezoid buccal opening; endopod merus triangulate, as long as ischium; in female, endopod with setose fringe lengthwise, ischium medially elevated. Anterolateral margin of carapace convex along hepatic region. Pterygostomial region posteriorly planate. Lateral angle of carapace rounded, overhanging thoracic sinus, margin beaded. Thoracic sinus deep, tomentose, anteriorly defined by overhanging margin of pterygostomial region; ventral margin bearing row of granules. Posterolateral margins of carapace rounded, granulate, granules smaller, further apart posteriorly. Epimeral margin closely beaded, invisible in dorsal view, continuous with posterior margin. Posterior margin sinuous in male, rounded in female. Chelipeds subequal, robust, longer in adult male than in female specimens. Cheliped merus trigonal, bearing perliform tubercles on anterior, posterior margins, upper surface bearing coalescent cluster of ten granules proximally, followed by five or six granules disposed in two diverging rows, lower surface granulate, pitted proximally. Carpus and propodus inflated, upper surface of propodus rounded, smooth. Fingers as long as propodus. Pereiopods 2-5 slender, short. Pereiopodal propodi keeled; dactyli longer than propodi, lanceolate. Male abdominal sulcus deep, nearly reaching buccal cavity; its lateral margin bearing a distinct ridge fitting into suture between abdominal segments. Male abdomen with first segment narrow, transverse; second segment minute, shuttle-shaped; segments three-to five fused, furrowed lengthwise proximally, buttock-shaped; sixth segment bearing denticle medially; telson triangular. Female abdomen with segments three to six fused, greatly enlarged, shield-like, telson triangular. First male pleopod elongate, shaft stout, sinuous, coiled once on its axis, distally expanded, setose; apical process inserted within swollen corneous muff, digitate, grooved lengthwise. Second male pleopod short, slender, apex scoop-like.

Remarks.— *Soceulia* gen. nov. differs from *Leucosia* Weber, 1795 (emendato Galil, 2003a) and from *Coleusia* (Galil, 2006), in having the first male pleopod with shaft coiled only once on its axis; from *Euclosia* Galil, 2003 (Galil, 2003b) in having a plain rather than loop-shaped anterior margin of the thoracic sinus; from *Seulocia* (Galil, 2005b), in having segments 3-5 rather than segments 3-6 of the male abdomen fused, and apical process of first male pleopod encased in a setose muff; and from *Urnulana* (Galil, 2005a), in the shape and pubescence of the carapace, and in having a setose fringe lengthwise on the external maxilliped endopod of the female.

Etymology.— *Soceulia* is an anagram of *Leucosia* Weber, 1795.

Key to species of *Soceulia* gen. nov.

1. Sixth abdominal segment in male ridged lengthwise *S. alainia* spec. nov.
- Sixth abdominal segment in male lacking ridge 2
2. Median denticle on sixth abdominal segment in male acuminate, prominent
..... *S. marmorea*
- Median denticle on sixth abdominal segment in male minute 3
3. Sixth abdominal segment in male wider distally; distal part of the male first pleopod cup-like, apical process slightly curved, vertical *S. major*
- Sixth abdominal segment in male narrowing distally; distal part of the male first pleopod cleft, apical process hook-shaped, bent interiorly *S. brunnea*

Soceulia alainia spec. nov.
(figs 1A, B, 2A, 3A)

Material.— **New Caledonia**: holotype: 1 ♂ (38.3 mm cl), MNHN B21195, Ouen I., Prony Bay, stn 145, 22°21'S 166°50'E, 15-30 m, viii.1984, coll. Richer de Forges; paratypes: 1 ♂ (36.8 mm cl), MNHN B21347, Konduyo I., Chambeyron Bay, 3-6 m, coll. Menou; 1 ♂ (38.6 mm cl, carapace only), MNHN B21193, stn 147, 22°26'S 166°54'E, 50-60 m, viii.1984; 1 ♂ (36.4 mm cl), MNHN B30078, St. Mary Bay, 12 m, iv.1988; 1 ♂ (24.1 mm cl), MNHN B30079, stn CP 1060, northwest lagoon, 20°14.3'S 164°15.94'E, 12-14 m, 5. v.1988; 1 ♂ (24.3 mm cl), MNHN B30080, stn CP 1402, 18°57.8'S 163°37.9'E, 11 m, 14.v.1999; 1 ♀ (37.5 mm cl), MNHN B30081, Mato Ilet.— **Indonesia**: paratype: 1 ♂ (31.0 mm cl), ZMB 13402, Padang, Sumatra, coll. H. Schoede.

Description.— Dorsal surface of carapace shiny, sparsely punctate anteriorly. Frontal margin planar, medially with rounded denticle. Anterolateral margin of carapace slightly arched, bearing closely spaced flattened granules, increasing in size posteriorly. Epi-branchial margin bearing large, contiguous elliptical granules. Posterolateral margin anteriorly beaded, granules successively becoming more flat posteriorly, ending above second pereopod. Epimeral margin gutter-like anteriorly, narrowing posteriorly, marginal granules decreasing in size posteriorly, meeting posterior margin at a rounded angle. Posterior margin slightly sinuous, minutely granulate; deflexed posterior surface smooth. Thoracic sinus with row of five ovate granules above cheliped basis, decreasing in size posteriorly. Sinus anteriorly defined by granulate, rounded, slightly overhanging margin of pterygostomian region. Exognath of external maxillipeds minutely punctate. Thoracic sternites smooth, sparsely punctate. Sixth abdominal segment in male ridged lengthwise, median denticle acuminate, prominent; lateral margins nearly parallel, distal margin arched; telson sagittate. Cheliped merus half as long as carapace, its dorsal surface proximally with perliform granules, distally smooth; anterior and posterior margins with large perliform granules, diminishing in size distally. Carpus with row of granules on inner margin. Propodus 1.2 times as long as wide, its upper margin rounded, smooth; lower surface of propodus smooth, bearing granulate row on inner margin. Pereiopodal meri bearing few granules proximally on upper margin, single beaded line ventrally. Pereiopodal carpi rounded, smooth; propodi dorsally and ventrally carinate. Male first pleopod sinuous, distally bulbous, setose; apical process curved distad.

Remarks.— *Soceulia alainia* spec. nov. alone among its congeners bears a distinct ridge lengthwise on the sixth abdominal segment; it differs from *S. brunnea* and *S. major* in having a prominently spinose median denticle on that segment, and in the shape of the first male pleopod; it differs from *S. marmorea* in having the distal whorl of the first male pleopod less prominent, and the apical process curved distad.

Distribution.— Indonesia, New Caledonia.

Etymology.— Named in honor of Alain Crosnier, MNHN, in appreciation for his contributions to the study of decapod crustaceans, and in gratitude for his generous hospitality.

Soceulia brunnea (Miers, 1877)
(figs 1C, D, 2B, 3B)

Leucosia brunnea Miers, 1877: 237, pl. 38, figs 10-12; Lanchester, 1900: 764; Serène, 1968: 47.
Leucosia marmorea; Walker, 1887: 111. (Not *Leucosia marmorea* Bell, 1855.)

Leucosides urania; Rathbun, 1910: 309, pl. 1, fig. 1; Suvatti, 1950: 144. (Not *Cancer urania* Herbst, 1801.)
Leucosia singaporensis Chen & Ng, 2003: 67, figs 1g, h, 5a-k.

Material.— **Singapore**: lectotype, 1 ♀, NHM 1857.61, preserved dry; 1 ♀ (30.5 mm cl), NHM 1900.10.22.339, 13 m depth, colls Bedford & Lanchester.— **Thailand**: 1 ♂ (30.3 mm cl), ZMK, Koh Kahdat, 9-15 m depth, 16.ii-4.iii.1900, coll. Th. Mortensen, id. M.J. Rathbun as *Leucosides urania*; 1 ♂ (30.0 mm cl), USNM 39644, ex. ZMK, Koh Kahdat, 9-15 m depth, 16.ii-4.iii.1900, coll. Th. Mortensen, id. M.J. Rathbun as *Leucosides urania*.



Fig. 1. A, B, *Soceulia alainia* spec. nov., holotype, 38.3 mm cl, MNHN B21195; C, D, *Soceulia brunnea* (Miers, 1877), 30.3 mm cl, ZMK; E, F, *Soceulia major* (Chen & Ng, 2003), 36.6 mm cl, ZRC 1984.6325. A, C, E, Dorsal view; B, D, F, Ventral view.

Description.— Dorsal surface of carapace shiny, sparsely punctate anteriorly. Frontal margin planar, medially with rounded denticle. Anterolateral margin of carapace slightly arched, bearing closely spaced flattened granules, increasing in size posteriorly. Epibranchial margin bearing two contiguous rows of granules. Posterolateral margin anteriorly beaded, granules successively smaller posteriorly, ending above second pereopod. Epimeral margin gutter-like anteriorly, narrowing posteriorly, marginal granules decreasing in size posteriorly, meeting posterior margin at a rounded angle. Posterior margin slightly sinuous, minutely granulate; deflexed posterior surface smooth. Thoracic sinus with row of 6-7 ovate granules above cheliped basis, median granules largest. Sinus anteriorly defined by obsolete granulate, nearly straight, slightly overhanging margin of pterygostomian region.

Exognath of external maxillipeds anteriorly punctate. Thoracic sternites smooth, sparsely punctate. Lateral margins of sixth abdominal segment in male subparallel, narrowing distally, median denticle minute; telson lingulate. Cheliped merus half as long as carapace, its dorsal surface proximally with perliform granules, distally swollen, smooth; anterior and posterior margins with large ovate granules, diminishing in size distally. Carpus with row of granules on inner margin. Propodus 1.4 times as long as wide, its upper margin rounded, smooth; lower surface of propodus smooth, bearing granulate row on inner margin. Pereiopodal meri bearing two granulate rows on upper margin, posterior row shorter, single beaded line ventrally, but for last merus bearing single row on upper margin. Pereiopodal carpi rounded, smooth; propodi dorsally and ventrally carinate. Male first pleopod distally bulbous, setose; apical process curved interiorly.

Colour.— “brown, inclining to red on the back of the carapace” (Miers, 1877: 237). “A very deep yellow patch on uro-cardiac declivity, extending forward laterally nearly to the epibranchial angle; the same yellow colour on all the legs, but less deep on the abdomen” (Lanchester, 1900: 764).

Remarks.— Miers’ description and illustrations (1877: 237, pl. 38 figs 10-12) of his single female specimen though accurate, are less than instructive. Only a careful examination of Miers’ type specimen supported the identification of the additional material.

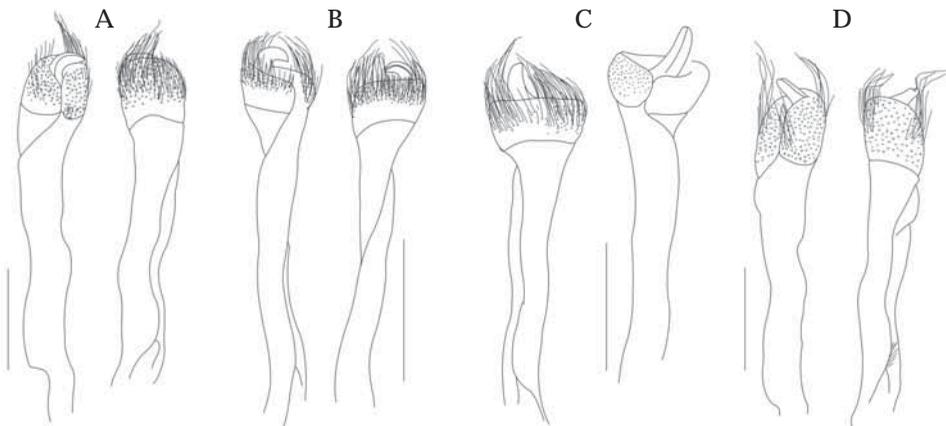


Fig. 2. Male first pleopod. A, *Soceulia alainia* spec. nov., holotype, 38.3 mm cl, MNHN B21195; B *Soceulia brunnea* (Miers, 1877), 30.3 mm cl, ZMK; C, *Soceulia major* (Chen & Ng, 2003), 36.6 mm cl, ZRC 1984.6325; D, *Soceulia marmorea* (Bell, 1855), 34.6 mm cl, NHM 1843.6. Scale 1 mm.

The lucid illustrations by Chen & Ng (2003, fig. 5a-k) leave no doubt that *Leucosia singaporensis* is identical with *S. brunnea*. The specimen described by Miers (1877) and preserved in the collection of the Natural History Museum, London (reg. NHM 1857.61) is here designated as lectotype.

Distribution.— Singapore (Miers, 1877), Thailand (Rathbun, 1910).

Soceulia major (Chen & Ng, 2003)
(figs 1E, F, 2C, 3C)

Leucosia major Chen & Ng, 2003: 64, figs 1C-F, 4.

Material.— **South China Sea**: paratype, 1 ♂ (36.6 mm cl), ZRC 1984.6325, 30 miles from Horsburgh Lighthouse, 10.ix.1983, coll. H. Huat.

Description.— Dorsal surface of carapace shiny, sparsely punctate anteriorly. Frontal margin planar, medially with rounded denticle. Anterolateral margin of carapace slightly arched, bearing closely spaced flattened granules, increasing in size posteriorly. Epibranchial margin bearing two contiguous rows of granules. Posterolateral margin anteriorly beaded, granules successively smaller posteriorly, ending above second pereopod. Epimeral margin thickened, gutter-like anteriorly, narrowing posteriorly, marginal granules decreasing in size posteriorly, meeting posterior margin at a rounded angle. Posterior margin slightly sinuous, minutely granulate; deflexed posterior surface smooth. Thoracic sinus with row of six or seven ovate granules above cheliped basis. Sinus anteriorly defined by obsoletely granulate, slightly arched overhanging margin of pterygostomian region. Exognath of external maxillipeds anteriorly sparsely punctate. Thoracic sternites smooth, sparsely punctate. Sixth abdominal segment in male widening distally, median denticle minute; telson triangular. Cheliped merus half as long as carapace, its dorsal surface proximally with perli-form granules, distally swollen, smooth; anterior and posterior margins with large perli-form granules, diminishing in size distally. Carpus with row of obsolescent granules on inner margin. Propodus 1.4 times as long as wide, its upper margin rounded, smooth; lower surface of propodus smooth, bearing row of prominent granules on inner margin. Pereiopodal meri bearing two granulate rows on upper margin, posterior row shorter, single beaded line ventrally, but for last merus bearing single row on upper margin. Pereiopodal carpi rounded, smooth; propodi dorsally and ventrally carinate. Male first pleopod distally cup-like; apical process slightly curved, pointing anteriorly.

Remarks.— *Soceulia major* closely resembles *S. brunnea*, but it is easily distinguished by its larger size, the shape of the male sixth abdominal segment, and the distally excavate male first pleopod, with its vertical apical process.

The sixth abdominal segment of the male is as long as wide and not "ca. 1.37 times as long as broad" as stated by Chen & Ng (2003: 67, table 1).

The type series consists of two male and two female specimens preserved in the Zoological Reference Collection, Raffles Museum of Biodiversity Research, Singapore (holotype - ZRC 1984.50; paratypes ZRC 1984.6325-6, ZRC 1985.79).

Distribution.— Singapore (Chen & Ng, 2003).

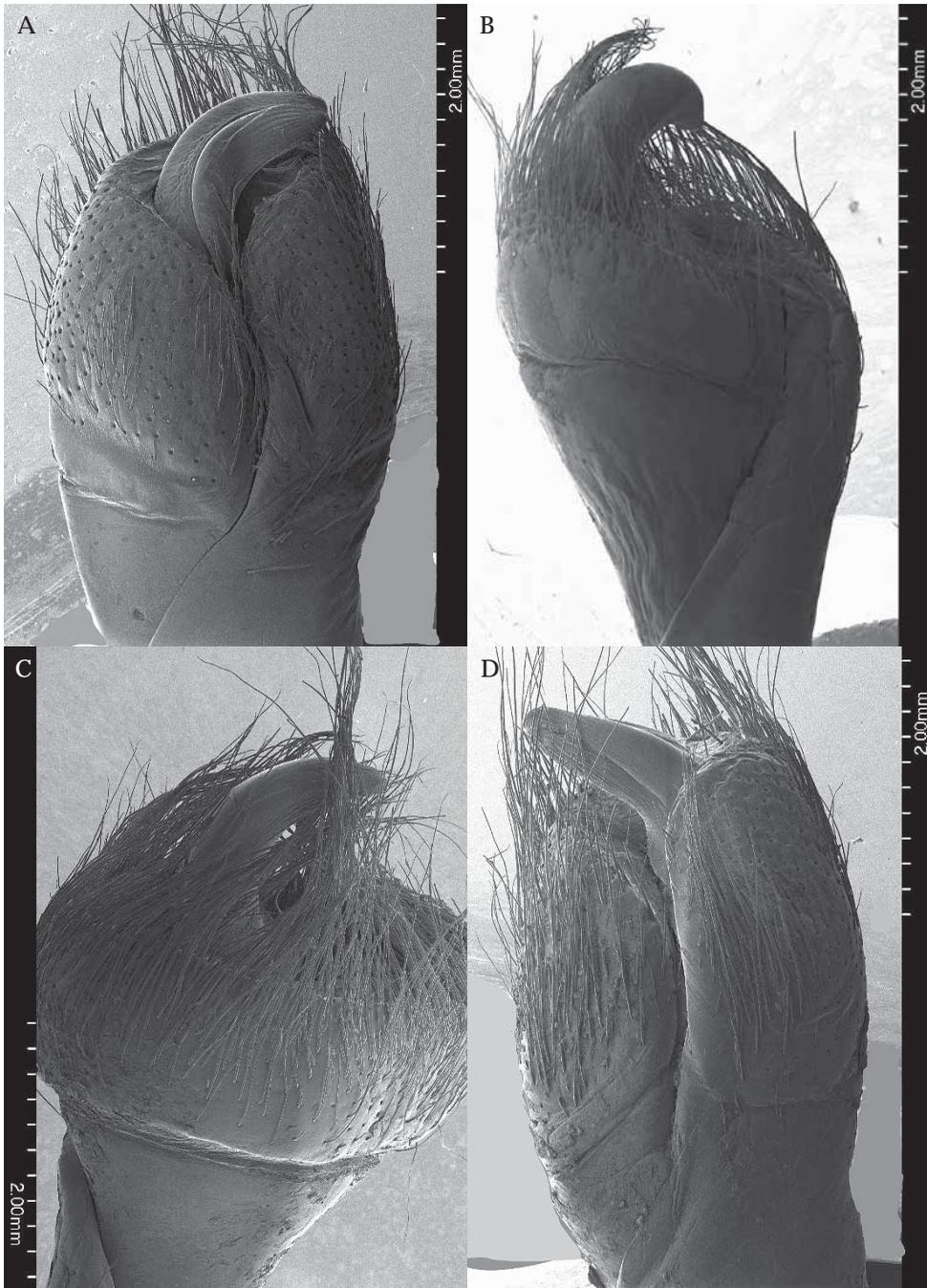


Fig. 3. Male first pleopod, detail tip. A, *Soceulia alainia* spec. nov., holotype, 38.3 mm cl, MNHN B21195; B, *Soceulia brunnea* (Miers, 1877), 30.3 mm cl, ZMK; C, *Soceulia major* (Chen & Ng, 2003), 36.6 mm cl, ZRC 1984.6325; D, *Soceulia marmorea* (Bell, 1855), 34.6 mm cl, NHM 1843.6.

Soceulia marmorea (Bell, 1855)
(figs 2D, 3D)

Leucosia marmorea White, 1847: 48 (nomen nudum); Bell, 1855a: 362; 1855b: 286, pl. 30 fig. 4; 1855c: 7; Ihle, 1918: 316; Estampador, 1937: 512; Serène, 1968: 47.
not *Leucosia marmorea*; Walker, 1887: 111 [= *S. brunnea* Miers, 1877].

Material.— **Philippines**: lectotype, 1 ♂ (34.6 mm cl), NHM 1843.6, purchase H. Cuming, preserved dry.

Description.— Dorsal surface of carapace shiny, sparsely punctate anteriorly. Frontal margin planar, medially with triangular denticle. Anterolateral margin of carapace slightly sinuous, bearing closely spaced flattened granules, increasing in size posteriorly. Epibranchial margin bearing large, contiguous elliptical granules. Posterolateral margin anteriorly beaded, granules ending above last pereopod. Epimeral margin gutter-like anteriorly, narrowing posteriorly, marginal granules decreasing in size posteriorly, meeting posterior margin at a rounded angle. Posterior margin slightly sinuous, minutely granulate; deflexed posterior surface smooth. Thoracic sinus with row of five ovate granules above cheliped basis, decreasing in size posteriorly. Sinus anteriorly defined by granulate, rounded, slightly overhanging margin of pterygostomial region. Exognath of external maxillipeds minutely punctate. Thoracic sternites smooth, sparsely punctate. Sixth abdominal segment in male with prominent, acuminate, median denticle; lateral margins nearly parallel, distal margin arched; telson triangular. Cheliped merus half as long as carapace, its dorsal surface proximally with large perliform granules, distally smooth; anterior and posterior margins with large perliform granules, diminishing in size distally. Carpus with row of granules on inner margin. Propodus 1.2 times as long as wide, its upper margin rounded, smooth; lower surface of propodus smooth, bearing granulate row on inner margin. Male first pleopod sinuous, distally muff-like; apical process curved interiorly.

Colour.— “rich yellowish-brown” (Bell, 1855b: 286).

Remarks.— *Soceulia marmorea* differs from the closely resembling *S. alainia* spec. nov. in having the distal whorl of the first male pleopod protuberant, and the apical process curved interiorly. The specimen described by Bell (1855) and preserved in the collection of the Natural History Museum, London (reg. NHM 1843.6) is here designated as lectotype.

Distribution.— Known from a single specimen from the type locality, Philippines.

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