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A New Subspecies of *Sphaerocera pseudomonilis* from Sweden

(Diptera, Sphaeroceridae)

With 14 Figures

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Abstract. *Sphaerocera pseudomonilis hallux* subsp. n. from SE Sweden is described and compared with the nominate subspecies *S. pseudomonilis pseudomonilis* NISHIJIMA & YAMAZAKI, 1984 known only from Japan. The relationships of these taxa to other congeners are discussed and a new key to Palaearctic taxa of the genus *Sphaerocera* is constructed.

The genus *Sphaerocera* LATREILLE, 1804 was recently monographed in detail by KIM (1968) with only 4 species included: *Sphaerocera curvipes* LATREILLE, 1805 (cosmopolitan), *S. tuberculosa* KIM, 1968 (NW part of North America), *S. richardsi* KIM, 1968 (Peru) and *S. monilis* HALIDAY, 1836 (Europe). KIM (1972) transferred a fifth species, *S. flaviceps* MALLOCH, 1925 (Central America and Lesser Antilles), to the genus and PAPP (1978) described a sixth species, *S. breviradiata* PAPP, 1978 (Argentina). Thus, only 2 species of *Sphaerocera (curvipes, monilis)* were known from the Palaearctic Region until very recently (see also PAPP, 1984) when NISHIJIMA & YAMAZAKI (1984) described a third species, *S. pseudomonilis*, from Japan.

In 1983 the junior author (FF) discovered two males of a peculiar and apparently undescribed species of *Sphaerocera* in Södermanland (SE Sweden). However, two years later, thanks to generous assistance of Dr. T. HAYASHI, these specimens (plus an additional pair collected in 1985) were found to be conspecific with the Japanese species *S. pseudomonilis*. A thorough comparison of specimens from both Sweden and Japan has revealed distinct differences on a subspecific level between them and, therefore, the Swedish population of *S. pseudomonilis* is described as a new subspecies below.

Sphaerocera pseudomonilis hallux subsp. n. (Figs. 1–11)

Type material Holotype ♂, Sweden: Sö. Saltsjöbaden, Älgö, RN 1014i4-4-, grass refuse, pitfall trap, 29. 9. 1985, F. FLORÉN leg. Allotype ♀, same data but collected 6. 10. 1985; paratypes 2 ♂, same data, but collected 28. 6. 1983. The abdomens of the holotype, allotype and one paratype detached, dissected and preserved in glycerine in plastic tubes pinned below respective specimens. All type specimens originally preserved in alcohol but dried and re-mounted on triangular cards during the examination; the type material is deposited in the Naturhistoriska Riksmuseet, Stockholm except for one paratype in the J. ROHÁČEK collection, Silesian Museum, Opava.

Description

Male Total body length 2.50–2.74 mm. General body colour black, somewhat dark greyish pollinose. Head black. Frons and occiput pollinose and subshiny to dull in contrast to glossy black frontal lunule, carina and gena. Carina well developed separating deep facial cavities. Cephalic bristles much reduced, weak. Frons wide, with long frontal triangle and interfrontalia. vti distinct, ors greatly reduced; 6–7 small ifr. Eye oval (8:11),

small but convex; its longest diameter about as long as the smallest genal height. Gena subdivided into three parts by distinct furrows; vibrissa and peristomal setae well developed. Antennae strongly diverging, with 1st and 2nd segment dark, 3rd paler brown. Arista bare and about 4.6 times as long as antenna.

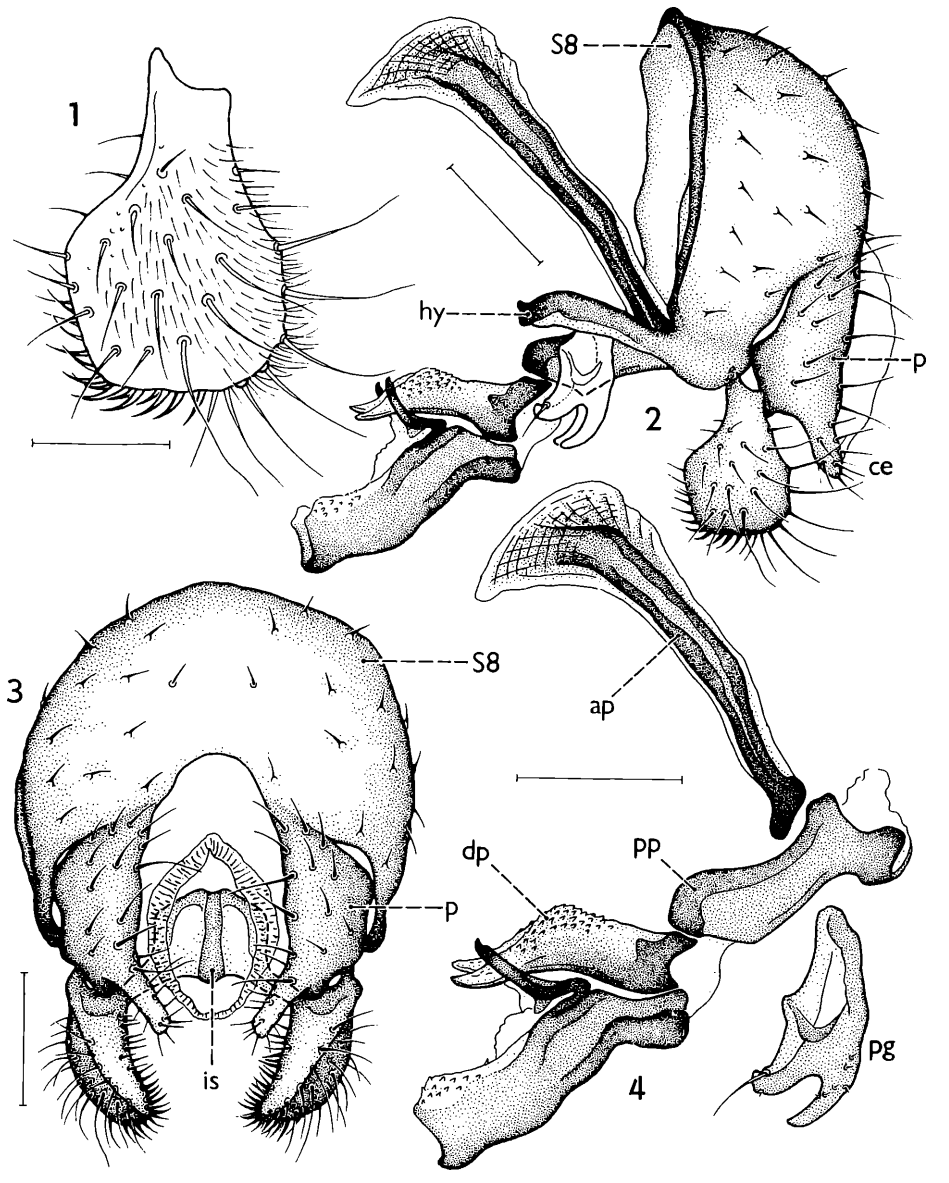
Thorax black. Mesonotum subshiny despite distinct dark grey pollination. Mesonotal setae very reduced, the strongest being 1 notopleural and 1 postalar bristle. 2 rows of acrostichal and 2 rows of dorsocentral setulae, all without basal tubercles. Scutellum rounded triangular to trapezoidal posteriorly (in contrast to all Palaearctic congeners). Disc of scutellum covered by short setulae on very small warts; lateral tooth-like tubercle on scutellar margin terminated by a very short but thick seta which is directed inwardly. Pleural part of thorax black and dark grey (or brownish grey) pollinose except for a large glabrous and glossy area in anterodorsal corner of sternopleuron. Propleuron with a distinct seta and a small shining spot above fore coxa. Sternopleuron ventrally with a longer seta and several small hairs.

Legs. Fore leg with coxa and trochanter yellowish to ochreous and sharply contrasting with black, rather shiny and somewhat thickened femur and tibia; knee and apex of tibia brownish, also tarsus unicolorously brown. Mid leg with yellowish to orange-ochreous coxa, trochanter and basal half to two-thirds of femur; apical part of femur and tibia brown and tarsus yellowish brown. Hind leg with similar colouring as mid leg but usually somewhat darker, particularly on tarsus. Hind tibia with a ventroapical spur about as long as maximum tibial width. Wing similar to that of *S. monilis* (see KIM, 1968 Fig. 44), with very pale brownish membrane and yellowish brown veins. Wing measurements length 1.83–1.98 mm, width 0.67–0.71 mm, Cs_2 Cs_3 = 2.43–2.71, Cs_3 Cs_4 = 1.75–2.00, ta-tp tp = 2.29–2.71. Halter pale yellowish.

Abdomen black, with greyish pollinose syntergum 1+2, shining 3rd and 4th tergum, duller 5th tergum and pruinose postabdominal sclerites. Preabdominal terga as in Fig. 11, becoming smaller posteriorly. Preabdominal sterna greatly reduced (Fig. 10), 2nd sternum the smallest, 5th sternum the largest. Postabdomen asymmetrical, particularly the 6th and 7th sternum.

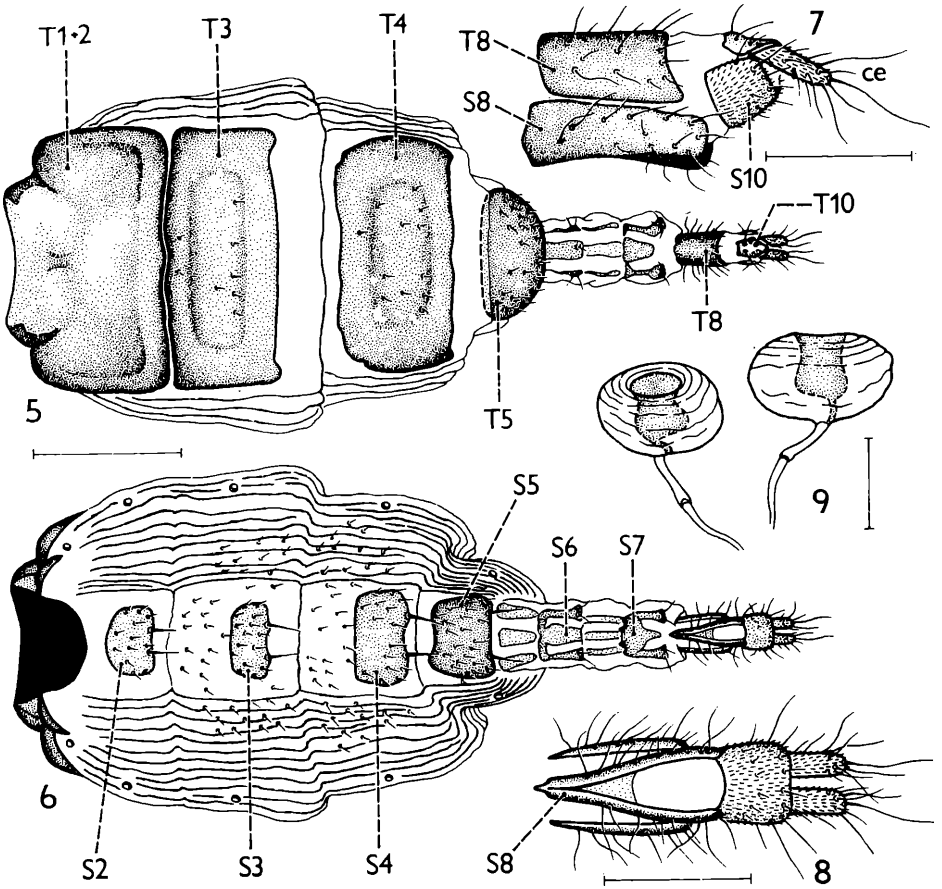
Genitalia (Figs. 2, 3). 8th sternum fused with basal portion of hypandrium and covered by reduced setulae on small tubercles. Periandrium small and partly (dorsally) fused with 8th sternum, longer setulose. Cerci slender, also fused with periandrium which is not ventrally connected (subanal plate not developed); cerci rather widely separated. Intraperiandrial sclerite (Fig. 3, is) well developed. Gonostylus (Fig. 1) relatively small, in lateral view of pentagonal shape, internally with rich setosity (including numerous thick curved setae near ventral margin), externally with longer setiform hairs and micropubescence. Aedeagal complex (Fig. 4) relatively large, with phallophore shorter than distiphallus; true epiphallus not developed although phallophore posteroventrally somewhat expanded. Distiphallus large, composed of a proximodorsal rasp-like structured and apically furcate part and of a larger distal part bearing 2 slender, dark and curved lateral projections. Postgonite elongate, with 2 distal projections, the anterior carrying a longer setula.

F e m a l e Head, thorax, legs and wing as in male unless mentioned otherwise. Total body length 2.98 mm. Fore femur and tibia more slender than in male. Wing measurements length 2.02 mm, width 0.75 mm, Cs_2 Cs_3 = 2.51, Cs_3 Cs_4 = 1.62, ta-tp tp = 2.47 Abdomen (Figs. 5, 6). Syntergum 1+2 is the largest among abdominal sclerites but 3rd tergum is almost of the same width. Also 4th tergum large and broad. 5th tergum much smaller and narrower, posteriorly rounded (Fig. 5). Preabdominal sterna (Fig. 6) much reduced, more than in nominate subspecies (cf. Fig. 13). 2nd sternum is the narrowest, 4th sternum the widest, 5th sternum the longest but narrower than 4th sternum. Postabdomen narrow, telescopic, with reduced terga and sterna of 6th and 7th segment. 8th tergum narrow but shorter than the characteristic 8th sternum being anteriorly bilaterally compressed and posteriorly splits into 2 laterally positioned plates (see Figs. 7, 8).



Figs. 1–4 *Sphaerocera pseudomonilis hallux* subsp. n. (♂ paratype). 1 – gonostylus, 2 – genitalia laterally, 3 – the same caudally (aedeagal complex omitted), 4 – aedeagal complex laterally (postgonite removed).
Scales: Fig. 1 = 0.05 mm, others = 0.1 mm. Abbreviations: ap – aedeagal apodeme, ce – cercus, dp – distiphallus, hy – hypandrium, is – intraperiandrial sclerite, p – periandrium, pg – postgonite, pp – phallophore, S – sternum.

Supra-anal plate (10th tergum) reduced, subanal plate (10th sternum) relatively wide (Fig. 8). Spermathecae 1+1 (Fig. 9) transversely oval, externally, in terminal half, with transverse grooves, internally with a invagination which is connected by means of a slender petiole with the insertion of spermathecal duct. Cerci of medium length, with 3 longer and several short hairs.



Figs. 5–9: *Sphaerocera pseudomonilis hallux* subsp. n. (♀ allotype). 5 – abdomen dorsally, 6 – the same ventrally, 7 – apex of postabdomen laterally, 8 – the same ventrally, 9 – spermathecae.
Scales: Figs. 5, 6 = 0.5 mm, Figs. 7, 8 = 0.2 mm, Fig. 9 = 0.05 mm. Abbreviations: ce – cercus, S – sternum, T – tergum.

Discussion

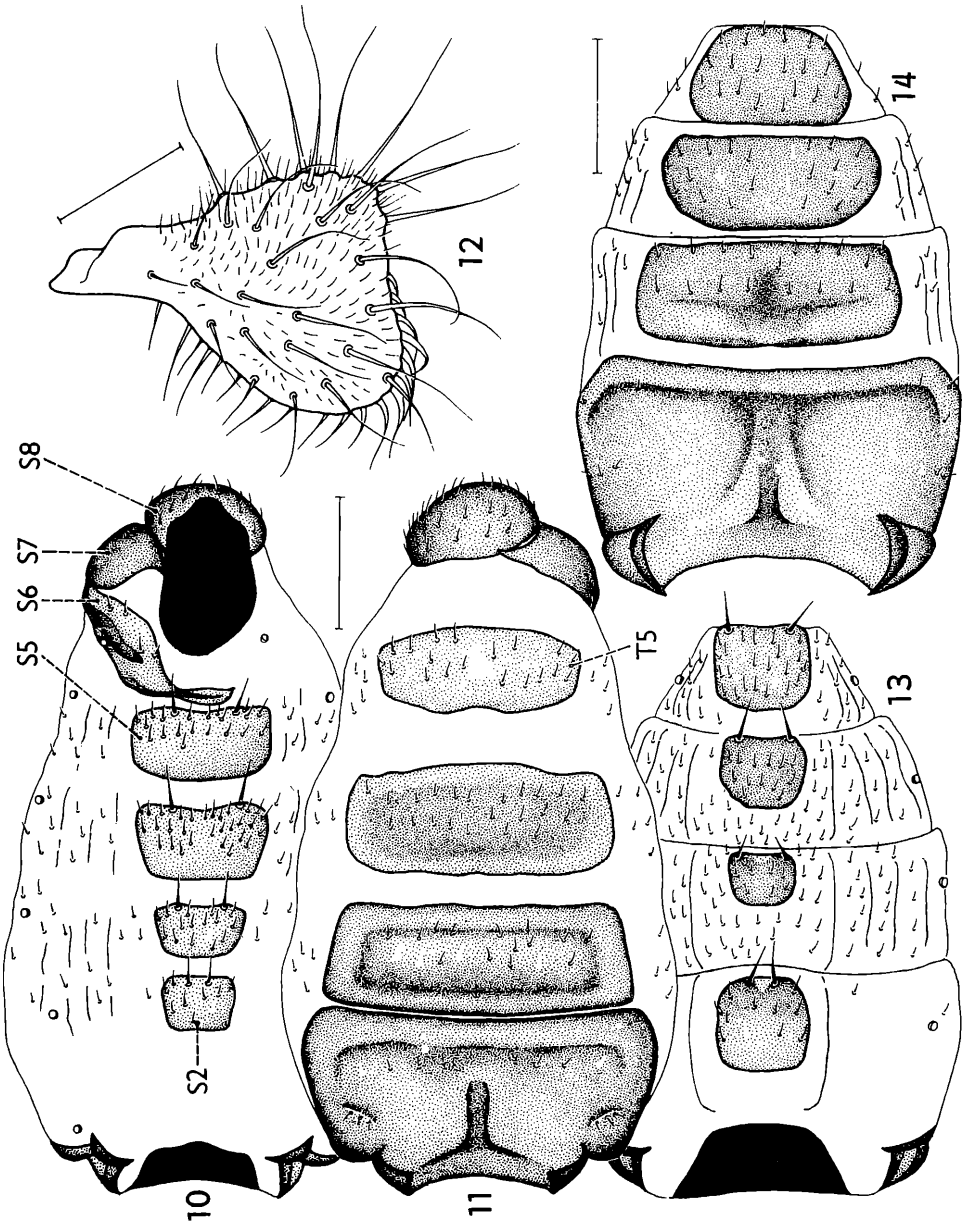
The above description of *Sphaerocera pseudomonilis hallux* subsp. n. corresponds in most characters to the nominate form which is relatively poorly described (NISHIJIMA & YAMAZAKI, 1984: 82–83). The main differences between the subspecies pertain to the male gonostylus and female abdominal sclerites (see the key below). In addition to these features, *S. pseudomonilis hallux* subsp. n. has more oval eyes (almost rounded in nominate form) and denser pollination of the head and thorax.

Biology

Largely unknown. All type specimens were caught using pitfall traps exposed in a grass refuse heap. Collecting records are from VI, IX and X.

Distribution

The new subspecies is only known from the type locality in Södermanland (Sweden). It is not known whether this population is native here or was introduced from an other



Figs. 10–11 *Sphaerocera pseudomonilis hallux* subsp. n. (♂ holotype). 10 – abdomen ventrally (genitalia omitted), 11 – the same dorsally. – Figs. 12–14: *Sphaerocera pseudomonilis pseudomonilis* NISHIJIMA & YAMAZAKI (♂♀, Japan). 12 – male gonostylus, 13 – female preabdomen ventrally, 14 – the same dorsally.
Scales: Fig. 12 = 0.05 mm, others = 0.3 mm. Abbreviations: S – sternum, T – tergum.

part of the Palaearctic Region. Possibly it occurs elsewhere in the large area between Sweden and Japan. Unfortunately most of this region is underinvestigated as regards the family Sphaeroceridae and, consequently, this question remains to be solved in the future.

Sphaerocera pseudomonilis pseudomonilis NISHIJIMA & YAMAZAKI (Figs. 12–14)

Sphaerocera pseudomonilis NISHIJIMA & YAMAZAKI, 1984: 82–83, Figs. 9, 21a, b, 23, Pl. 5 – Fig. 1.

Material examined Japan; Shibusawa, Mt. Tanzawa, Kanagawa, 1 ♂ 12. 7 1985; Mt. Myoko, Niigata, leaf litter, 1 ♂ 29. 6. – 2. 7. 1984; Kiyosato, Nagano, leaf litter, 1 ♀ 29. 6. 1984; Hokkaido, Obihiro, sheep manure, 1 ♀ 11. 6. 1982, all T. HAYASHI leg. and det., deposited in the J. ROHÁČEK collection, Silesian Museum, Opava.

Discussion

The (sub)species was described by NISHIJIMA & YAMAZAKI (1984) with figures of its general appearance, head, male genitalia and female abdominal sterna. However, most of these figures are not very precise and hence a direct comparison of the Japanese and Swedish specimens was necessary to detect true difference between both populations. Because of practically identical outer features (only small differences in the form of eye and density of body pollination) and the high similarity of the structure of the male aedeagal complex and female postabdomen both the populations are certainly conspecific. However, distinct differences were found in the form of the male gonostylus (cf. Figs. 1 & 12), in the shape of the female preabdominal terga (cf. Figs. 5 & 14) and sterna (Figs. 6, 13). The Swedish specimens are consequently considered as representatives of a different subspecies of *S. pseudomonilis*.

As correctly stated by NISHIJIMA & YAMAZAKI (1984) the nearest relative of *S. pseudomonilis* is undoubtedly the European terricolous species *S. monilis* HALIDAY, 1836. Their close affinity is clearly demonstrated by the structure of the periandrium, male cercus, gonostylus and female postabdomen (see KIM, 1968). The scutellum of *S. pseudomonilis* resembles somewhat more that of *S. flaviceps* MALLOCH, 1925 (see KIM, 1972: Fig. 311) it is true, but this Central American species is not as closely related to *S. pseudomonilis* because of the quite different structures of the male and female abdomen, apart from other dissimilarities.

Biology

NISHIJIMA & YAMAZAKI (1984) recorded specimens collected together with *S. curvipes* LATR. on "litteres" (= ? manure). The material examined originates from leaf litter and sheep manure. Apparently, *S. pseudomonilis pseudomonilis* is not rare Japan (T. HAYASHI, pers. comm., 1985) and occurs in V–VII.

Distribution

The nominate subspecies is hitherto only known from Japan.

Key to Palaearctic taxa of *Sphaerocera* LATREILLE, 1804

1 Hind basitarsus ventrally strongly emarginate at base, with a spiniform ventral seta; hind tibia armed by a robust apicoventral spur (see PAPP, 1973: Fig. 11d). Male fore and hind femora strongly thickened. Large species (3.5–4.3 mm).
S. curvipes LATREILLE, 1805

— Hind basitarsus simple ventrobasally, without spiniform seta; hind tibia with a small apicoventral spur (see PAPP, 1973: Fig. 11c). Male fore and hind femora less thickened. Smaller species (2.5–3.2 mm). 2

2 Fore tarsus with at least apical half of basitarsus and the whole of 2nd segment pale yellowish to white. Sternopleuron without glabrous shiny spot. Scutellum posteriorly rounded. Warts on bases of mesonotal and scutellar setulae distinctly developed. Male

and female preabdominal sterna relatively large (KIM, 1968: Figs. 22, 25). Male genitalia – see KIM (1968: Figs. 26, 27). Spermatheca longitudinally oval (KIM, 1968: Fig. 23). **S. monilis** HALIDAY, 1836

– Fore tarsus uniformly brown. Sternopleuron with a large glabrous and shiny area in anterodorsal corner. Scutellum posteriorly more angular (triangular to trapezoidal). Basal warts of setulae on mesonotum absent, those on scutellum reduced. Male and female preabdominal sterna much smaller (Figs. 6, 10, 13); spermathecae transversely oval (Fig. 9). 3

3 Male gonostylus roughly triangular in lateral view (Fig. 12). Female preabdomen with 3rd and 4th sterna smaller than 2nd and 5th ones (Fig. 13).
S. pseudomonilis pseudomonilis NISHIJIMA & YAMAZAKI, 1984

– Male gonostylus roughly pentagonal in lateral view (Fig. 1). Female preabdomen with 2nd and 3rd sterna smaller than 4th and 5th ones (Fig. 6).
S. pseudomonilis hallux subsp. n.

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