

To Prof. Okada with personal reply
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NEW RECORDS AND NEW SPECIES OF *DROSOPHILA* (DIPTERA : DROSOPHILIDAE) FROM INDIA

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ABSTRACT. Taxonomic account of four species of *Drosophila* is given. Of them *D. neokurokawai* is new to science, while *D. fascipennis* Okada, *D. trapezifrons* Okada and *D. unipectinata* Duda are recorded for the first time from India.

Family Drosophilidae is fairly well distributed throughout the Indian subcontinent. Altogether 120 species of *Drosophila* have so far been recorded from India. Many more species are being described every year and still several more await discovery. This paper deals with the description of one new and three hitherto unrecorded species of *Drosophila* from India.

Genus *Drosophila* Fallen

Subgenus *Hirtodrosophila* Duda

Hirtodrosophila Duda, 1923, *Mus. Nat. Hungarici*, 20 : 41. Type-species : *Drosophila latifrontata* Forta-Pessoa, Taiwan.

KEY TO INDIAN SPECIES OF THE SUBGENUS *HIRTODROSOPHILA*

1. Arista with one ventral branch 2
Arista with more ventral branches 3
2. Abdomen with four black longitudinal stripes
. *pentavittata* Gupta & Ray-Chaudhuri
Abdomen not with black longitudinal stripes 4
3. Coxae of fore and hind legs with a dark spot at their apex. Pleura with a faint brown stripe *bicolovittata* Singh
Coxae of fore and hind legs without a dark spot at their apex. Pleura yellowish-brown *confusa* Staeger
4. Wings with two large black patches. Abdomen entirely glossy black *fascipennis* Okada
Wings without large black patches. Abdomen yellow, with brownish apical bands *neokurokawai*, sp. nov.

1. *Drosophila (Hirtodrosophila) neokurokawai*, sp. nov. (Figs. 1A-C).

Male and female : Yellowish. Mean body length of 3♂♂ 2.45 mm.

Head ♂ : Arista with 5 dorsal and 1 ventral branches in addition to terminal

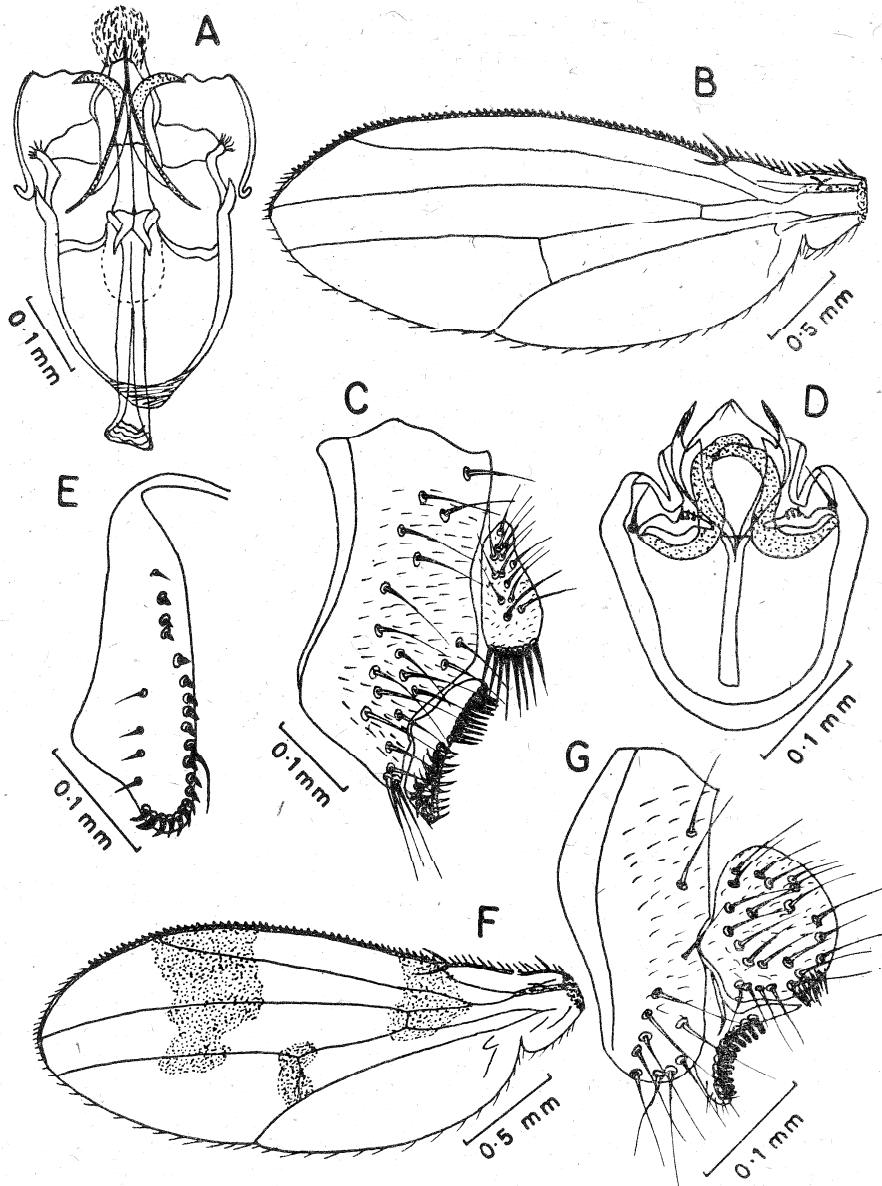


Fig. 1. A-C. *Drosophila neokurokawai*, sp. nov. : A, Phallic organs; B, Male wing; C, Periphallic organs. D-G. *Drosophila fascipennis* Okada : D, Phallic organs; E, Egg guide; F, Male wing; G, Periphallic organs.

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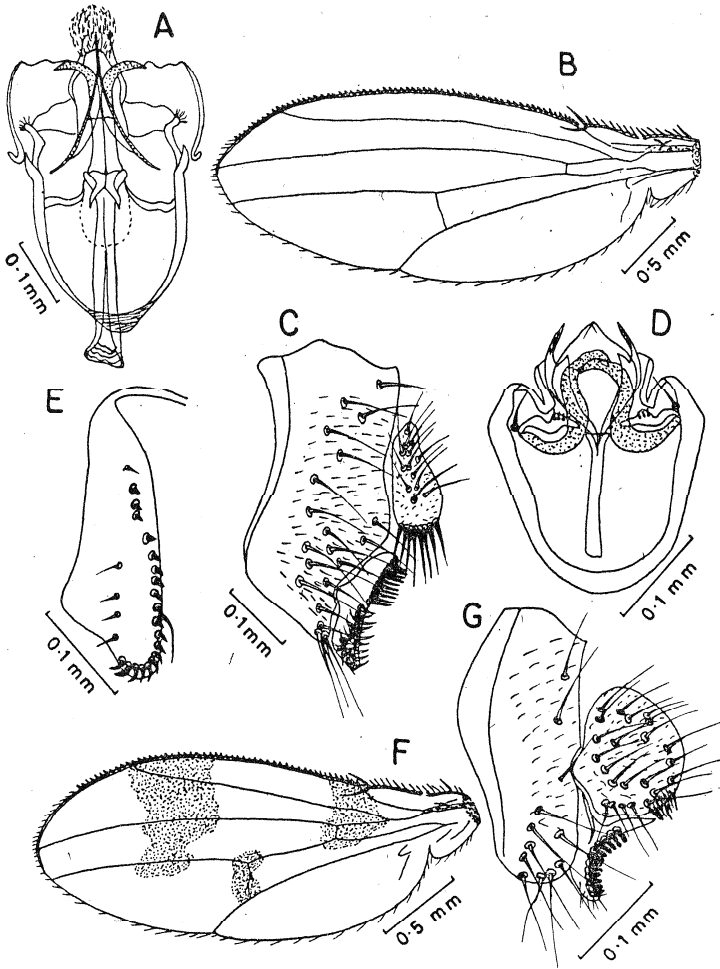


Fig. 1. A-C. *Drosophila neokurokawai*, sp. nov. : A, Phallic organs; B, Male wing; C, Periphallial organs. D-G. *Drosophila fascipennis* Okada : D, Phallic organs; E, Egg guide; F, Male wing; G, Periphallial organs.

fork. Antennae with second segment yellowish-brown. Ocellar triangle tan. Orbitals in ratio of 5:2:9. Second oral about half the length of vibrissa. Palpi orange-brown, with one apical seta. Carina orange, high. Face and cheek yellowish-brown, greatest width of cheek 0.14 the greatest diameter of eye. Clypeus brownish. Eyes dark red. *Thorax* ♂ : Acrostichal hairs regular, in six rows. Anterior scutellars parallel; posterior scutellars convergent. Distance from anterior dorsocentral to posterior dorsocentrals about half the distance between two anterior dorsocentrals. Mesonotum and scutellum unicolorous, yellowish-brown. Sterno-index about 0.34. *Wings* ♂ (Fig. 1B) : Clear. Indices : C-Index 3.39; 4V-index 1.5; 4C-index 0.65; 5X-index 1.6. Two equal bristles at the apex of first costal section; heavy bristles on about basal 0.6 of third costal section. Halteres pale-brown. *Legs* : Yellow, preapicals on all three tibiae; apicals on first and second tibiae. *Abdomen* ♂ : Abdominal tergites yellow, with brownish apical bands. *Periphallic organs* (Fig. 1C) : Genital arch brown, pubescent, broadened dorsally and slightly narrowing ventrally, with about 22 bristles. Clasper large, narrow, outer margin concave, with two sets of teeth, upper set with 8-10 sharply pointed large black teeth arranged in a row; lower one with about 30 relatively smaller and randomly distributed pointed teeth. Anal plate oblong, pubescent with 13-15 bristles, ventral margin broadly truncate and with about 8 large stout black bristles arranged in a row. *Phallic organs* (Fig. 1A) : Aedeagus pale brown, straight, subapically swollen, apically with hairy crown. Basal apodeme of aedeagus nearly equal. A pair of black curved, hypandrial processes present. Posterior parameres fused with aedeagus. Ventral fragma nearly quadrate.

Holotype ♂, INDIA : WEST BENGAL : Darjeeling district, Rimbick, 18.ix. 1979, Coll. O.P. Singh and J.P. Gupta. Deposited in the Department of Zoology, Banaras Hindu University, Varanasi, India. *Paratypes* : 2♂♂, same data as for holotype. In the Department of Zoology, B.H.U., Varanasi and Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

Relationships : This species belongs to the *denticeps* group of *Hirtodrosophila*. It closely resembles *D. kurakawai* Okada in having longer wings, a pair of black, curved hypandrial processes, aedeagus apically with hairy crown and ventrally truncate anal plate. But it distinctly differs from *D. kurakawai* in having one ventral branch of arista (two in *kurakawai*), genital arch slightly narrowing ventrally (sharply pointed in *kurakawai*), ventral fragma nearly quadrate (broader than long in *kurakawai*), clasper with two sets of teeth (only one row in *kurakawai*), 8 long black bristles on ventral margin of anal plate (6 in *kurakawai*).

Distribution : India : West Bengal.

2. *Drosophila (Hirtodrosophila) fascipennis* Okada (Figs. 1D-G)

Drosophila fascipennis Okada, 1967, *Mushi*, 41 (1) : 8 (Japan).

Head ♂, ♀ : Arista with 3-4 dorsal and one ventral branches in addition to terminal fork. Cubitals in ratio of 6:1:7. Second oral thin and not differentiated.

Face and cheek yellowish-brown, greatest width of cheek 0.17 the greatest diameter of eye. *Thorax* ♂, ♀ : Distance from anterior dorsocentral to posterior dorsocentral 0.3 the distance between two anterior dorsocentrals. *Wings* ♂, ♀ (Fig. 1F) : Indices : C-index 1.86; 4V-index 2.13; 4C-index 1.34; 5X-index 1.52. Other details regarding general features as described by Okada (1967). *Periphallalic organs* (Fig. 1G) : Anal plate ovoid, brownish, pubescent, with 22-24 bristles and about 10-12 black setae ventrally. Other details as described by Okada (1967). *Phallic organs* (Fig. 1D) : Aedeagus medially swollen, apically conical with lateral inwardly curved processes. Ventral fragma broadly rounded. Other details as described by Okada (1967). *Egg-guides* (Fig. 1E) : Lobe yellowish-brown, medially swollen, apically rounded, with 20 marginal and 4 bristle-like discal teeth. Basal isthmus long and narrow.

Specimens examined : INDIA : WEST BENGAL : Darjeeling district, Rimbick 1♂, 2♀♀, ix.1979, Coll. Singh and Gupta.

Distribution : India : West Bengal (New record) and Japan.

Subgenus *Sophophora* sturtevant

Sophophora Sturtevant, 1939, *Proc. Nat. Acad. Sci.*, 25 : 139. Type-species : *Drosophila melanogaster* Meigen.

THE MELANOGASTER SPECIES GROUP MONTIUM SUBGROUP

KEY TO INDIAN SPECIES OF THE MONTIUM SUBGROUP

1. Thoracic pleura with a broad dark brown longitudinal stripe *rufa* Kikkawa & Peng
Thoracic pleura without a broad dark-brown longitudinal stripe 2
2. Metatarsal sex-comb with about 3-7 stout teeth, second tarsal segment of the same leg with 3 similar teeth *gundensis* Prakash & Reddy
Metatarsal and second tarsal sex-combs with more teeth 3
3. Lower 2-3 teeth of the metatarsal sex-comb displaced from the axis of the remaining teeth 4
Lower 2-3 teeth of the metatarsal sex-comb not displaced from the axis of the remaining teeth 5
4. Metatarsal comb with two distinct types of teeth, upper smaller and densely packed, the lower larger and stout 6
Metatarsal comb not with two distinct types of teeth, upper and lower teeth of uniform nature 7
5. Face milky-white in male *jambulina* Prakash & Paika
Face not milky-white in male 8
6. Acrostichal hairs in 6 rows. Terminal tergites in male shiny black *nagarholensis* Prakash & Reddy
Acrostichal hairs in 8 rows. Terminal tergites in male yellow *agumbensis* Prakash & Reddy
7. Costal index about 2.4. Lower 3 teeth of the metatarsal comb largely displaced from the main axis *tricombata* Singh & Gupta
Costal index about 3.0. Lower 2 teeth of the metatarsal comb slightly displaced from the main axis *madikerii* Muniyappa & Reddy

8. Secondary surstylus with a single large tooth 9
 Secondary surstylus with two or more large teeth 10
9. Secondary surstylus tooth of almost uniform width
 *rhopaloa* Bock & Wheeler
 Secondary surstylus tooth not of uniform width 11
10. Cerci prominently black *anomelani* Reddy & Krishnamurthy
 Cerci not prominently black 12
11. Apical bristles on first and second tibiae present
 *coonorensis* Reddy & Krishnamurthy
 Apical bristles on second tibiae present *montium* de Meijere
12. Aedeagus subbasally with paired lateral black acute projections
 *trapezifrons* Okada
 Aedeagus subbasally without paired lateral acute projections 13
13. Caudal margin of hypandrium with a broadly truncate median process
 *truncata* Okada
 Caudal margin of hypandrium with narrowly projected median process
 14
14. Secondary surstylus apparently fused with the cerci 15
 Secondary surstylus separated from cerci *kikkawai* Burla
15. Acrostichal hairs in 6 regular rows 16
 Acrostichal hairs in 8 regular rows
 *mysorensis* Reddy & Krishnamurthy
16. Posterior gonapophyses with fine marginal serrations
 *brevis* Parshad & Singh
 Posterior gonapophyses without marginal serrations
 *punjabiensis* Parshad & Paika

3. *Drosophila* (*Sophophora*) *trapezifrons* Okada (Fig. 2A-D)

Drosophila trapezifrons Okada, 1966. *Bull. Brit. Mus. (Nat. Hist.) Ent. Suppl.* 6 : 93 (Nepal).

Head, ♂, ♀: Orbitals in ratio of 5:2:7. *Thorax* ♂, ♀: Sterno-index about 0.7. *Wings* ♂, ♀ (Fig. 2D): Indices: C-index 2.98; 4V-index 2.93; 4C-index 1.23; 5X-index 2.88. *Legs* (Fig. 2C): Brownish-yellow, male fore legs with two large longitudinal sex combs, metatarsal comb with 20-25 black teeth and second tarsal comb with 16-18 similar teeth. *Abdomen* ♂, ♀: Abdominal tergites yellow, 3-4 tergites with medially projected apical black bands, the remainder tergites completely black. Other details regarding general features as described by Okada (1966). *Periphalllic organs* (Fig. 2A): Primary clasper conical, outer margin concave with 6 stout teeth in a row and few setae ventrally. Secondary clasper fused to anal plate, with 2 very large and one relatively smaller, curved black medial teeth and 7-8 large pointed teeth on lateral border. Other details as described by Okada (1966). *Phallic organs* (Fig. 2B): Aedeagus somewhat conical, hairy, subapically with bunch of large hairs, medially with black, stout, outwardly curved lateral projections. Other details as described by Okada (1966).

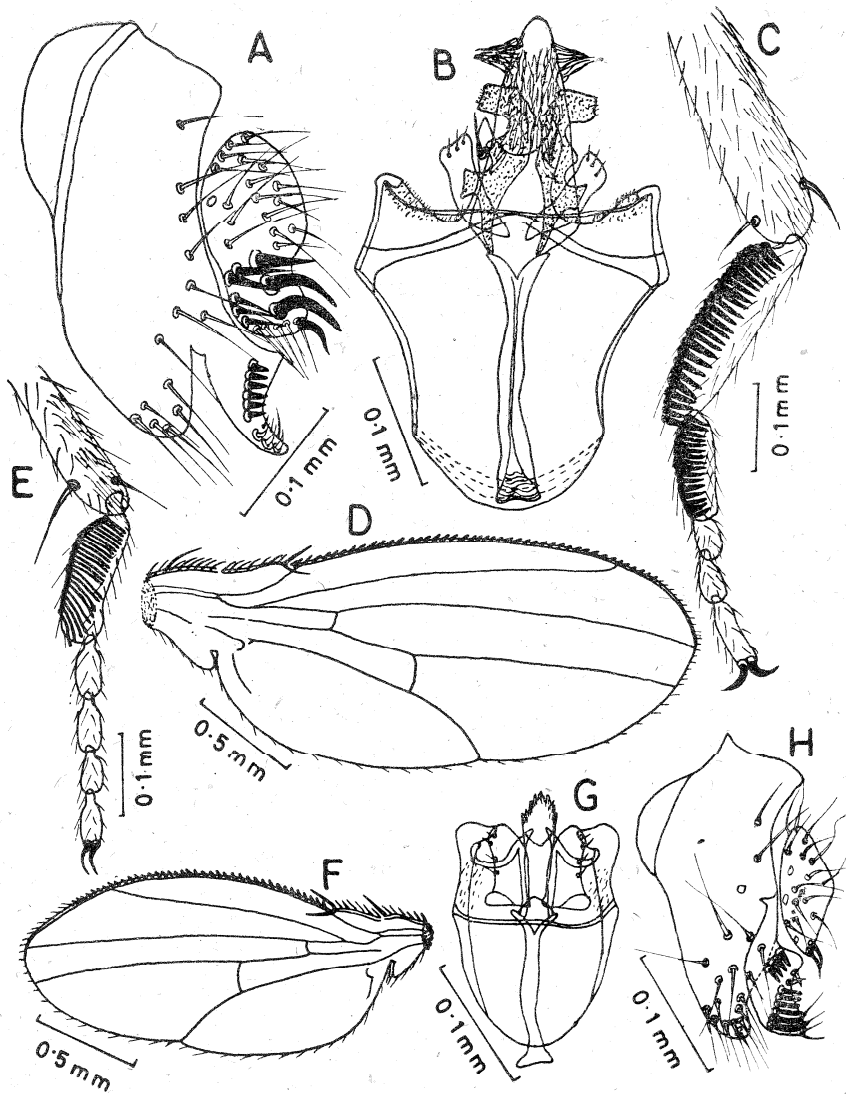


Fig. 2. A-D *Drosophila trapezifrons* Okada : A, Periphallial organs; B, Phallic organs; C, Male fore leg; D, Male wing. E-H. *Drosophila unipectinata* Duda : E, Male fore leg; F, Male wing; G, Phallic organs; H, Periphallial organs.

Specimens examined : INDIA : WEST BENGAL : Darjeeling district, Rimbick, 250♂♂, 294♀♀, ix.1979, Coll. Singh and Gupta.

Distribution : India : West Bengal (new record) and Nepal.

THE SUZUKII SUBGROUP

KEY TO INDIAN SPECIES OF THE SUZUKII SUBGROUP

1. Male fore legs unusually large and with dark brown areas *prolongata* Singh & Gupta
Male fore legs not unusually large and with no dark brown areas 2
2. Male wings with black patch 3
Male wings without black patch 4
3. Male wings with a crescentric black area along outer margin
. *tristipennis* Duda
Male wings with apical black patch 5
4. Fore legs in male with no distinct sex-combs *lucipennis* Lin
Fore legs in male with distinct sex combs 6
5. Metatarsal comb in male with five closely arranged transverse rows of teeth
. *sahyadrii* Prakash & Reddy
Metatarsal comb in male with one or two transverse rows of teeth 7
6. Metatarsal comb with 21-24 black teeth *unipectinata* Duda
Metatarsal comb with 5 long black distal teeth *immacularis* Okada
7. Costal index about 2.0. Toe with a bristle-bearing finger-like process
. *pulchrella* Tan, Hsu & Sheng
Costal index about 2.5 to 3.5. Toe without a bristle-bearing finger-like process 8
8. Fore metatarsus comb with a distally placed transverse row of teeth
. *suzukii indicus* Parshad & Paika
Fore metatarsus comb with two transverse rows of teeth *biarmipes* Malloch

4. *Drosophila* (*Sophophora*) *unipectinata* Duda (Fig.2E-H)

Drosophila unipectinata Duda, 1924, *Arch. Naturg.*, 90A : 215 (Taiwan).

Drosophila unipectinata : Sturtevant, 1942, *Univ. Texas Publ.*, 4213 : 29; Wheeler, 1949, *Univ. Texas Publ.*, 4920 : 175; Patterson and Stone, 1952, *Evol. gen. Dros.* : 16; Okada, 1954, *Kontyu*, 22 : 38; 1956, *Syst. Study Dros. Japan* : 107.

Head : ♂, ♀ : Arista with 3 dorsal and 2 ventral branches in addition to terminal fork. Frons including ocellar triangle pale-yellow. Orbitals in ratio of 3:1:5. *Thorax*, ♂, ♀ : Acrostichal hairs regular, in six rows. Anterior scutellars slightly convergent; posterior scutellars crossing each other. Distance from anterior dorsocentral to posterior dorsocentral about half the distance between two anterior dorsocentrals. Mesonotum and scutellum yellow. *Wings* : ♂, ♀ (Fig. 2F) : Indices : C-index 2.64; 4V-index 2.67; 4C-index 1.18; 5X-index 2.28. *Legs* (Fig. 2E) : Male fore metatarsal segment with a large sex-comb having 21-24 black teeth. Other details regarding general features as described by

Okada (1956). *Periphallidic organs* (Fig. 2H) : Clasper dark brown, apical margin slightly concave, with two sets of teeth; upper set with 4 stout teeth; lower one with a row of 6 comparatively larger teeth. Anal plate oblong, with 18 bristles and 2 thick pointed black bristles ventrally. Other details as described by Okada (1956). *Phallic organs* (Fig. 2G) : Basal apodeme of aedeagus slightly longer than aedeagus. Anterior parameres broad, whitish-yellow, with 4 latero-apical minute sensilla. Posterior parameres somewhat conical adjacent to aedeagus. Other details as described by Okada (1954).

Specimens examined : INDIA : WEST BENGAL : Darjeeling district, Rimbick, 6 ♂♂, ix.1979, Coll. Singh and Gupta.

Distribution : India : West Bengal (New record), Japan : Honshu (Kanto, Chubu), Kyushu and Taiwan.

Remarks : The Indian strain of *D. unipectinata* Duda slightly differs from Japanese form in having arista with 4 dorsal and 2 ventral branches in addition to terminal fork (5 long branches including a large fork in Japanese strain), clasper with two sets of teeth; upper set with 4, lower set with 6 comparatively larger teeth (in Japanese strain upper set with about 10, lower one with about 4 teeth), anal plate with 2 thick, curved, pointed, black bristles ventrally (no such bristles in Japanese strain). Other features strictly agree with those of the Japanese form.

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