

Further addition to the drosophilid fauna of  
Uttarakhand, India  
(Diptera: Drosophilidae)

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With 12 figures

**Abstract:** *Drosophila (Drosophila) analspina* n. sp., *Drosophila (Drosophila) painii* n. sp. and *D. (Drosophila) bishtii* n. sp. are described from Uttarakhand, India.

The Drosophilidae are a large family of acalyprate Diptera of world-wide distribution. The first complete catalogue of the family (Wheeler 1981) lists more than 2,500 species in 55 genera, although there can be little doubt that many more species remain to be discovered or described. In recent years, our studies particularly in the Uttarakhand region of the Indian subcontinent have yielded considerable data on the Indian species (Singh & Bhatt 1986, 1988; Singh & Negi 1989, 1992). However, the authors believe that these data in no way furnish a complete picture of the drosophilid species inhabiting this region since a vast area still awaits exploration. This paper deals with the description of three new species of the subgenus *Drosophila (Drosophila)* collected from Uttarakhand region. The Uttarakhand region is located at an elevation of about 6,000 feet from the sea level at the north-east periphery of the state Uttar Pradesh, India, and includes eight border districts viz., Nainital, Almora, Pithoragarh, Chamoli, Uttarkashi, Dehradun, Theri, and Pauri Garhwal.

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*Drosophila (Drosophila) analspina* n. sp.

Figs. 1-4

**Holotype:** ♂ (Accession No. NTL-54), Bara Patthar, Nainital Distr., Uttar Pradesh, India, VII.1989, Singh & Negi leg.

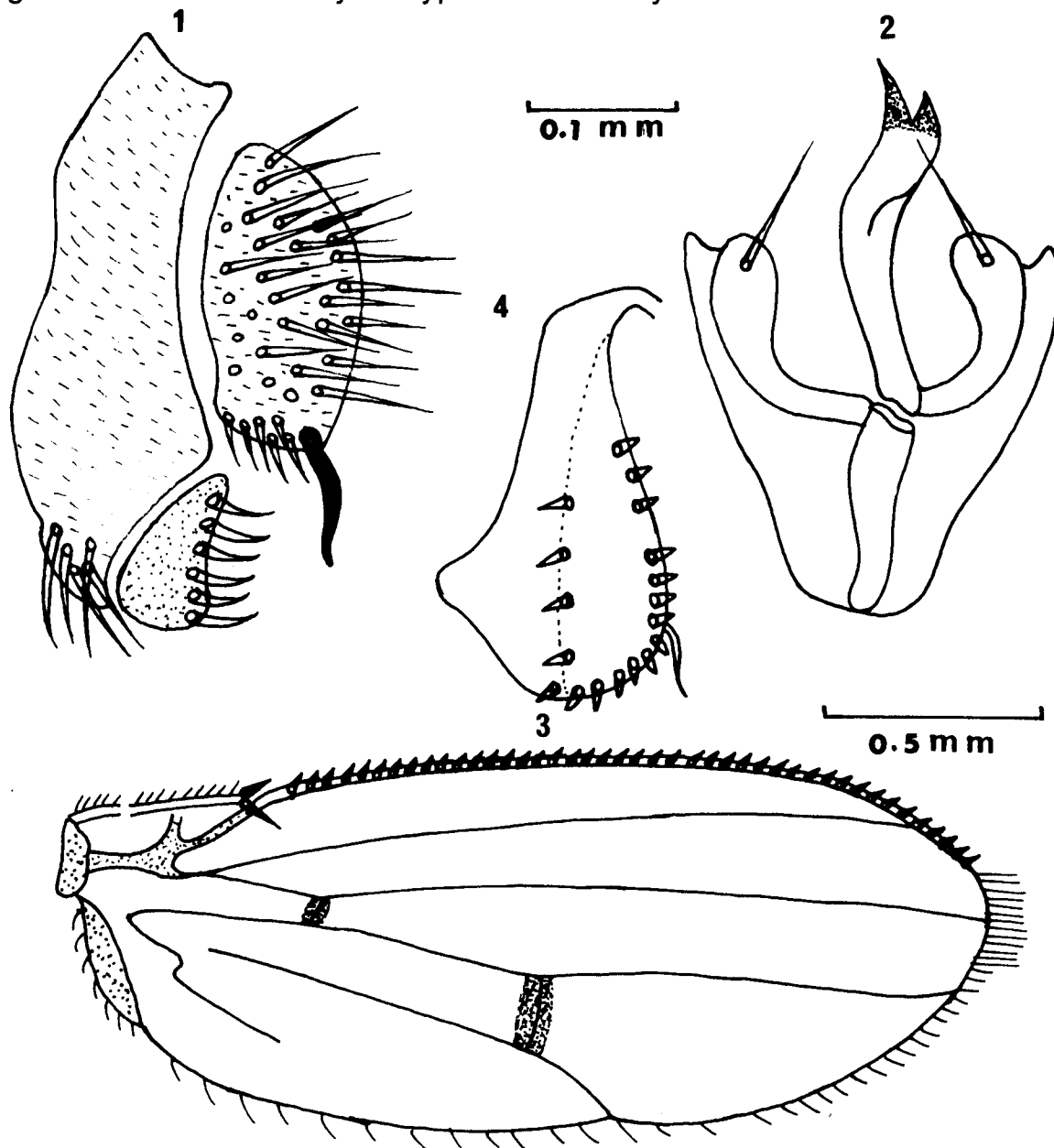
**Paratypes:** 2 ♂♂, 1 ♀ (Cytogenetics Laboratory, Nainital), 1 ♂, 1 ♀ (*Drosophila* collection, Dept. Biol. Tokyo Metropolitan Univ.), all same data as holotype.

The remaining alcoholic-preserved specimens of the paratype series (Accession No. NTL-55) along with the mounted slides of genitalia and other taxonomic structures are deposited in the Cytogenetics Laboratory,

Zool. Dept., Kumaun University, Nainital, and in the Senckenberg-Museum, Frankfurt a. M.

Diagnosis: Abdomen pale tan, tergites with brownish, narrow apical bands. Anterior and posterior cross-veins fuscous (Fig. 3).

Description: Head ( $\sigma^2$ ): Arista with 4–5 dorsal and 2–3 ventral branches in addition to the terminal fork. Antennae with segment II brown; segment III yellowish. Frons including ocellar triangle pale brown to dark brown. Orbitals in the ratio of 6:4:8. Second oral strong, nearly equal to vibrissa. Palpi yellow with 2–3 marginal setae. Carina light brown, high and broadened below. Face and cheek brown, greatest width of cheek 1/6 greatest diameter of eye. Clypeus brown. Eyes dark red.



Figs. 1–4. *Drosophila (Drosophila) analspina* n. sp. – 1) Periphallic organs; 2) phallic organs; 3) wing; 4) egg-guide.

Thorax (♂♀): Acrostichal hairs in 8 regular rows between dorsocentrals. Anterior scutellars convergent; posterior ones crossing each other. Anterior dorsocentral 2/3 length of posterior dorsocentral; distance between anterior and posterior dorsocentral 1/3 distance between two anterior dorsocentrals. Mesonotum and scutellum unicolorous, yellowish. Thoracic pleura yellowish. Humerals two, equal. Sterno-index 0.55.

Wings (♂♀): Transparent, anterior and posterior crossveins fuscous. Approximate indices: C-index 3.7; 4V-index 1.6; 4C-index 0.5; 5X-index 1.2. Halteres light brown (Fig. 3).

Legs (♂♀): Pale yellow, preapicals on all three tibiae, apicals on fore and mid tibiae. Inner surface of fore femora with row of 9–10 spinules.

Abdomen (♂♀): Abdomen yellowish, tergite with brownish, narrow apical bands.

Average length of body: 3.5 mm (♂), 3.8 mm (♀).

Periphallalic organs (Fig. 1): Genital arch pale yellow, elongate, narrowing ventrally, lower portion with 5 large stout bristles. Clasper triangular with 6 stout black teeth arranged in a concave row. Anal plate yellow, broad with about 30 large bristles and one spine like large tooth at lower tip.

Phallic organs (Fig. 2): Aedoeagus yellow, slender, apically bifid and pointed. Basal apodeme of aedoeagus subequal to aedoeagus. Anterior parameres large, club shaped, with one large apical submedian spine. Hypandrium concave. Ventral phragma nearly quadrate.

Egg-guide (Fig. 4): Lobe yellowish with 14 marginal and 4 discal teeth. Basal isthmus short and thick.

Remarks: This species belongs to *quinaria* section wherein it resembles *D. mediobandes* Dwivedi & Gupta in having the aedoeagus bifid but distinctly differs from it in having one large tooth on the posterior margin of anal plate and six large and thick bristles on the outer margin of primary clasper.

### *Drosophila (Drosophila) bishtii* n. sp.

Figs. 5–8

Holotype: ♂ (Accession No. NTL-56), Sleepy Hollow, Nainital Distr., Uttar Pradesh, India, VII.1989, Singh & Negi leg.

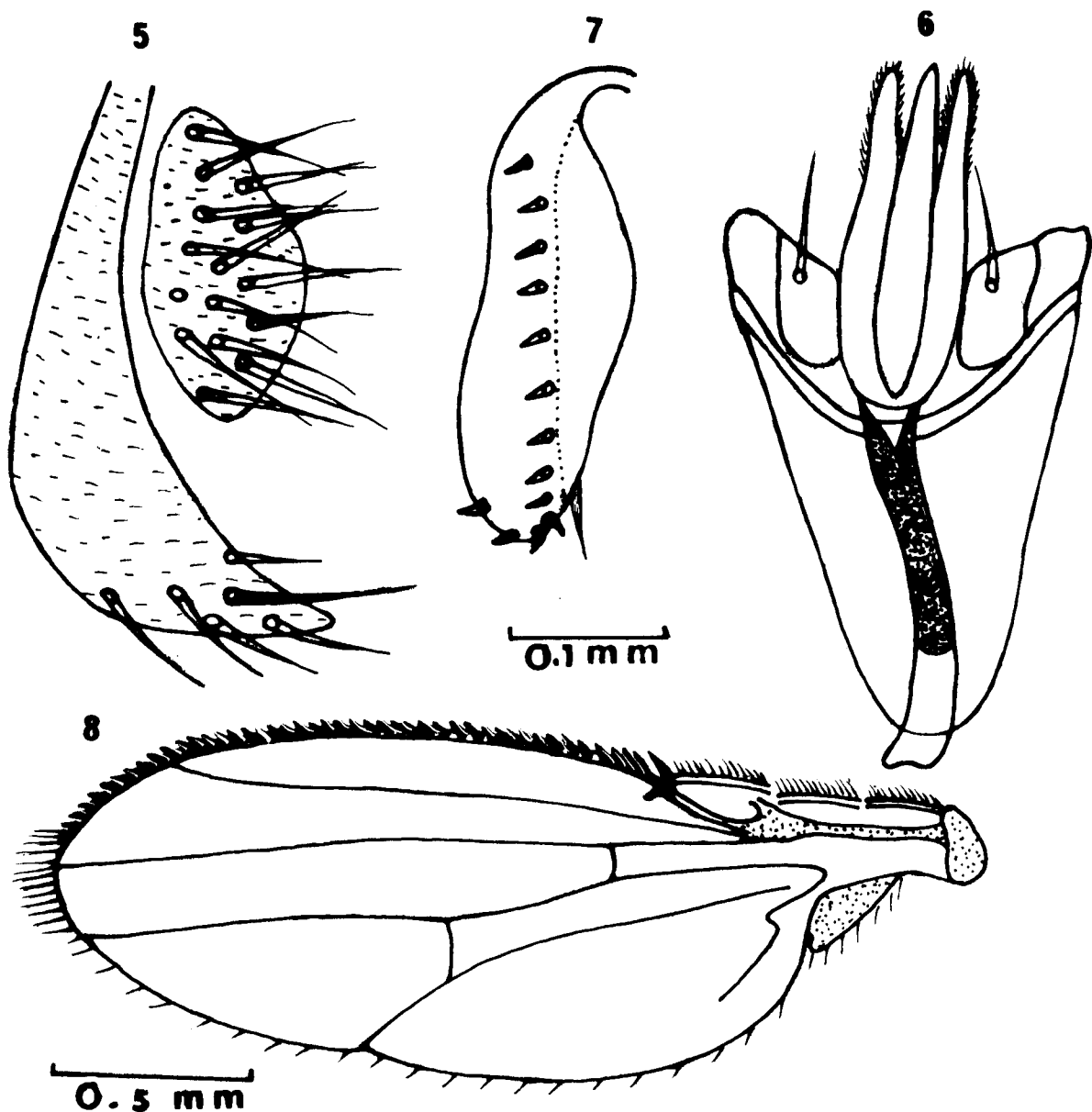
Paratypes: 2 ♂♂, 1 ♀ (Cytogenetics Laboratory, Nainital), 1 ♂, 1 ♀ (*Drosophila* collection, Dept. Biol., Tokyo Metropolitan Univ.), all same data as holotype.

The remaining alcoholic-preserved specimens of the paratype series (Accession N. NTL-57) along with the mounted slides of genitalia and other taxonomic structures are deposited in the Cytogenetics Laboratory, Zool. Dept., Kumaun University, Nainital, and in the Senckenberg-Museum, Frankfurt a. M.

Diagnosis: Yellow flies. Abdomen with narrow black apical bands slightly projected in the middle.

Description: Head ( $\sigma^{\circ}$ ): Arista with 7 dorsal and 3 ventral branches in addition to terminal fork. Antennae with segment II light brown, segment III yellowish brown. Orbitals in the ratio of 4:2:3. Frons including ocellar triangle brown. Second oral strong, nearly equal to vibrissa. Palpi light yellow, with three marginal setae. Carina yellowish. Face and cheek brown, greatest width of cheek  $1/8$  greatest diameter of eye. Clypeus light brown. Eyes bright red.

Thorax ( $\sigma^{\circ}$ ): Acrostichal hairs in 8 regular rows between dorsocentrals. Anterior scutellars convergent; posterior ones crossing each other. Anterior dorsocentrals  $3/5$  length of posterior dorsocentrals; distance between



Figs. 5–8. *Drosophila (Drosophila) bishtii* n. sp. – 5) Peripheral phallic organs; 6) phallic organs; 7) egg-guide; 8) wing.

anterior and posterior dorsocentrals 1/2 of distance between two anterior dorsocentrals. Mesonotum and scutellum unicolorous, yellowish. Humeral two, equal. Thoracic pleura light brown. Sterno-index 0.52.

Wings (♂♀): Clear. Approximate indices: C-index 2.08; 4V-index 2.3; 4C-index 1; 5X-index 1.8. Halteres light brown (Fig. 8).

Legs (♂♀): Yellow, preapicals on all tibiae, apicals on fore and mid tibiae, inner surface of fore femora with row of 11–12 spinules. Abdomen yellowish, tergites with brownish, narrow apical bands.

Average length of body: 2.8 mm (♂), 3.1 mm (♀).

Periphallic organs (Fig. 5): Genital arch yellowish brown, elongate, narrow above and broad below, ventral lobe of genital arch pointed with 5 large bristles. Clasper fused with the lower portion of genital arch with one large black spine. Anal plate separated from genital arch, oval about 15–16 large bristles.

Phallic organs (Fig. 6): Aedoeagus yellowish brown, club-shaped. Anterior parameres large, leaf like, with numerous fine sensilla. Hypandrium with a pair of large submedian spines. Basal apodeme of aedoeagus slightly larger than the aedoeagus. Ventral phragma triangular.

Egg-guide (Fig. 7): Lobe rounded at the tip, with about three marginal and 10 discal teeth. Basal isthmus short and narrow.

**Remarks:** This species is a member of the subgenus *Drosophila* of the genus *Drosophila* and resembles *D. flexicauda* Okada in having large and club-shaped aedoeagus, similar shape of anterior parameres, apodeme and ventral phragma; but drastically differs from it in having the clasper fused with genital arch.

*Drosophila (Drosophila) painii* n. sp.

Figs. 9–12

**Holotype:** ♂ (Accession No. NTL-58), Paines, Nainital Distr., Uttar Pradesh, India, VIII.1989, Singh & Negi leg.

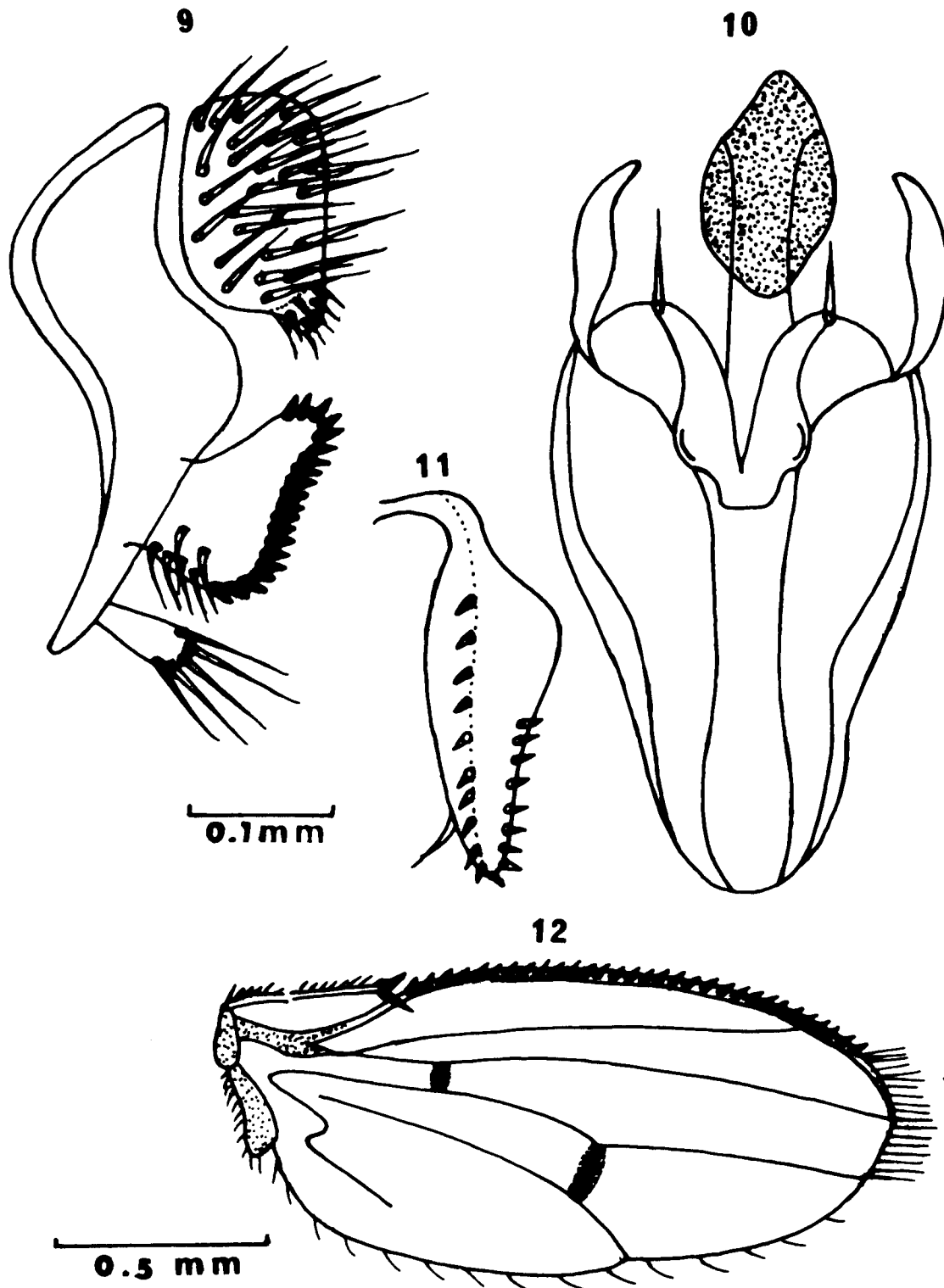
**Paratypes:** 2 ♂♂, 2 ♀♀ (Cytogenetics Laboratory, Nainital), 1 ♂, 1 ♀ (*Drosophila* collection, Dept. Biol., Tokyo Metropolitan Univ.), all same data as holotype.

The remaining alcoholic-preserved specimens of the paratype series (Accession No. NTL-59) along with the mounted slides of genitalia and other taxonomic structures are deposited in the Cytogenetics Laboratory, Zool. Dept., Kumaun University, Nainital, and in the Senckenberg-Museum, Frankfurt a. M.

**Diagnosis:** Abdomen light brown, tergites with dark brown, narrow apical bands. Wings dusky, anterior and posterior crossveins fuscous.

**Description:** Head (♂♀): Arista with 6 dorsal and 5 ventral branches in addition to the terminal fork. Antennae with segment II yellowish; seg-

ment III light brown. Frons including ocellar triangle yellowish brown. Orbitals in the ratio of 7:4:10. Anterior reclinate as close to proclinate as to posterior reclinate. Second oral strong, equal to vibrissa. Palpi light yellow, with 3–4 marginal setae. Carina light brown, narrow and high. Face and



Figs. 9–12. *Drosophila (Drosophila) painii* n. sp. – 9) Peripheral phallic organs; 10) phallic organs; 11) egg-guide; 12) wing.

cheek light brown; greatest width of cheek  $1/9$  greatest diameter of eye. Clypeus dark brown. Eyes bright red.

Thorax (♂♀): Acrostichal hairs in 8 regular rows between dorsocentrals. Anterior scutellars nearly convergent, posterior ones crossing each other. Anterior dorsocentral  $3/5$  length of posterior dorsocentral; distance between anterior and posterior dorsocentral  $1/2$  the distance between two anterior dorsocentrals. Mesonotum and scutellum unicolorous, yellowish. Humerals two, equal. Thoracic pleura light brown. Sterno-index 0.58.

Wings (♂♀): Dusky, anterior and posterior crossveins fuscous. Approximate indices: C-index 3.5; 4V-index 2.5; 4C-index 0.6; 5X-index 1.1. Two equal bristles at the apex of first costal section; heavy bristles on about basal  $1/4$  of third costal section. Halteres yellowish brown (Fig. 12).

Abdomen light brown, tergites with dark brown, narrow apical bands.

Average length of body: 4.3 mm (♂), 4.5 mm (♀).

Periphallic organs (Fig. 9): Genital arch pale yellow, elongate, narrowing ventrally, bare with a small leaf like flap having 5 long bristles at the lower portion. Clasper large, broadened distally with a set of 19–20 small black teeth on the outer margin and 6–7 small bristles. Anal plate yellow, broad dorsally, narrow ventrally with about 40–50 large bristles and 7–8 small bristles.

Phallic organs (Fig. 10): Aedoeagus yellow; slender, apically swollen. Basal apodeme of aedoeagus equal to ventral phragma. Anterior parameres large with one submedian spine. Hypandrium large and pointed. Ventral phragma nearly triangular.

Egg-guide (Fig. 11): Lobe rounded at the tip with 8 marginal and 9 discal teeth. Basal isthmus short and narrow.

Remarks: This species belongs to *quinaria* section wherein it resembles *D. acutissima* Okada in having an elongated ventral lobe of the genital arch and similar shape of the anal plate and clasper, but distinctly differs from it in the structure of phallic organs and the crossveins being fuscous.

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## Katalog des im Museum für Naturkunde in Stuttgart vorhandenen Typusmaterials der Insektenordnung Phasmatodea

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**Abstract:** A catalogue is provided of the type material of Phasmatodea (24 species) deposited in the Museum für Naturkunde in Stuttgart. All data for the material concerned are given along with taxonomic and relevant comments.

Kürzlich konnten wir die Phasmatodea-Sammlung des Museums für Naturkunde in Stuttgart fotografieren und katalogisieren. Die Sammlung umfaßt derzeit 26 Kästen mit zirka 150 verschiedenen Arten in mehr als 700 Exemplaren. In drei unnummerierten Kästen steckt noch unbearbeitetes beziehungsweise unbestimmtes Material. Von 24 Arten konnten wir Typusmaterial feststellen, das nachfolgend aufgelistet wird.

Die Unterfamilien, Gattungen und Arten sind nach Bradley & Galil (1977) geordnet. Fundorte, wenn bekannt, sind den Original-Fundortetiketten entsprechend wiedergegeben. Die Zahl in eckigen Klammern entspricht den Kastenummern der Hauptsammlung. Ist keine Kastenummer angegeben, stecken die Exemplare noch nicht in der Hauptsammlung.

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