STUDIES ON SOME INDIAN SPECIES OF THE GENUS ELAPHROTHRIPS BUFFA
(Megathripinae: Tubulifera: Thysanoptera)

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The world-wide genus Elaphrothrips Buffa includes species from the Oriental and Ethiopian regions and both Bagnall (1934, 1935) and Priesner (1934, 1935, 1952) have described, revised and formulated keys to the new and known species from these regions. In particular a large number of species have been reported by Schmutz (1913) from Ceylon. Unlike other members of the Phlaeothripidae, those of the Megathripinae, to which Elaphrothrips belongs, generally show profound sex-limited intraspecific diversity in the males, where on the basis of the study of a reasonably good series, at least three distinct categories of males could be recognised—the gynaecoid, normal and oedymerous males. Because the characters for species recognition in Oriental Elaphrothrips were hitherto based on odd males, the various forms of males each were described as different species, and, indeed, the various forms differed considerably from each other. Fundamentally the following morphological changes are evident within males of species of Elaphrothrips considering both the gynaecoid—oedymerous traits; the gynaecoid males have a shorter and weaker body, the armature of the forelegs and genal spines are very feeble, the sickle-like bristle at the apex of the forefemora are wanting, the third and fourth antennal segments are shorter and devoid of strong setae, the fewer double fringes on forewing and foretarsal tooth are very feebly developed in the extreme gynaecoid males; by contrast, the oedymerous males have a stronger build, have very prominent and strongly developed foreleg armature and cephalic and genal spines, the setae arise from prominent warts, the sickle-like bristle on forefemora is well developed (except in E. productus Priesner), foretarsal tooth is more strongly developed and exhibit two categories—a thin and straight tooth when the forefemora has a tendency to be more elongate and stout and beak-like when the forefemora is a little shorter and stouter an increase in the number of double fringes and longer antennal segments (in particular 3 and 4) with very long and strongly developed setae. With these differences, the range of measurements of the cephalic, thoracic and other body setae obviously show profound variation between the two extremes.

Studies presented here have led to firm conclusions regarding the synonymy of Elaphrothrips mucronatus Priesner, Elaphrothrips greenii (Bagnall) = E. bouvierii (Vuillet) with Elaphrothrips beesoni Ramakrishna; of E. chandana Ramakrishna, E. graveleyi Bagnall and E. eranthesi Seshadri & Ananthakrishnan with the common species of E. procer (Schmutz) and E. agasthya Ramakrishna with E. crassiceps (Bagnall). Mound (1968) in reviewing Bagnall’s collection also concluded that E. proximus (Bagnall), E. achaetus Bagnall, E. approximatus Bagnall to be outright synonyms of E. procer.

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Ananthakrishnan (1964) erected a new genus *Elaphridia* for *E. agasthya* in view of the possession by the latter of a very short cephalic production, a short head, only about 1.5–1.7 times as long as wide, absence of well developed genal bristles on warts, a heavier prothorax, absence of strong armature on the forelegs, absence of the sickle-like bristle on the apex of the forefemora, the form of the abdomen which is very broad at middle and not gradually tapering behind in all *Elaphrothrips* antennal segment 4 being longer than 3 in both sexes and in the tube being longer than the head. Further, *Elaphridia* has a typical cryptothripine appearance and combines characters of both the Cryptothripini and the Megathripini. The inclusion of another subgenus *Cradothrips* novo for *Elaphrothrips* species with a distinct forefemoral tooth in the females alone, is of particular interest in view of the males showing typical *Elaphrothrips* features with the well developed sickle-bristle on the forefemora. Three new species of *Elaphrothrips*—*E. micidus, E. secus* and *E. notabilis* and a new record to this country *E. clarispinis* Priesner are also included in this paper.

**KEY TO ELAPHRIDIA AND SUBGENERA OF ELAPHROTHRIPS BUFFA**

1. Forefemora of males without prominent armature in both sexes and without the sickle-like bristle. Head production short and genal spines weak. Abdomen not elongate and slender, but broader at middle. Tube clearly longer than head which is 1.5–1.7 × as long as wide. ............................................. *Elaphridia* Ananthakrishnan

   Forefemora in males strongly armed, with or without sickle-like bristle at apex. Head production variable and genae with well developed spines, reduced only in extreme gynaecoid males. Abdomen long and slender and evenly tapering at apex. Tube shorter than head which may be 2–3.5 × as wide ..................... *(Elaphrothrips Buffa)*... 2

2. Forefemora in males always unarmed, without any hump or tooth or conical processes on one or both margins. Oedymerous males strongly armed with a sickle-like bristle (except in *E. productus*) and inner margin of femora always straight, .........................

   Forefemora armed with a distinct tooth or with a hump ............................................. *Elaphrothrips* s. str. 3

3. Forefemora of females with a distinct tooth at middle of inner margin, males without. Oedymerous males with the typical sickle-like bristle................. *Cradothrips* n. subg.

   Forefemora of oedymerous males with a strong tubercle or hump on exterior and interior margin...................................................................................................................... 4

4. Forefemora of oedymerous males with a strongly excavated inner margin and with a stout interior basal hump and a slender hump at exterior margin. ........................................

   Forefemora of oedymerous males with inner margin not excavate, with a short hump at apex of exterior margin and with a distinct stout subdorsal hump or cone at middle of exterior margin. ............................................. *Paraklinothrips* Priesner

**KEY TO THE SPECIES OF ELAPHROTHRIPS DISCUSSED**

1. Cephalic production pronounced, about 0.9–1.2 × as long as wide. ......................... 2

   Cephalic production much shorter, distinctly wider than long, at most 0.5 × as long as wide ................................................................. 4

2. Oedymerous males devoid of sickle-like bristles at the apex of fore femora. *All tibiae* basally more brownish and yellowish beyond middle. Antennal segment 3
yellowish with a tinge of brown at apex, 4 and 5 distinctly yellowish at basal half, rest brownish. ........................................ productus Priesner
Oedymers males with distinct sickle-like bristle at apex of forefemora. .................. 3
3. Foretibiae brown, midtibiae also brown but shading to yellow at extreme apex; hindtibiae basally brown, rest yellowish. Antennal segment 3 yellow-yellowish brown at basal two-thirds, rest brownish; 4 and 5 brown. Cephalic, thoracic and basal wing bristles not very long, brownish yellow. .................. beesoni Ramakrishna
Body bristles much longer and distinctly hyaline, except these on head production. Antennal segment 3 yellow, brownish at apex, 4 and 5 with proximal halves yellow, rest brown. ........................................ micidus n. sp.
Body setae nominal, never exceptionally long. ................................................................... 5
All tibiae clearly uniformly brownish and foretsarsi of females, with a stump-like to a well developed tooth. ................................................................. 6
Body setae not hyaline, but brownish. Apex of antennal segment 3 yellowish, rest brown, 4 and 5 basally yellow, distal half brown. Basal wing bristles 58–88, 63–75, 158–200 long, with 25–29 double fringes. ........................................ procer (Schmutz)

Elaphrothrips subgenus Cradothrips nov.

The general taxonomic features as in Elaphrothrips but the forefemora in the females bear a distinct, well developed blunt tooth at middle of inner margin. Males with forefemora unarm ed and at apex with distinct sickle-like bristle.

Type-species: Elaphrothrips (Cradothrips) insignis n. sp.

Elaphrothrips (Cradothrips) insignis Ananthakrishnan, new species Fig. 1.

♀ (macropterous). Body and legs uniformly dark brown except tarsi a little paler. Antennal segments 1, 2, 6–8, extreme apex of 3, distal halves of 4 and 5 brown, rest yellow. Wings transparent excepting margins pale grayish. Body setae hyaline, blunt, except setae on head production.


Prothorax 315–332 long at middle, 299 across anterior margin, 498–575 across posterior margin; anteroangulars 65, anteromarginals 52, middorsals 114, postangulars 221 and epimerals 148–169
Fig. 1. *A-Elaphrothips* (Cradothrips) *insignis* n. sp., head and prothorax of ♀: a, antenna of ♀; b, basal wing bristles; c, fore leg of ♂.

♀ (macropterous). Color same as ♀.

at base, 116 at apex.


Total body length: 6.45–6.83 mm.


**Elaphrothrips micidus** Ananthakrishnan, new species Fig. 2.

♀ (macropterous). Body brown including legs except femoro-tibial joints, distal half of foretibiae, distal 2/3 of midtibiae and distal 3/4 of hind tibiae yellow. Antennal segments,
1, 2, 6-8 brown; 3 yellow except apex brown; proximal halves of 4 and 5 yellow, rest of 4 and 5 brown. Wings transparent, setae hyaline, except production setae which is yellowish brown, knobbed.


Total body length: 4.84–6.70 mm.


Total body length: 5.4–8.65 long.

MATERIAL: Holotype ♀, Allotype ♂ and paratypes 6 ♂♀ and 4 ♂♂ from dry leaves, Yelagiri 1200 m (Tamil Nadu), 8.X.1970.

In the coloration of the antennae and tibiae and in the nature of the head production, this species approaches *E. productus*, from which it differs in the much longer and distinctly hyaline setae and in the presence of distinct sickle-like bristles in the ecdumerous males. *E. beesoni* has a different coloration of the antennae, tibiae and body bristles.

**Elaphrothrips notabilis** Ananthakrishnan, new species Fig. 3.

♀ and ♂ (macropterous). Color dark brown. Fore and mid tibiae yellowish brown at base, more brownish at middle, apical third and tarsi brownish yellow; hind tibiae yellow in basal eighth, followed by a brownish area, rest almost yellowish. Antennal segment 1 dark, 2 dark at base, paler at apex; 3 yellow tinged brown at apex, 4 yellowish with a tinge of brown at apex, 5 proximal 2/3 yellow, rest brown. Forewings clear, all setae pale brown, knobbed, except the major setae on head production.
Head 581-598(631) long, 266(266) wide across eyes, 216(216) across cheeks below eyes and 249 (266) at base; head production 91-100(100-149) long, 149 wide; major setae on head production 239-265(179) long. Postoculbars, 249-299(237), mid-dorsal setae 166-216(205) long; cheek setae 26-33(26-28) long. Antennal segments, 3-8 length (width):

♀♀: 224-241(41-42); 207-216(42-50); 174-183(33-39); 133(29-39); 83(26-28); 75-83 (16-18).

♂♂: 249(39); 216(42); 199(34); 125(27); 83(26); 75(16).

Prothorax 315-322(315) long, 266-299(315) wide across anterior margin and 465-515(515) across posterior; anteroangulars 73-91, anteromarginals 39-52(55), midlaterals 143-172(104), postangulars 229 and epimerals 195-208(117) long. Forefemora 166-183(249) wide, foretarsus of female with a hardly discernable to a very weak blunt tooth, that of the males 66 long.

Forewings 166-183, 149-166(149, 133) wide at base and beyond middle, with 36-38 double fringes; basal wing bristles 153-171, 247-265, 312-372(143, 195, 247) long respectively.


Total body length: 5.86-6.26(5.76) mm.
MATERIAL: Holotype ♀, Allotype ♂, 5 paratype ♀♀, decaying bark, Kiruvatti forest (Mysore), 6.IX.1967.

This is a unique species characterised by the excessively long major cephalic and thoracic body setae and the basal wing bristles.

**Elaphrothrips secus** Ananthakrishnan, new species

*Macropterous* ♀ (♂): Color dark brown; foretibiae yellow at extreme ends, rest yellowish brown; midtibiae extreme base tinged yellow, basal half brown, rest yellow; hind tibiae basal third brown, rest yellow; all tarsi yellowish. Antennal segments 1 and 2 brown, 3 yellow, tinged brown at apex; 4 proximal 2/3 yellow, rest pale brown; 5 basal half yellow, rest brown. Wings clear, body setae hyaline, blunt.


♀: 155-183(41); 174-183(41); 164-166(33); 116(29-33); 66(21-25); 50-66(17)

♂: 166-232(41-50); 174-199(38-50); 166-183(33-41); 108-116(25-33); 66-74(17-25); 58-66(13-17).

Prothorax 249-266(249-365) long, 249(249-315) wide across anterior margin, 415-432(382-581) across posterior; anteroangulars 62-65(57-96); anteromarginals 39-42(52-55), midlateral 120(96-117), postangulares 120(104-117) and epimerals 122-140(117-156) long. Forefemora 133-166(133-274) wide, foretarsal tooth lacking in the two females, those of males 21-66 long.

Forewings 1743-1876(1594-1878) long, 133, 116, 116(116, 100, 100) wide respectively at base, middle and apex; double fringes on forewing 29(27-31); basal wing bristles 104-114, 117-143, 205-234(188-130, 91-114, 172-247) long.


Total body length: 4.18-5.33 (4.58-6.31) mm.

MATERIAL : Holotype ♀, Allotype ♂, Paratype ♀ and 2 paratype ♂♂, from dry twigs, Kalimpong, Darjeeling district (West Bengal), 20.IV.1969.

In the coloration of the tibiae and antennal segments 3, 4 and 5 this species approaches *E. productus*, and *E. notabilis*, but is distinctly different in the nature of the head production which is longer than wide. Both *E. clarispinis* and *E. procer* which possess a short head production, have all tibiae clearly uniformly brownish.

**Elaphrothrips beesoni** Ramakrishna

Fig. 4.


Examination of Ramakrishna's material of *E. beesoni*, paratypes of Priesner's *E. mucronatus* and the very large series of *E. mucronatus* showing striking intraspecific diversity particularly in the males, i.e. gynaecoid to oedemerous males, has led to the confirmation of the above synonymy. Based on Ramakrishna's material Ananthakrishnan (1964) recorded the range of differences between the gynaecoid and oedemerous males of *E. beesoni* and that of *E. mucronatus* in large populations comprising over 50 females and 65 males (1970). It is of particular interest to observe the frequent association between the two very closely allied species *E. mucronatus* and *E. productus* Priesner which, while showing an overlapping range in measurements, particularly in the large series of males, possess very distinct features enabling their separation, the nature of the aedeagus being strikingly different. Both *E. greeni* Bagnall and *E. bouvierii* Vuillet were based on odd males, mostly gynaecoid (cf. 'Kraftig' males Priesner 1934). As has been exemplified through study of a very large series of males of *E. productus* and *E. beesoni*, the shape, some areas of color strong bristles on antennal 3 in males, the nature of the sickle-like bristles on forefemora, the nature of the foretarsal tooth, as well as the number of double
fringes are all subject to profound variation when one goes up the series from the gynaecoid to the oedymerous, and, therefore, these characters are not tatonedrically reliable. Color gives some comparative usefulness. Although the hind tibia is yellowish in the distal half in both productus and beesoni, the foretibia is uniform brown in beesoni and more brownish yellow in productus. Further, productus can always be recognised by the lack of the sickle-like bristle even in the oedymerous males. This feature is important because in all other known species, the normal and oedymerous males have this bristle, but is either reduced or lacking in gynaecoid males. The antennal segments 4 and 5 are almost uniformly brown except for the extreme bases tinged brownish yellow, while basal halves of 4 and 5 in productus are distinctly yellowish with only their apices brownish. Considering color and lack of the sickle-like bristle it would not be feasible to retain E. greeni as a distinct species; rather it has to be sunk as an outright synonym of beesoni. Mound (1968) has correctly sunk E. bouvierii as a synonym of E. greeni.
Elaphrothrips procer (Schmutz)


This is is the most common species in India and several males and females have been recorded by me from several localities throughout Tamil Nadu (Madras, Tambaram, Kodaikanal, Nilgiris, Courtallum, etc.), throughout Kerala (Walayar forest, Tenmalai forest, Wyanad hills, Andhra Pradesh (Tirpuathi hills), Maharashtra (Poona, Nasik) and West Bengal (Kalimpong). Comparison of Ramakrishna's material of *Elaphrothrips chandana* with those of typical *dallatorensis* as identified by Priesner, as well comparison of the type material of *E. eranthemi* Seshadri & Ananthakrishnan and *E. graveleyi* (the latter through the kind courtesy of Mr Mound of British Museum (Nat. Hist.) London who provided me with data of the holotype as well as a camera lucida figure) has sufficiently confirmed the synonymy of these species with *dallatorensis*. Mound (1968) on the basis of examination of Bagnall's type specimens has treated *E. achaetus, E. approximatus* and *Dicaiothrips proximus* as synonyms of *E. procer*. Ananthakrishnan (1964) suggested the synonymy of *E. chandana* with *E. beesoni* from the then available damaged material, but with the further availability for comparison of slightly better material, its synonymy with *dallatorensis* stands more to reason than with *beesoni*. For casual observation both *E. clarispinis* of Priesner, *Elaphrothrips procer dallatorensis* appear closely related, but are distinct in the antennal coloration, in the nature of bristle colors, in the arrangement of the basal wing bristles, with in *clarispinis*, B2 being shorter than B1 and B3.

Elaphrothrips clarispinis Priesner

Two species were described with same specific name (Priesner, 1935, Bagnall 1935). In view of Priesner's species being based on material collected in 1923, the name *clarispinis* is retained while that of Bagnall (1928) has been renamed *bagnallianus* (Priesner 1952). The species *E. clarispinis* is being recorded for the first time from the Indian mainland and the discovery of females of this species for the first time and of more males add considerably to our knowledge to the range of variation of this species.

♀ (macroperous): Body uniformly brown including legs and antennal segments except 3 which is grayish yellow with apex brown. Wings transparent excepting a pale brown streak from base to middle. Setae hyaline, except the setae production brown, almost blunt.


Total body length: 5.20-6.70 mm, & (macropterous): Coloration as in $.

Head 688-744 long, 298-316 across eyes, cheeks and base. Head production 63-83 long, 149-166 wide; antecocular or production setae 149-199 long. Postoculars 156 long, mid-dorsals 158, knobbed. Eyes as in female. Antennal segments, length (width): 74-78(65-68) ; 93-97(56-69) ; 242-251(53-55) ; 205-214(53-55) ; 186-195(50-52) ; 70-74(31-33) ; 70-74(20-22) ; sense cones as in female. Moutchone 242-250 long, 93 across apex.


Total body length: 6.04-6.51 mm.


Elaphridia crassiceps (Bagnall) Fig. 6.

Dicaiothrips crassiceps Bagnall, 1921, A. M. N. H. (9) 8 : 399.—Ramakrishna & Margabanhu, 1940, Cat. Indian Insects, Thysanoptera, 25.


Elaphrothrips agasthya Ramakrishna, 1934, Indian For. Rec. 20 (4) : 10-11; New synonym.


In view of E. agasthya becoming a synonym of Elaphrothrips crassiceps Bagnall, the type-species of the genus Elaphridia becomes Elaphrothrips crassiceps (Bagnall). The essential range of measurements of both sexes are provided below, as data on this species are lacking.

Macropterous $ (♀)

Head 415-448(345) long, 232-257(232) across eyes, 232-266(232) across cheeks and 216-257(216) at base. Postoculars 130-156 (138) long. Antennal segments 3-8, length (width):

♀ : 130-143 (36-39) ; 138-161(36-42) ; 125-135(34-39) ; 83-91(29-34) ; 52-60(23) ; 55-65(13).

♂ : 120(36) ; 127(39) ; 114(36) ; 81(31) ; 49(23) ; 49(13).

Prothorax 249(183) long, 262-332(267) wide across anterior margin and 448-498(398) across posterior ; anterocoxals 68-88(78) ; antromarginals 2942(18), midlaterals 78-91, postangulars 78-104(91) and epimerals 130-156(125) long. Forefemora 156-183 (133) wide, foretarsal tooth 21-50(26) long. Forewings 1245-1461 long, with 24-27 double fringes. Basal wing bristles 60-70, 83-112, 130-138(65, 73, 125) long.

Abdomen 664-830(614-631) wide at base, 647-780(564-581), 282-415(315) across VIII. B1-B3 of
Fig. 6. *Elaphridia crasiceps* (Bagn.) A-head and prothorax of ♀.

IX 382-398(332-349), 332-365(282-332) and 382-432(332-349). Tube 365-464(332) long, 97-116(83), 91-100(75) and 58-66(50) wide respectively at base, middle and apex.

Total body length: 3.05-3.72(2.9) mm.


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**REFERENCES**


