An annotated checklist of Horseflies (Diptera: Tabanidae) from India with remarks on Surra disease vectors

**Authors:** Aniruddha Maity, Atanu Naskar, Jayita Sengupta, Surajit Hazra, Panchanan Parui, Sumit Homechaudhuri, Dhruti Banerjee

**Abstract**

Tabanids are one of the representative groups of brachyceran insects under order Diptera and family Tabanidae as they have two wings, haltere, sickle shaped antennae, pulvilliform empodium and their 4th and 5th radial veins terminate on opposite side of the wing. Tabanids are known for their furious bite followed by annoying sensation. Their haematophagy makes them economically important as a serious pest for domestic and wild lives. Several viral, bacterial and protozoan diseases are reported to be transmitted by around 20 species of vector tabanids from India. Among all other diseases, Trypanosomiasis (locally called ‘Surra’) is one of the most prevalent protozoan diseases in Indian sub-regions and causes serious threats to livestock and wild animal mortality. In India, 14 species are reported as Surra disease vectors. Worldwide the Family Tabanidae has 4406 known species in 137 genera (Pape T et.al. 2013) and is represented by 310 species in 20 genera in Oriental region. Existing checklist of Tabanidae from India reported the presence of 244 species under 15 genera and 3 subfamily. Here an updated checklist of Tabanidae has been provided with 247 species and 1 subspecies belonging to 14 genera in 6 tribes and 3 subfamilies. Old names have been modified to update the current list.

**Keywords:** Tabanidae, Updated checklist, Surra disease, Vector, India

**1. Introduction**

Tabanidae is a family of order Diptera, suborder Brachycera, Infraorder Tabanomorpha and Superfamily Tabanoidea under classification scheme of Marshall, 2012. They are differently named as horse flies (Tabanus), deer flies (Chrysops), or clegs (Haematopota) depending upon different genera from where they belong to. These robust and sturdy flies are strong fliers and exhibit body size ranging from 5 to 33 mm. Adults of males feed on nectar, while females exhibit both haematophagous as well as nectarophagous feeding habit. Blood meal is necessary to carry out gonotrophic cycles in female Tabanids except for those who exhibit autogeny, a process where usually single gonotrophic cycle can be completed without any blood meal. Males and females of the species are sexually dimorphic and show striking differences in the arrangement of eyes, which is used as differentiating characters. Females are dichoptic where eyes are separated by frons while males are holoptic where eyes are contiguous. Key diagnostic characters of this family are presence of annulate antennae forming sickle shape, presence of pulvilliform empodium. 4th and 5th posterior vein diverge at the wing tip to form an open ‘V’, discal cell longer than wide and wing with enlarged lower calypter.
2. Life cycle stages
Mature larvae of Tabanidae are usually 12-50 mm long, colour varies from white to green, cylindrical, elongate, and fusiform, with a pigmented, retractile, sclerotized head capsule, 3 thoracic and 8 abdominal segments, and a terminal respiratory siphon postero-dorsally. The first 7 abdominal segments usually have 3 or 4 pairs of pseudopodia anteriorly. Larvae of most species of Tabanidae are carnivorous except first and second instars which are non-feeding \[13\], while majority of Chrysops larvae are saprophagous. Pupation usually occurs in drier soil near the larval habitat. The pupal period varies from approximately 1 to 3 weeks and is temperature-dependent \[38\].

Pupae of Tabanidae are usually 10-33 mm long; usually having various shades of colour from brown to nearly black, obtect, arched dorsally, and elongate. The head and thorax are closely appressed. Eight abdominal segments are present, the last terminating in an aster composed of 3 pairs of pointed, sclerotized tubercles. Abdominal segments II-VII bear 1 or 2 rows of fringe spines posteriorly on all sclerites except in the species of genus Silvius Meigen, 1820.

Adult tabanids of females are generally haematophagous, known for their noxious bite in both wild and domestic cattle and vast range of livestock including birds, mammals even human, while males generally prefer to feed on plant extracts and nectars.

3. Habitat & Habitat
They are largely seen in warm days with low wind speed. Their abundance remains very high during monsoon \[1\] Their preferred habitat seemed to be bushy areas or grassland near aquatic body. Females are often found nearby their hosts, mostly seen in and around cattle in village areas. Adults generally take rest on tree trunks after feeding. They are all diurnal in habit and found to breed near aquatic bodies \[18\].

4. Vector potentiality
Tabanids are known to transmit around 80 different types of viral, bacterial and protozoan diseases. Among them trypanosomiasis, loaloa, anthrax are prevalent and at the same time even cause fatal in some cases left untreated \[29\]. They are responsible for economical loss in dairy industry as their easy targets are domestic cattle across the rural belts of several states in this country \[19\]. Thus they have become the flies of medical and veterinary importance and cause serious hazards to livestock and wild animals \[4\]. Checklist of Tabanidae and vector tabanids need to be updated in order to prepare control measure for successful prevention of Trypanosomiasis, one of the most potent and deadly diseases transmitted by these flies in India.

5. Trypanosomiasis or Surra disease
Trypanosomiasis is a disease characterized by high fever, skin lesion, anaemia, and weight loss. The disease is mainly prevalent in cattle, horse, camel and other domestic animals and transmitted by several vector species of tabanid flies \[3\]. The disease was originated from Africa and Trypanosoma evansi (Steel, 1885) was the first mammalian trypanosome to be described in 1880 by Griffith Evans in blood of Indian equines. First case study of trypanosomiasis in India was described in camel by Basu, Menon & Sen Gupta \[9\]. There are several case studies of trypanosomiasis transmission in cattle and other live stocks. Investigation of the death of 13 tigers including 12 white tigers in Nandan Kanan Zoo, Orissa was found to be caused by trypanosomiasis transmission and several vector species were also found from the study area \[80\]. First case report of trypanosomiasis in human was reported in 2005 in a farmer of Nagpur, Maharashtra \[72\]. A recent outbreak of this disease was reported in cattle of Ludhiana, Punjab \[72\]. Several serological test and lymph examination using Haematocrit Centrifuge Technique (HCT) or Dark Ground buffy coat (DG) technique were used earlier for disease diagnosis \[40\].

Varying sensitivity of the test and failure to detect trypanosomes if number of parasites were too low depict limitation of parasitological diagnosis. However antigen ELISA was shown to have high diagnostic sensitivity \[43\]. Trypanosomiasis was distributed mainly in Neotropical, Ethiopian, Oriental, Palearctic region, evident from distribution map found in the review literature \[21\]. Although it has potential to spread in Australia and Bismarck arch of Australasian oceanian region due to presence of few potent vector species of surra disease in those regions. Use of drugs viz. Quinapyramine sulphate (sub cutaneous dose) at 3-5 mg / kg body weight would be effective to kill trypanosomes in blood tissues while the use of arnicyde prosalt (1.5 parts quinapyramine sulphate and 1 part quinpyramine chloride) resulted in prophylactic effect and that lasts for 3 months. Diminazene was found to be very effective especially in case of buffaloes.

6. Taxonomic research
The Indian Tabanidae was studied which included a species and described from India herself earlier in 1798 by Fabricius \[23\], who has later added three more species \[24\]. Subsequently, in the nineteenth century, Wiedemann \[86, 87\], Macquart \[33, 34, 35, 36\], Saunders \[62\], Walker \[83, 84, 85\], Schiner \[63\] and Bigot \[6, 7\] have described several species from different parts of India. With the beginning of the twentieth century, Ricardo \[54, 55, 56, 57, 58, 59, 60, 61\] has contributed much to the Indian fauna and her outstanding contribution of 1911 is the
most important source of reference till today. Besides, Brunetti [8], Surcouf [79], Austen [3], Senior-White [68, 69, 70, 71], Enderlein [23], Szilady [76], Schuermans Stekhoven [64, 65, 66], Krober [30], Basu, Menon & Sen Gupta [5], Philip [47, 48, 49, 50, 51, 52], Philip & Mackerras [53], Mackerras [31], Sen & Fletcher [67], Chva‘la [12], Stone & Philip [73], Stone [74], Datta & Biswas [14], Datta & Das [45], Datta [16, 17] and Veer [79] have also made commendable works by describing and recording species occurring in India. A check-list of Tabanidae hitherto known, is provided synoptically in order to have a general idea of the faunal composition in India after Datta [18]; Vasudeva [78]; Mitra [40]. For further details and better-understanding, the reader is referred to the works by Stone &. Philip [73], Joseph & Parui [25], Stone [74], Joseph & Parui [26], Moucha [42], Burton [11], Burger [9] and Burger & Thompson [10], Datta [17, 18, 19], which incorporated species from India too.

Kapoor et al. produced annotated list on horseflies and listed a total of 222 tabanid species including 15 new species from India in 1990 [28]. Later they proposed new name Philipota for Philipomyia. Recently Veer [81] produced a detailed catalogue on Horseflies from Indian sub-region. Later Vasudeva [78] produced a list of Tabanidae from India with notes on disease vectors and listed a total of 239 species in 14 genera. More recently, Mitra [39, 40] made some contributions on Indian tabanids by producing list of tabanids where a total of 244 tabanid species in 15 genera were listed from India. But there are still many more tabanid species to be recorded and described from India. Besides that there are lots of current literatures available after surveying those literatures total numbers of tabanids available from India and their current taxonomic nomenclatures and systematic positions are validated for producing the current updated synoptic list.

7. Gap area & Objective of the present study
Despite high economic importance of tabanids as pests and disease vectors, taxonomic studies on the family Tabanidae are not sufficiently advanced, and the family is considered one of the least studied in Diptera [32] and neglected as subject of interest [21]. Well reported potential as well as established mechanical vectors of Surra disease and prevalence of several vector tabanid species in India is evident [80]. It was imperative to survey at this juncture and investigate the occurrence of any new species as potential vector for surra disease and the status of the already reported ones from India for designing quarantine plan in future. With this aim, we have cross checked and surveyed several literatures and prepared an updated checklist of species of Tabanidae family from India. The study has future scope to serve as a valuable database in designing control plans and management of Surra disease.

Horseflies belong to one of the specious families of Tabanidae under order Diptera, having 4406 species under 137 genera known from worldwide [45]. Previous checklist of Tabanidae [40] recorded 244 species under 15 genera, 3 subfamilies and 7 tribes from India. Since many of the tabanids are synonymised and several are recorded recently from India till then, thereby enhancing importance of producing updated and annotated list of tabanids from India.

8. Materials and Methods
Present list has been prepared based on recent taxonomic changes after Alan Stone [74] and Daniels [20]. Several literatures were studied to cross check existence and validity of scientific names viz. Vasudeva [78], Thomson reuters [77], and currently available literatures, keeping in mind the recent nomenclatural and classificatory changes in Morita [41], Marshall [37], Pape and Evenhuis [44], and Pape and Thompson [45].

9. Results
9.1 Checklist
Order Diptera (Linnaeus, 1758)
Suborder Brachycera (Macquart, 1834)
Infraorder Tabanomorpha (Hennig, 1948)
Superfamily Tabanoidea (Latreille, 1802)
FAMILY TABANIDAE (Latreille, 1802)
Subfamily Pangoniinae (Grunberg, 1906)
Tribe Philolicchini (Mackerras, 1954)

PHILOLICHE Wiedemann, 1820 [7 Species]
Philoliche amboinensis (Fabricius, 1805)
Type location: Amboina, Moluccas
Distribution: Oriental region (India: Maharashtra, Sikkim; Indonesia)

Philoliche haroldi Chvala, 1969
Type location: Tambi Kosi, Nepal
Distribution: Oriental region (India: Assam; Nepal)

sg. Philoliche Wiedemann, 1820
Philoliche korosicsomana (Szilady, 1926)
Type location: Darjeeling, West Bengal, India
Distribution: Oriental region (India: West Bengal; Nepal); Palearctic region (China)

Philoliche longirostris (Hardwicke, 1823)*
Type location: Nepal
Distribution: Oriental region (India: Assam, Gujrat, HP, Kerala, Meghalaya, Sikkim, Uttarakhand, West Bengal; Nepal); Palearctic region (China)

Philoliche macquartiana Chvala, 1969* = Philoliche rufa Macquart, 1850
Type location: Mahabaleswar and Matheram, Mumbai, India
Distribution: Oriental region (India: Maharashatra)

Philoliche taprobanes (Walker, 1854)*
Type location: Sri Lanka
Distribution: Oriental region (India: Tamil Nadu; Sri Lanka)

Philoliche varipes (Ricardo, 1911)*
Type location: Nepal
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Kerala, Sikkim, West Bengal; Nepal)

Subfamily Chrysopsinae (Lutz, 1905)
Tribe Chrysopsini (Lutz, 1905)

**CHRYSOPS** Meigen, 1803 [13 Species ]

*Chrysops designatus* Ricardo, 1911*
Type location: Sarah, Nepal; Jaulasal, Nainital district, India
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Kashmir, UP, Uttarakhand, West Bengal; Myanmar; Nepal; Pakistan); Palearctic region (China)

*Chrysops dispar* (Fabricius, 1798)* = Chrysops bifasciatus Macquart, 1838 = Chrysops impar Rondani, 1875 = Chrysops ligatus Walker, 1848 = Chrysops manilensis Schiner, 1868 = Chrysops semicirculus Walker, 1848 = Chrysops semicurculus Walker, 1848 = Chrysops terminalis Walker, 1848 = Haematopota lunatus Griffith and Pidgeon, 1832
Type location: “India Orientalis”
Distribution: Oriental region (India: Andaman island, Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Manipur, Meghalaya, Nagaland, Orissa, Sikkim, Tripura, West Bengal; Bangladesh; Java; Laos; Malaysia; Myanmar; Nepal; Pakistan; Philippines; Singapore; Sri Lanka; Sumatra; Taiwan; Thailand; Vietnam); Palearctic region (China)

*Chrysops dubiens* Philip, 1979
Type location: Ponnudi, 3500 ft. Kerala, India
Distribution: Oriental region (India: Kerala, Tamil Nadu; Sri Lanka)

*Chrysops fasciatus* Wiedemann, 1821* = Chrysops rufitarsis* Macquart, 1847
1821. Chrysops fasciatus Wiedemann, Dipt. Exot., p. 103.
Type location: Java (ZMUC)
Distribution: Oriental region (India: Andaman Island; Indonesia; Malaysia; Thailand; Vietnam)

*Chrysops fixissimus* Walker, 1856* = Chrysops testaceicollis* Meijere, 1911 = Chrysops unizonata Rondani, 1875
Type location: Sarawak, Malaysia
Distribution: Oriental region (India: Unknown; Borneo; Java; Malaysia; Philippines; Sri Lanka; Sumatra)

*Chrysops flaviventer* Macquart, 1846 = Chrysops v-nigrum Meijere, 1911
Type location: India (BMNH)
Distribution: Oriental region (India: Maharashatra; Cambodia; Indonesia; Malaysia; Sri Lanka; Thailand; Vietnam)
Chrysops flavocinctus Ricardo, 1902*
Type location: Khasi hills, Assam (BMNH)
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Meghalaya, Sikkim, Uttarakhand; Borneo; Laos; Malaysia; Taiwan; Thailand); Palearctic region (China)

Chrysops indianus Ricardo, 1902
Type location: Khasi hills, Meghalaya; Nilgiri hills, Tamil Nadu
Distribution: Oriental region (India: Meghalaya, Tamil Nadu; Thailand)

Chrysops pellucidus Fabricius, 1805*
1805. *Chrysops pellucidus* Fabricius, *Syst. Antl.*, p. 113
Type location: Tranquebar, India (ZMUC)
Distribution: Oriental region (India: Kerala, Orissa, Pondicherry, Punjab, Tamil Nadu; Borneo)

Chrysops pettigrewi Ricardo, 1913*
Type location: Urkul, 6400 ft., Manipur, India
Distribution: Oriental region (India: Assam, Manipur, Sikkim); Palearctic region (China)

Chrysops silviaris Philip and Mackerras, 1960
Type location: Pangwai, 5000 ft. Shan states, Burma (BMNH)
Distribution: Oriental region (India: Unknown; Myanmar)

Chrysops stimulans Walker, 1850
Type location: East India (BMNH)
Distribution: Oriental region (India: Assam, Bihar)

sg. Chrysops Meigen, 1803

Type location: (? Europe) (MNHN)
Distribution: Ethiopian region (Iran, Iraq, N Africa, S Europe); Oriental region (Afghanistan; India: Jammu and Kashmir, Punjab; Pakistan); Palearctic region (C Asia)

MELLISOMORPHA Ricardo, 1906 [1 Species]

Melissomorpha indiana Ricardo, 1906
Type location: Rungaroom, Darjeeling, West Bengal, India
Distribution: Oriental region (India: West Bengal)

SILVIUS Meigen, 1820 [2 species]
sg. Silvius Meigen, 1820

Silvius indianus Ricardo, 1911**
Type location: Bhura, Nainital district, N India
Distribution: Oriental region (India: Uttarakhand)

Silvius ornatus Philip and Mackerras, 1960
Type location: Nam Tamai Valley, Upper Burma
Distribution: Oriental region (India: Arunachal Pradesh; Myanmar)

Tribe Rhinomyzini Enderlein, 1922

GASTROXIDES Saunders, 1842 [2 Species]

Gastroxides ater Sauber, 1842*
Type location: Central India
Distribution: Oriental region (India: Bihar, Tamil Nadu, UP, West Bengal; Sri Lanka)

Gastroxides ornatus (Bigot, 1859)*
Type location: Sri Lanka
Distribution: Oriental region (India: Tamil Nadu; Sri Lanka)

Subfamily Tabaninae (Latreille, 1802)

Tribe Tabanini (Chainey & Oldroyd, 1980)

ATYLOTUS Osten Sacken, 1876 [4 Species]
Atylotus agrestis (Wiedemann, 1828) = Tabanus albicans Macquart, 1834 = Tabanus bipunctatus Wulp, 1885 = Tabanus ditoeniatus Macquart, 1838 = Tabanus lacustris Ghidini, 1938 = Tabanus pyrrhus Walker, 1850
Type location: Egypt (BMNH)
Distribution: Ethiopian region (Africa, Egypt, Iraq, Iran, Libya, Madagascar, Mauritius, Morocco, Portugal, Saudi arabia, South Yemen, Spain); Oriental region (India: Assam, Bihar, Haryana, Kerala, MP, Orissa, Punjab, Sikkim, Tamil Nadu, UP, Uttarakhand, West Bengal; Bangladesh; Pakistan; Sri Lanka); Palearctic region (China; Hongkong; Japan)

Atylotus cryptotaxis Burton, 1978
Type location: Loei prov. Thailand (CUIC)
Distribution: Oriental region (India: Assam, Orissa, UP, Uttarakhand; Thailand)

Atylotus sudharensis Kapoor, Grewal and Sharma, 1991
Type location: Sudhar, Ludhiana, Punjab (NPCD)
Distribution: Oriental region (India: Punjab)

Atylotus virgo (Wiedemann, 1824)* = Tabanus albulus Walker, 1850 = Tabanus puella Walker, 1850
1824. Tabanus virgo Wiedemann, Analecta. Entomol., p. 22.
Type location: “Indies Orientalis”
Distribution: Oriental region; India (Andaman island, HP, MP, Punjab, Uttarakhand, West Bengal; Pakistan; Sri Lanka)

HYBOMITRA Enderlein, 1922 [11 Species and 1 Subspecies]

Hybomitra bouvieri Philip, 1979
Type location: Burma
Distribution: Oriental region (India: Sikkim; Myanmar; Nepal)

Hybomitra burgeri Kapoor, Grewal and Sharma, 1991

Type location: Diary complex, PAU, Ludhiana, Punjab, India
Distribution: Oriental region (India: Punjab)

Hybomitra himalayana (Enderlein, 1925)
Type location: Himalaya, N India
Distribution: Oriental region (India: North)

Hybomitra hirta (Walker, 1850)*
Type location: East India
Distribution: Oriental region (India: HP, Uttarakhand)

Hybomitra kalatopensis Kapoor, Grewal and Sharma, 1991
Type location: Kalatop, Chamba District, HP, India
Distribution: Oriental region (India: HP)

Hybomitra khazziarensis Kapoor, Grewal and Sharma, 1991
Type location: Khazziar, HP, India
Distribution: Oriental region (India: HP)

Hybomitra lamades Philip, 1961
Type location: Makalu, E Nepal
Distribution: Oriental region (India: Sikkim; Myanmar; Nepal); Palearctic region (China)

Hybomitra peculiaris (Szilady, 1914) = Hybomitra kashmirianus Szilady, 1926 = Tabanus inequeatus Austen, 1923 = Tabanus kroeberi Szilady, 1926
Type location: Uzbekistan. Djarkent and Russia.
Distribution: Ethiopian region (Greece; Iran; Iraq; Palestine; Romania); Oriental region (India: Kashmir; Afghanistan); Palearctic region (China; Middle Asia; Mongolia; Russia)

Hybomitra subcallosa (Ricardo, 1911)*


TABANUS Linnaeus, 1758 [121 species]


Tabanus biswasi Datta, 1980**

Type location: Drang Dzong, Kameng, Arunachal Pradesh, India Distribution: Oriental region (India: Arunachal Pradesh)

Tabanus bromius Linnaeus, 1758* = Strabana simplex Muschamp, 1939 = Tabanus anthophilus Loew, 1858 = Tabanus bronicus Gimmerthal, 1847 = Tabanus connexus Walker, 1856 = Tabanus flavofemoratus Strobl, 1909 = Tabanus glaucescens Schiner, 1862 = Tabanus glaucus Meigen, 1820 = Tabanus nigricans Szilady, 1914 = Tabanus scalaris Meigen, 1820 1761. Tabanus bromius Linnaeus, Fauna Suecica, p. 463. Type location: Europe Distribution: Ethiopian region (Europe, Iran, Iraq); Oriental region India (HP); Palearctic region (C Asia)


Tabanus dorsiger Wiedemann, 1821* = Tabanus ochrophilus Lutz, 1914 = Tabanus secundus Walker, 1848 = Tabanus triceps Thunberg, 1827 1821. Tabanus dorsiger Wiedemann, Diptera Exotica, Kiliae, pp. 43-50, 101. Type location: Brazil Distribution: Neotropical region (Mexico to Argentina; Trinidad); Oriental region (India: Orissa, West Bengal)


Type location: Hisar, Haryana, India
Distribution: Oriental region (India: Haryana, MP, Rajasthan)

Tabanus kamengensis Datta and Das, 1978*
Type location: Drang Dzong, Arunachal Pradesh, India
Distribution: Oriental region (India: Arunachal Pradesh)

Tabanus kumaonensis Kapoor, Grewal and Sharma, 1991
1991. Tabanus kumaonensis Kapoor, Grewal and Sharma, Taxonomic studies of Indian Tabanids, PAU, Ludhiana, p. 94.
Type location: Mukteswar, Kumaon, India
Distribution: Oriental region (India: Uttarakhand)

Tabanus kumrakomensis Kapoor, Grewal and Sharma, 1991
Type location: Kumrakom, Kerala, India
Distribution: Oriental region (India: Kerala)

Tabanus lentis Stone, 1972
Type location: Siam, Thailand
Distribution: Oriental region (India: Assam; Thailand)

Tabanus meghalayensis Datta and Biswas, 1977**
Type location: Garo hills, Meghalaya, India
Distribution: Oriental region (India: Meghalaya)

Tabanus miniatus Datta and Biswas, 1977**
Type location: Garo hills, Meghalaya, India
Distribution: Oriental region (India: Arunachal Pradesh, Meghalaya)

Tabanus nigrifascies (Bigot, 1892)
Type location: India
Distribution: Oriental region (India: Unknown)

Tabanus rufiventris Fabricius, 1805 = Atylotus assamensis Bigot, 1892 = Tabanus crassus Walker, 1850 = Tabanus leucosparus Bigot, 1890 = Tabanus sanguineus Walker, 1850
Type location: India Oriental
Distribution: Oriental region (India: Assam, Meghalaya; Indonesia)

Tabanus subbasalis Kapoor, Grewal and Sharma, 1991
Type location: S Andaman, India
Distribution: Oriental region (India: Andaman island)

Tabanus subcrassus Kapoor, Grewal and Sharma, 1991
Type location: Hutway, Andaman, India
Distribution: Oriental region (India: Andaman island)

sg. Tabanus Linnaeus, 1758

Tabanus abscondens Walker, 1860
Type location: Myanmar
Distribution: Oriental region (India: Chattisgarh; Myanmar)

Tabanus abbreviatus (Bigot, 1892)*
Type location: Java
Distribution: Oriental region (India: WB; Bangladesh; Cambodia; Java; Malaysia; Myanmar; Pakistan; Taiwan)

Tabanus acallus Szilady, 1926
Type location: India (Sikkim)
Distribution: Oriental region (India: Sikkim, WB)

Tabanus albocostatus (Bigot, 1892)
Type location: India (BMNH)
Distribution: Oriental region (India: Uttarakhand)

Tabanus albofasciatus Ricardo, 1911*
Type location: India (Shillong, Assam)
Distribution: Oriental region (India: Meghalaya, Sikkim)

*Tabanus altermaculatus* Ricardo, 1913
Type location: Ukhrul, Manipur, India
Distribution: Oriental region (India: Manipur; Myanmar)

*Tabanus andamanicus* (Bigot, 1892)
Type location: Andaman island, India
Distribution: Oriental region (India: Andaman island)

*Tabanus atrohirtus* Ricardo, 1911
Type location: Sri Lanka
Distribution: Oriental region (India: Unknown; Sri Lanka; Sumatra)

*Tabanus attenuatus* Walker, 1848 = *Atylotus aurisquamous* Bigot, 1892
Type location: Assam, India
Distribution: Oriental region (India: Assam)

*Tabanus auriflamma* Walker, 1848*
Type location: Sylhet, Bangladesh
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Meghalaya, Nagaland; Bangladesh)

*Tabanus aurineatus* Schuurmans Stekhoven, 1926
Type location: Sumatra
Distribution: Oriental region (India: Nagaland; Malaysia, Sumatra, Thailand)

*Tabanus aurisegmentatus* Schuurmans Stekhoven, 1932
Type location: Gersoppa, N Kanara, SW India
Distribution: Oriental region (India: Karnataka)

*Tabanus auristriatus* Ricardo, 1911*
Type location: Kondo, Mysore, India
Distribution: Oriental region (India: Karnataka, Kerala, Tamil Nadu, Uttarakhand; Myanmar)

*Tabanus avittatus* Schuurmans Stekhoven, 1926
Type location: Belgaum, Mumbai Presidency, India
Distribution: Oriental region (India: Karnataka, Mumbai)

*Tabanus biannularis* Philip, 1960* = *Tabanus bicinctus* Ricardo, 1911
Type location: Kadras jungle, N Kanara, SW India
Distribution: Oriental region (India: Karnataka, Kerala, Uttarakhand; Formosa; Malaysia; Vietnam)

*Tabanus birmanicus* (Bigot, 1892)*
Type location: Myanmar
Distribution: Oriental region (India: Meghalaya, Mizoram, Sikkim; Formosa; Malaysia; Myanmar; Thailand; Vietnam); Palearctic region (China)

*Tabanus bombayensis* Schuurmans Stekhoven, 1926
Type location: Basi, N Kanara, SW India
Distribution: Oriental region (India: Andaman island, Bihar, Jharkhand, Karnataka, Kerala, Orissa, Punjab, UP, Uttarakhand, West Bengal; Cambodia; Java; Laos; Myanmar; Sumatra; Thailand; Vietnam)

*Tabanus brunnipennis* Ricardo, 1911*
Type location: Mahabaleswar, Maharashtra, India
Distribution: Oriental region (India: Assam, Maharashtra)

*Tabanus caeruleascens* Macquart, 1838
Type location: Java
Distribution: Oriental region (India: Tamil Nadu; Java)
**Tabanus conicus** (Bigot, 1892)  
Type location: India  
Distribution: Oriental region (India: West Bengal; Cambodia; Java; Malaysia); Palearctic region (Taiwan)  

**Tabanus consanguineus** Macquart, 1838  
Type location: Malabar coast, India  
Distribution: Oriental region (India: Kerala)  

**Tabanus decorates** Szilady, 1926  
Type location: Ostindien  
Distribution: Oriental region (India: Central)  

**Tabanus demellonis** Senior-White, 1924  
Type location: Combarjua  
Distribution: Oriental region (India: Unknown)  

**Tabanus destructus** Szilady, 1926  
Type location: S Asia  
Distribution: Oriental region (India: Tamil Nadu)  

**Tabanus discrepans** Ricardo, 1911  
Type location: Sri Lanka  
Distribution: Oriental region (India: Kerala; Sri Lanka)  

**Tabanus diversifrons** Ricardo, 1911 = *Atylotus flaviventer* Bigot, 1892 = *Tabanus ochrogaster* Philip, 1960  
Type location: Shillong, Meghalaya, India  
Distribution: Oriental region (India: Meghalaya, Tamil Nadu, Uttarakhand, West Bengal; Bangladesh; Myanmar; N Vietnam)  

**Tabanus excelsus** Ricardo, 1913**  
Type location: Mashorba, Simla hills, HP, India  
Distribution: Oriental region (India: HP, Uttarakhand)  

**Tabanus explicatus** Walker, 1854*  
Type location: Mashorba, Sikkim, India  
Distribution: Oriental region (India: Karnata, Meghalaya, Sikkim)  

**Tabanus flavimedius** Schuurmans Stekhoven, 1926  
Type location: Ruhdpur camp, Punjab, India  
Distribution: Oriental region (India: Punjab; Nepal)  

**Tabanus flavipus** Schuurmans Stekhoven, 1926  
Type location: India  
Distribution: Oriental region (India: Unknown)  

**Tabanus flaviscutellus** Philip, 1962  
Type location: Sumatra  
Distribution: Oriental region (India: Sikkim; Sumatra; Vietnam)  

**Tabanus frondosus** Szilady, 1926 = *Tabanus latifrons* Schuurmans Stekhoven, 1926 = *Tabanus paralatifrons* Schuurmans Stekhoven, 1928  
Type location: Nilgiri, India  
Distribution: Oriental region (India: Tamil Nadu)  

**Tabanus fuscomaculatus** Ricardo, 1911**  
Type location: Myanmar  
Distribution: Oriental region (India: Arunachal Pradesh, Sikkim; Myanmar; Pakistan; Palearctic region (China)  

**Tabanus gertrudae** Philip, 1960 = *Tabanus flavicinctus* Ricardo, 1911  
Type location: Shillong, Meghalaya, India  
Distribution: Oriental region (India: Meghalaya, Tamil Nadu, Uttarakhand)  

**Tabanus griseifacies** Schuurmans Stekhoven, 1926  
Type location: Sibsagar, Assam, India  
Distribution: Oriental region (India: Assam, Bihar, West Bengal; Myanmar; Sri Lanka)
Tabanus hybridus Wiedemann, 1828*
Type location: Macao
Distribution: Oriental region (India: Unknown; Bangladesh; Borneo; Hainan island; Malaysia; Myanmar; Sumatra; Thailand); Palearctic region (China)

Type location: Mahabaleswar, Maharashtra, India
Distribution: Oriental region (India: Maharashtra, Sikkim)

Type location: Mahabaleswar, Maharashtra, India
Distribution: Oriental region (India: Maharashtra, Sikkim)

Type location: Chennai, India
Distribution: Oriental region (India: Tamil Nadu)

Type location: Sri Lanka
Distribution: Oriental region (India: Unknown; Sri Lanka)

Type location: Sylhet, Bangladesh
Distribution: Oriental region (India: Meghalaya; Bangladesh)

Type location: India
Distribution: Oriental region (India: Assam)

Type location: Hongkong, China
Distribution: Oriental region (India: Arunachal Pradesh, Maharashtra, Sikkim, Uttarakhand; Pakistan; Sri Lanka)

Type location: Khasi hills, Assam, India
Distribution: Oriental region (India: Meghalaya, UP; Malaysia; Sumatra)

Type location: Beluchistan (Iran)
Distribution: Ethiopian region (Iran; Iraq; Israel; Kirghizia; Tadzhikistan; Turkey; Turkmenia; Uzbekistan); Oriental region; (India: Jammu and Kashmir, UP; Afganistan; Pakistan)

Type location: Punjab, India
Distribution: Oriental region (India: Assam)

Type location: Indes.
Distribution: Oriental region (India: Karnataka, Meghalaya, West Bengal; Laos; Myanmar; Thailand); Palearctic region (China)

Tabanus leucohirtus Ricardo, 1909

Type location: Jordan valley, Palestine
Distribution: Ethiopian region (Algeria; Iran; Iraq; N Africa; S Europe); Oriental region (India: Jammu and Kashmir, HP; Pakistan); Palearctic region (China)
Type location: Kanara, Karnataka, India.
Distribution: Oriental region (India: Karnataka)

*Tabanus leucopogon* (Bigot, 1892)
Type location: Sikkim, India.
Distribution: Oriental region (India: Sikkim)

*Tabanus limitatus* Stone, 1975
Type location: probably India.
Distribution: Oriental region (India: Unknown)

*Tabanus macer* (Bigot, 1892) = *Tabanus bicallosus* Ricardo, 1909 = *Tabanus trichinopolis* Ricardo, 1914
Type location: India.
Distribution: Oriental region (India: Bihar, Tamil Nadu, West Bengal)

*Tabanus manipurensis* Ricardo, 1913**
Type location: Urkul, Manipur, India.
Distribution: Oriental region (India: Manipur); Palearctic region (China)

*Tabanus melanognathus* (Bigot, 1890)*
Type location: Laos.
Distribution: Oriental region (India: Arunachal Pradesh; Laos; Thailand)

*Tabanus monotaeniatus* (Bigot, 1892)*
Type location: Indes.
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Meghalaya, Sikkim, West Bengal; Java; Myanmar); Palearctic region (China)

*Tabanus namdaphaicus* Datta and Chakraborti, 1985*
Type location: Namdapha, Arunachal Pradesh, India.

*Tabanus (Tabanus) nemocallosus* Ricardo, 1909
Type location: Pusa, Bihar, India.
Distribution: Oriental region (India: Bihar, Uttarakhnd; Nepal; Pakistan)

*Tabanus nephodes* (Bigot, 1892)* = *Tabanus salvaza* Surcouf, 1922
Type location: Naga hills, Nagaland, India.
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Nagaland)

*Tabanus nicobarensis* Schiner, 1868
Type location: Nankauri and Sembelong, Nicobar island, India.
Distribution: Oriental region (India: Nicobar island)

*Tabanus noctuinus* Schuurmans Stekhoven, 1926
Type location: Near Kodaikanal, Tamil Nadu, India.
Distribution: Oriental region (India: Tamil Nadu)

*Tabanus nonoptatus* Ricardo, 1911
Type location: N Bengal, India.
Distribution: Oriental region (India: Bihar)

*Tabanus obconicus* Walker, 1850*
Type location: Central India.
Distribution: Oriental region (India: Maharashtra; Bangladesh)

*Tabanus ochroceras* Schuurmans Stekhoven, 1932
Type location: Kodaikanal, S India.
Distribution: Oriental region (India: Tamil Nadu)

*Tabanus oknos* Surcouf, 1922
Type location: Tonkin.
Distribution: Oriental region (India: Arunachal Pradesh; Cambodia; Laos; Thailand; Vietnam)

Tabanus optatus Walker, 1856 = Tabanus albescutatus Rondani, 1875 = Tabanus equestris Wulp, 1885
Type location: Borneo.
Distribution: Oriental region (India: Bihar, Orissa; Bangladesh; Borneo; Java; Malaysia; New Guinea; Sumatra)

Tabanus Orientalis Wiedemann, 1824*
Type location: Indian orient.
Distribution: Oriental region (India: Unknown)

Tabanus orientis Walker, 1848* = Atylotus melanopygatus Bigot, 1892 = Atylotus pagodinus Bigot, 1892 = Tabanus consocius Walker, 1850 = Tabanus fulvimedius Walker, 1848 = Tabanus perlinea Walker, 1850
Type location: Nepal.
Distribution: Oriental region (India: Assam, HP, Manipur, Nagaland, Sikkim, Uttarakhand, West Bengal; Bhutan; Nepal; Pakistan); Palearctic region (China)

Tabanus oxyceratus (Bigot, 1892)*
Type location: India.
Distribution: Oriental region (India: Uttarakhund; Myanmar; Nepal)

Tabanus pallidiventer Schuermans Stekhoven, 1926
Type location: Bengal, India.
Distribution: Oriental region (India: West Bengal; Bangladesh)

Tabanus parafuscomaculatus Schuermans Stekhoven, 1932
Type location: Sikkim, India.
Distribution: Oriental region (India: Sikkim)

Tabanus parahybridus Schuermans Stekhoven, 1932
Type location: Chennai, India.
Distribution: Oriental region (India: Tamil Nadu)

Tabanus praematurus Austen, 1922
Type location: Chiangmai, Thailand.
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Sikkim; Thailand)

Tabanus priscoïdes Schuermans Stekhoven, 1926
Type location: India.
Distribution: Oriental region (India: Unknown; Java)

Tabanus provincialis Ricardo, 1913**
Type location: Travancore and Kurseong, India.
Distribution: Oriental region (India: Kerala, West Bengal)

Tabanus pullomaculatus Philip, 1970*
Type location: Mangeng, Sikkim, India.
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Manipur, Sikkim); Palearctic region (China)

Tabanus rectilineatus Schuermans Stekhoven, 1926
Type location: Malabar, India.
Distribution: Oriental region (India: Kerala)

Tabanus rhinargus Philip, 1962
Type location: Vietnam.
Distribution: Oriental region (India: Manipur; Thailand; Vietnam)

Tabanus rubicundus Macquart, 1846* = Atylotus monilifer Bigot, 1892 = Tabanus intermus Walker, 1848
Type location: East India.
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Meghalaya, West Bengal; Bangladesh; Laos; Myanmar)
Tabanus rubidoides Szilady, 1926
Type location: Mumbai, India.
Distribution: Oriental region (India: Maharashtra)

Tabanus rubidus Wiedemann, 1821* = Atylotus lacrymans Bigot, 1892 = Tabanus albimedius Walker, 1850 = Tabanus lagenaeferus Macquart, 1838 = Tabanus priscus Walker, 1848 = Tabanus umbrosus Walker, 1850 = Tabanus vagus Walker, 1850
Type location: Bengalia.
Distribution: Oriental region (India: Arunachal Pradesh, Meghalaya, Orissa, Sikkim, West Bengal; Indonesia; Pakistan; Philippines); Palearctic region (China)

Tabanus rubiginosus Walker, 1850
Type location: East India.
Distribution: Oriental region (India: North East)

Tabanus sagittipalpis Szilady, 1926
Type location: East India.
Distribution: Oriental region (India: Arunachal Pradesh, Sikkim)

Tabanus scutellus Philip, 1970
Type location: Kameng, Arunachal Pradesh, India.
Distribution: Oriental region (India: Arunachal Pradesh, Sikkim)

Tabanus servillei Macquart, 1838 = Phytra nigriventris Enderlein, 1925 = Tabanus pyrausta Walker, 1850
Type location: Indes Orientales.
Distribution: Oriental region (India: Assam; Java)

Tabanus sexcinctus Ricardo, 1911
Type location: Lushai hills, Assam, India.
Distribution: Oriental region (India: Assam, Uttarkhand; Myanmar; Thailand); Palearctic region (China)

Tabanus shyamarupi Datta and Chakraborti, 1985
Type location: Namdapha, Arunachal Pradesh, India.
Distribution: Oriental region (India: Arunachal Pradesh)

Tabanus siamensis Ricardo, 1911
Type location: Siam
Distribution: Oriental region (India: Maharashtra; Cambodia; Laos; Thailand)

Tabanus speciosus Ricardo, 1911* = Tabanus chinensis Thunberg, 1827 = Tabanus dorsilinea Wiedemann, 1824 = Tabanus hilaris Walker, 1850
1787. Tabanus striatus Fabricius, Mantissa Insectorum, 2: 356.
Type location: China
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Bihar, Delhi, Gujrat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Punjab, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal; Bhutan; Cambodia; Laos; Pakistan; Sri Lanka; Thailand; Vietnam); Palearctic region (China)

Tabanus subcinerascens Ricardo, 1911
Type location: Myanmar
Distribution: Oriental region (India: Assam; Bangladesh; Java; Myanmar)

Tabanus subflavicornis Philip, 1970
Type location: Tong, Sikkim, India.
Distribution: Oriental region (India: Sikkim; Indonesia; Sumatra)

Tabanus subhirtus Ricardo, 1911 = Atylotus cinerascens Bigot, 1892
Type location: Java
Distribution: Oriental region (India: Maharashtra; Bangladesh; Java)

*Tabanus Sufis* Jaenicke, 1867 = *Tabanus alboventralis* Newstead, Dutton and Todd, 1907 = *Tabanus lacteipennis* Becker, 1913
Type location: Africa
Distribution: Ethiopian region (Abyssinia; Chad; Egypt; Gambia; Iran; Iraq; Israel; Nigeria; Saudi Arabia; Sudan); Oriental region (India: Jammu and Kashmir, Punjab, UP; Pakistan)

*Tabanus tenens* Walker, 1854
Type location: Kanara, Malabar coast, India
Distribution: Oriental region (India: Karnataka)

*Tabanus tenens* Walker, 1850* = *Tabanus manilensis* Schiner, 1868 = *Tabanus megalops* Walker, 1854 = *Tabanus partitus* Walker, 1857 = *Tabanus rufocallosus* Bigot, 1892 = *Tabanus strophicatus* Surcouf, 1923
Type location: East India
Distribution: Oriental region (India: Maharashtra, Orissa, Punjab, Tamil Nadu; Bali; Java; Myanmar; Sri Lanka)

*Tabanus tenuifrons* Datta and Chakraborti, 1985*
Type location: Namdapha, Arunachal Pradesh, India
Distribution: Oriental region (India: Arunachal Pradesh; Celebs; Indonesia; Java; Malaysia; Sumatra)

*Tabanus trinominatus* Senior-White, 1927 = *Atylotus angustus* Bigot, 1883 = *Tabanus angustus* Bigot, 1892 = *Tabanus palpalis* Ricardo, 1911
Type location: India
Distribution: Oriental region (India: Uttarakhand)

*Tabanus tripurensis* Datta, 1986*
Type location: Tripura, India

*Tabanus tuberculatus* Ricardo, 1911*
Type location: Assam, India
Distribution: Oriental region (India: Bihar, Karnataka; Bangladesh)

*Tabanus wallacei* Szilady, 1926
Type location: East India
Distribution: Oriental region (India: Assam)

*Tabanus xanthoimus* Philip, 1960
Type location: Ledo, Assam, India
Distribution: Oriental region (India: Assam)

Tribe Haematopotini (Chainey & Oldroyd, 1980)

**HAEMATOPOTA** Meigen, 1803 [71 Species]

*Haematopota adusta* Stone and Philip, 1974
Type location: Taliparamba, North Malabar, India
Distribution: Oriental region (India: Karnataka, Kerala)

*Haematopota albiglomerata* Stone and Philip, 1974
Type location: Bhagavati, Mysore, Karnataka, India
Distribution: Oriental region (India: Karnataka)

*Haematopota albofasciatipennis* Brunetti, 1912
Type location: Bhowali, Kumaon district, Uttarakhand, W Himalaya, India
Distribution: Oriental region (India: Uttarakhand, West Bengal; Nepal)

*Haematopota alyta* Stone and Philip, 1974
Type location: Mathantir Gah, Jammu and Kashmir, India
Distribution: Oriental region (India: Jammu and Kashmir; Myanmar)

*Haematopota alticola* (Philip, 1961)
Type location: Mathantir Gah, Jammu and Kashmir, India
Distribution: Oriental region (India: Jammu and Kashmir; Myanmar)
Type location: Cinchona, Coimbatore, Anaimalai hills, India
Distribution: Oriental region (India: Tamil Nadu)

*Haematopota amala* Stone and Philip, 1974
Type location: Pherjo, Manipur, Assam, India
Distribution: Oriental region (India: Manipur)

*Haematopota annandalei* Ricardo, 1911*
Type location: Government gardens, Shillong, Assam, India
Distribution: Oriental region (India: Arunachal Pradesh, Assam, Maharashtra, Meghalaya, Sikkim, West Bengal; Myanmar); Palearctic region (China)

*Haematopota assamensis* Ricardo, 1911*
Type location: Nongpoh, khasi hills, Assam, India
Distribution: Oriental region (India: Arunachal Pradesh, Meghalaya, West Bengal; Nepal; Thailand; Vietnam); Palearctic region (China)

*Haematopota barri* Stone and Philip, 1974
Type location: Hasimara, W. Bengal, India
Distribution: Oriental region (India: West Bengal)

*Haematopota biguttata* Stone and Philip, 1974
Type location: Sothupari, Tamil Nadu, India
Distribution: Oriental region (India: Tamil Nadu)

*Haematopota biharensis* Stone and Philip, 1974
Type location: Pusa near Patna, Bihar, India
Distribution: Oriental region (India: Assam, Bihar)

*Haematopota bilineata* Ricardo, 1911
Type location: Igatpuri, Mumbai, India
Distribution: Oriental region (India: Goa, Maharashtra)

*Haematopota biroi* Szilady, 1926
Type location: Mumbai, India
Distribution: Oriental region (India: Maharashtra, MP)

*Haematopota brevis* Ricardo, 1906* = *Haematopota ricardonis* Senior-White, 1925
Type location: Kantha, Sri Lanka
Distribution: Oriental region (India: Karnataka, Punjab, Tamil Nadu; Sri Lanka)

*Haematopota cana* Walker, 1848 = *Haematopota montium* Szilady, 1926 = *Haematopota niontium* Szilady, 1926
Type location: N Bengal, India
Distribution: Oriental region (India: Karnataka, Maharashtra, Tamil Nadu, West Bengal)

*Haematopota casca* Stone and Philip, 1974
Type location: Kameng, Arunachal Pradesh, India
Distribution: Oriental region (India: Arunachal Pradesh)

*Haematopota chvalai* Stone and Philip, 1974
Type location: N Coorg, Karnataka, India
Distribution: Oriental region (India: Karnakata, Tamil Nadu)

*Haematopota cilipes* Bigot, 1890
Type location: Laos
Distribution: Oriental region (India: Assam; Cambodia; Laos; Myanmar; Thailand); Palearctic region (China)

*Haematopota cingalensis* Ricardo, 1906*
Type location: 19th milestone, Kandy road, Sri Lanka
Distribution: Oriental region (India: Haryana; Sri Lanka)
Haematopota contracta Stone and Philip, 1974
Type location: Cinchona, Coimbatore, Anaimalai hills, India
Distribution: Oriental region (India: Tamil Nadu)

Haematopota cordigera Bigot, 1891
Type location: Bengal, India
Distribution: Oriental region (India: West Bengal; Thailand; Vietnam)

Haematopota crossi Stone and Philip, 1974
Type location: Sohawa, Jhelum district, Punjab, Pakistan
Distribution: Oriental region (India: Uttarakhand; Pakistan; Nepal)

Haematopota darjeelingensis Datta, 1981
Type location: Tiger hills, Darjeeling, WB, India
Distribution: Oriental region (India: West Bengal)

Haematopota demellonis Senior-White, 1922
Type location: Nova Goa, Portuguese India
Distribution: Oriental region (India: Goa; Thailand)

Haematopota dissimilis Ricardo, 1911
Type location: Baste, N Kanara, India
Distribution: Oriental region (India: Karnataka, Uttarakhand)

Haematopota echma Stone and Philip, 1974
Type location: Ootacamund, Nilgiris, India
Distribution: Oriental region (India: Karnataka, Tamil Nadu)

Haematopota equina Stone and Philip, 1974
Type location: Cherrapanji, Assam, India
Distribution: Oriental region (India: Meghalaya, West Bengal)

Haematopota fasciata Ricardo, 1911
Type location: Shillong, Assam, India
Distribution: Oriental region (India: Jammu and Kashmir, Meghalaya, West Bengal; Myanmar; Thailand)

Haematopota flavicornis Szilady, 1926
Type location: India
Distribution: Oriental region (India: Unknown)

Haematopota flavipuncta Stone and Philip, 1974
Type location: Tinsukia, Assam, India
Distribution: Oriental region (India: Assam, Manipur, West Bengal)

Haematopota hindostani Ricardo, 1917
Type location: Bababuddin hills, Mysore, Karnataka, India
Distribution: Oriental region (India: Karnataka, Tamil Nadu)

Haematopota immaculata Ricardo, 1911
Type location: Kanara, Mumbai, India
Distribution: Oriental region (India: Karnataka, Maharashtra)

Haematopota inconspicua Ricardo, 1911
Type location: Igatpuri, Mumbai, India
Distribution: Oriental region (India: Karnataka, Maharashtra)

Haematopota indiana Bigot, 1891
Type location: Margherita, Assam, India
Distribution: Oriental region (India: Assam, Manipur, Meghalaya)
Haematopota javana Wiedemann, 1821* = Haematopota asiatica Rondani, 1875
Type location: Java
Distribution: Oriental region (India: Assam, Bihar, HP, Meghalaya, Mizoram, MP, Kerala, Tamil Nadu, Uttarakhand, West Bengal; Bangladesh; Java; Laos; Malaysia; Myanmar; Pakistan; Sumatra; Thailand; Vietnam); Palearctic region (China)

Haematopota jellisoni (Philip, 1960)
Type location: Ledo Road, Assam-Burma border
Distribution: Oriental region (India: Assam; Myanmar)

Haematopota kashmirensis Stone and Philip, 1974
Type location: Gurez, Kisangung river, Kashmir, India
Distribution: Oriental region (India: Jammu and Kashmir)

Haematopota keralaensis Kapoor, Grewal and Sharma, 1991
Type location: Mukkali, Kerala, India
Distribution: Oriental region (India: Kerala)

Haematopota latipes Ricardo, 1906*
Type location: Khasi hills district, India
Distribution: Oriental region (India: HP, Meghalaya, Uttarakhand, West Bengal; Laos; Myanmar; Thailand); Palearctic region (China)

Haematopota latifascia Ricardo, 1911 = Haematopota bessoni Senior-White, 1922 = Haematopota beessoni Senior-White, 1922
Type location: Shillong, Assam, India
Distribution: Oriental region (India: HP, Meghalaya, Tamil Nadu; Laos; Myanmar; Thailand)

Haematopota limbata Bigot, 1891
Type location: Bengal, India
Distribution: Oriental region (India: Karnataka, Meghalaya, West Bengal; Bangladesh)

Haematopota litoralis Ricardo, 1913* = Haematopota rhizophorae Senior-White, 1921
Type location: Puri, Orissa, India
Distribution: Oriental region (India: Kerala, Orissa; Sri Lanka)

Haematopota longipennis Stone and Philip, 1974
Type location: Ammatti, S Coorg, India
Distribution: Oriental region (India: Karnataka, Kerala, Tamil Nadu)

Haematopota labarica Stone and Philip, 1974
Type location: Walayar forest, S Malabar, India
Distribution: Oriental region (India: Goa, Karnataka, Kerala, Tamil Nadu)

Haematopota marceli Stone and Philip, 1974
Type location: Anaimalai hills, 4000-5000 m, S India
Distribution: Oriental region (India: Kerala, Tamil Nadu)

Haematopota marginata Ricardo, 1911
Type location: Pusa, Bihar
Distribution: Oriental region (India: Assam, Bihar, Meghalaya, West Bengal; Bangladesh)

Haematopota matherani Szilady, 1926
Type location: Matheran near Mumbai, India
Distribution: Oriental region (India: Maharashtra)

Haematopota melloi Stone and Philip, 1974
Type location: Nova, Goa, India
Distribution: Oriental region (India: Goa)

Haematopota montana Ricardo, 1917
Haematopota philipi Chvala, 1969

Type location: Bababuddin hills, Mysore, Karnataka, India
Distribution: Oriental region (India: Karnataka, Manipur, Meghalaya, Tamil Nadu)

Haematopota mouchai Stone and Philip, 1974

Type location: Pusa, Bihar
Distribution: Oriental region (India: Assam, Bihar, Punjab, West Bengal; Bangladesh; Nepal)

Haematopota pattoni Stone and Philip, 1974

Type location: Kodaiakanal, S India
Distribution: Oriental region (India: Tamil Nadu)

Haematopota philipi Chvala, 1969

Type location: Nepal
Distribution: Oriental region (India: Manipur; Nepal); Palearctic region (China)

Haematopota pisinna Stone and Philip, 1974

Type location: Jabalpur, MP, India
Distribution: Oriental region (India: MP)

Haematopota punctifera Bigot, 1891

Type location: Java
Distribution: Oriental region (India: Assam, SW India; Java; Laos; Myanmar; Thailand)

Haematopota rohtakensis Kapoor, Grewal and Sharma, 1991

Type location: Rohtak, Haryana, India
Distribution: Oriental region (India: Haryana)

Haematopota roralis Fabricius, 1805

Type location: Tranquebar, Madras, India
Distribution: Oriental region (India: Chattisgarh, Tamil Nadu; Bangladesh; Indonesia; Malaysia; Sri Lanka)

Haematopota schmidi Stone and Philip, 1974

Type location: Mawlang, Khasi hills, Assam, India
Distribution: Oriental region (India: Meghalaya)

Haematopota sikkimensis Stone and Philip, 1974

Type location: Mangang, Sikkim, India
Distribution: Oriental region (India: Sikkim)

Haematopota singarensis Stone and Philip, 1974

Type location: Singara, Nilgiri hills, India
Distribution: Oriental region (India: Tamil Nadu)

Haematopota sparsa Stone and Philip, 1974

Type location: Tranquebar, Madras, India
Distribution: Oriental region (India: Tamil Nadu)
Type location: Bhairabkunda, Kameng, Arunachal Pradesh, India
Distribution: Oriental region (India: Arunachal Pradesh)

*Haematopota striata* Stone and Philip, 1974
Type location: Naduvatam, Nilgiri hills, India
Distribution: Oriental region (India: Tamil Nadu)

*Haematopota taunggyiensis* Stone and Philip, 1974
Type location: Victoria, Chin hills, Myanmar
Distribution: Oriental region (India: Maharashtra; Myanmar; Thailand)

*Haematopota tessellata* Ricardo, 1906*
Type location: Hot wells, Trincomalee, Sri Lanka
Distribution: Oriental region (India: Chattisgarh, West Bengal; Sri Lanka)

*Haematopota zophera* Stone and Philip, 1974
Type location: Mumbai
Distribution: Oriental region (India: Karnataka, Maharashtra)

**HIPPOCENTRODES** Philip, 1961 [2 Species]

*Hippecentrodes desmotes* Philip, 1961
Type location: Kanchrapara, West Bengal
Distribution: Oriental region (India: Rajasthan, West Bengal; Nepal)

*Hippecentrodes striatipennis* (Brunetti, 1912)
Type location: Mussorie Hills, Dehra Dun, India
Distribution: Oriental region (India: HP, UP, Uttarakhand)

Tribe Diachlorini (Lutz, 1909)

**CYDISTOMYIA** Taylor, 1919 [8 Species]

sg. *Cydistomyia* Taylor, 1919

*Cydistomyia aberrans* Philip, 1970
Type location: Nanga, 5000 ft., Sikkim, India
Distribution: Oriental region (India: Sikkim)

*Cydistomyia assamensis* Philip, 1970
Type location: Bhairabkunda, 700-1000 ft., Kameng, Arunachal Pradesh, India
Distribution: Oriental region (India: Arunachal Pradesh)

*Cydistomyia iindiana* Philip, 1970
Type location: Lingai, 4400 ft., Garhwal, Chennai, India
Distribution: Oriental region (India: Tamil Nadu)

*Cydistomyia mouchai* Philip, 1970
Type location: Bhainse dobhan, Nepal
Distribution: Oriental region (India: Arunachal Pradesh; Nepal)

*Cydistomyia nigropictus* Macquart, 1855
Type location: East India
Distribution: Australasian oceanian region (Australia, New Guinea); Oriental region (India: East India)

*Cydistomyia polyzona* (Szilady, 1926)
Type location: Oriental India.
Distribution: Oriental region (India: Unknown)

*Cydistomyia primitiva* Mackerras, 1962
Type location: Pulney hills, Kodaikanal, 2200 m., India
Distribution: Oriental region (India: Tamil Nadu)

*Cydistomyia secunda* Mackerras, 1962
Type location: Pulney hills, Kodaikanal, 2200 m., India
Distribution: Oriental region (India: Tamil Nadu)
Species not assigned to any group

**DIACHLORUS** Osten Sacken, 1876 [1 species]

*Diachlorus fulvescens* (Brunetti, 1912)**
Type location: Dha Kuri, Kumaon district, India
Distribution: Oriental region (India: Uttarakhand)

**GRESSITTIA** Philip and Mackerras, 1960 [2 species]

*Gressittia apicalis* Philip and Mackerras, 1960
Type location: Nilgiri hills, 300 ft., India
Distribution: Oriental region (India: Tamil Nadu)

*Gressittia nepalenensis* Philip and Mackerras, 1960
Type location: Arun valley, 3500 ft., E. Nepal
Distribution: Oriental region (India: Sikkim; Nepal)

**PHILIPOTA** Kapoor, 1991 [2 species]

*Philipota kanpurensis* Kapoor, Grewal and Sharma, 1991
Type location: Kanpur, Uttar Pradesh, India
Distribution: Oriental region (India: UP)

*Philipota ludhianaensis* Kapoor, Grewal and Sharma, 1991
Type location: Ludhiana, Punjab, India
Distribution: Oriental region (India: Punjab)

9.2 Excluded genus

*Lissimas* Enderlein, 1922 see Notes

9.3 Excluded species

*Chrysops terminalis* Walker, 1848 see Notes
*Atylotus nemocallosus* Ricardo, 1909 see Notes
*Tabanus sg. Tabanus assamensis* (Bigot, 1892) see Notes
*Tabanus sg. Tabanus crassus* Walker, 1850 see Notes
*Tabanus sg. Tabanus dorsilinea* Wiedemann, 1824 see Notes
*Tabanus sg. Tabanus flavicornis* ssp. *subflavicorinis* Philip, 1970 see Notes

*Tabanus sg. Tabanus fulvimediuss* Walker, 1848 see Notes
*Tabanus sg. Tabanus monilifer* (Bigot, 1892) see Notes
*Tabanus sg. Tabanus partitus* Walker, 1856 see Notes
*Tabanus sg. Tabanus subcallosus* Ricardo, 1911 see Notes
*Tabanus sg. Tabanus triceps* Thunberg, 1827 see Notes
*Lissimas acallus* (Szilady, 1926) see Notes

9.4 Included species

*Chrysops fixissimus* Walker, 1856 see Notes
*Chrysops flaviventris* Macquart, 1846 see Notes
*Tabanus nigrifuscies* (Bigot, 1892) see Notes
*Tabanus sg. Tabanus hybridus* Wiedemann, 1828 see Notes
*Tabanus sg. Tabanus macer* (Bigot, 1892) see Notes
*Tabanus sg. Tabanus priscoideis* Schuurmans Stekhoven, 1926 see Notes
*Haematopota chvalai* Stone and Philip, 1974 see Notes
*Haematopota tessellata* Ricardo, 1906 see Notes

9.5 Notes

Previous checklist of Tabanidae [40] recorded 244 species under 15 genera, 3 subfamilies and 7 tribes. The existing list has been updated and the present list of Indian Tabanidae states that there are 247 species and 1 subspecies under 14 genera, 3 subfamilies and 6 tribes are existing after excluding 12 species due to synonymy and adding 15 tabanid species including 8 new records from India. 12 species under 4 genera are excluded from the previous list mostly due to synonymization viz. *Chrysops terminalis* Walker, 1848 becomes junior synonym of *Chrysops dispar* (Fabricius, 1798); *Atylotus nemocallosus* Ricardo, 1909 changes to *Tabanus (Tabanus) nemocallosus* Ricardo, 1909; *Tabanus (Tabanus) assamensis* (Bigot, 1892) changes to *Tabanus rufivenrirs* Fabricius, 1805; *Tabanus (Tabanus) crassus* Walker, 1850 becomes junior synonym of *Tabanus rufivenrirs* Fabricius, 1805; *Tabanus (Tabanus) dorsilinea* Wiedemann, 1824 becomes junior synonym of *Tabanus (Tabanus) striatus* Fabricius, 1787; *Tabanus (Tabanus) flavicorinis* subflavicorinis Philip, 1970 changes to *Tabanus (Tabanus) subflavicorinis* Philip, 1970; *Tabanus (Tabanus) fulvimediuss* Walker, 1848 becomes junior synonym of *Tabanus (Tabanus) orientis* Walker, 1848; *Tabanus (Tabanus) monilifer* (Bigot, 1892) changes to *Tabanus (Tabanus) rubicundus* Macquart, 1846; *Tabanus (Tabanus) partitus* Walker, 1856 becomes junior synonym of *Tabanus (Tabanus) tenens* Walker, 1850; *Tabanus (Tabanus) subcallosus* Ricardo, 1911 changes to *Hybomitra subcallosa* (Ricardo, 1911); *Tabanus (Tabanus) triceps* Thunberg, 1827 becomes junior synonym of *Tabanus dorsiger* Wiedemann, 1821; *Lissimas acallus* (Szilady, 1926) changes to *Tabanus (Tabanus) acallus* Szilady, 1926.
Whereas 9 species under 3 genera i.e. *Chrysops fixissimus* Walker, 1856; *Chrysops flaviventris* Macquart, 1846; *Tabanus (Tabanus) abscondens* Walker, 1860; *Tabanus (Tabanus) hybridus* Wiedemann, 1828; *Tabanus (Tabanus) macer* (Bigot, 1892); *Tabanus nigrifascies* (Bigot, 1892); *Tabanus (Tabanus) priscoides* Schuurmans Stekhoven, 1926; *Haematopota chvalai* Stone and Philip, 1974; *Haematopota tessellata* Ricardo, 1906 are added to the previous list to form the present checklist of Tabanidae. Modifications also occur in genus level of Tabanidae of existing list.

Previously genus *Gressittia* Philip and Mackerras, 1960 was placed under subfamily Chrysopsinae and tribe Bouvieromyiini, but the present list cannot assign it to any group according to updated classification scheme of Morita [41], followed in Systema Dipterorum and Life desk Tabanidae. Previously the genus *Philipota* Kapoor, 1991 was placed under subfamily Tabanini and tribe Diachloriini, but the current list cannot assign it to any group according to the same followed in Systema Dipterorum [45]. Probable reasons might be some major dissimilarities or anomalies in characters present in those 2 genera *Gressittia* Philip and Mackerras, 1960 and *Philipota* Kapoor, 1991. Therefore, they are not assigned to any group to avoid further conflict.

9.6 Abbreviation
* = Symbol designates species those are present in National Zoological collection.
** = Symbol designates species, type specimen of those are present.
sg. = Subgenus.
BMNH = British Museum of Natural History, UK.
MNHN = Museum National dhistoire naturelle, France.
CUIC = Chulalongkorn University International Club, Thailand.
NPCD = National Pusa Collection Delhi, India.
PAU = Punjab Agricultural University, India.

![Number of publications on Indian Tabanidae](image_url)

**Fig 1:** Shows the various publications of different authors who worked on several aspects of Indian Tabanidae.
Fig 2: Shows author, year and timeline wise contribution to Indian Tabanidae.

Fig 3: Shows time line of idea in no. of species of Indian Tabanidae in different time periods (1758-2016) for about 258 years, and 247 species that are found till date in India.
Fig 4: Shows the share of percentage of genera of Tabanidae in India and World.

Fig 5: Shows the share of percentage of species of Tabanidae in India and World.
**Fig 6:** Shows the cumulative relative percentage abundance of genera of Tabanidae in the various sub families present in India.

**Fig 7:** Shows the cumulative relative percentage abundance of species of Tabanidae in the various sub families present in India.
**Fig 8:** Shows the composition of genera in various subfamilies of Indian Tabanidae.

**Fig 9:** Shows the composition of species in various subfamilies of Indian Tabanidae.
Table 1: Tabanidae as vector for Surra disease from India with their distribution pattern are noted in this table. Updated after Veer, 1999 [79].

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Species</th>
<th>Disease / Disease agent</th>
<th>Reference</th>
<th>Distribution range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tabanus (Tabanus) sucis</td>
<td>Equine infectious anaemia virus (EIAV)</td>
<td>vide Krinsky, 1976</td>
<td>Ethiopian region; Oriental region</td>
</tr>
<tr>
<td></td>
<td>Jaennicke, 1867</td>
<td>Anaplasma marginale</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surra, Trypanosoma evansi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Tabanus rufiventris</td>
<td>Surra, Trypanosoma evansi</td>
<td>Yutuc, 1949</td>
<td>Oriental region</td>
</tr>
<tr>
<td></td>
<td>Fabricius, 1805</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Tabanus (Tabanus) tenens</td>
<td>Surra, Trypanosoma evansi, Theilerensis, Trypanosoma theileri</td>
<td>Mitzmain, 1913b, 1916; Yutuc, 1949; Nieschulz and Ponto, 1927b; Yutuc, 1949; Nieschulz, 1929</td>
<td>Oriental region</td>
</tr>
<tr>
<td></td>
<td>Walker, 1850</td>
<td>Anthrax, Bacillus anthracis</td>
<td>Kraneveld, 1931</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Buffalo sickness, Pasteurella multocida</td>
<td>Nieschulz and Kraneveld, 1929</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Tabanus (Tabanus) optatus</td>
<td>Surra, Trypanosoma evansi</td>
<td>Nieschulz, 1928b</td>
<td>Oriental region</td>
</tr>
<tr>
<td></td>
<td>Walker, 1856</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Tabanus ceylonicus</td>
<td>Surra, Trypanosoma evansi</td>
<td>Yutuc, 1949</td>
<td>Australasian-oceanian region; Oriental region</td>
</tr>
<tr>
<td></td>
<td>Schiner, 1868</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Chrysops flaviventris</td>
<td>Surra, Trypanosoma evansi</td>
<td>Nieschulz and Ponto, 1927b</td>
<td>Oriental region</td>
</tr>
<tr>
<td></td>
<td>Macquart, 1846</td>
<td>Anthrax, Bacillus anthracis</td>
<td>Nieschulz, 1929</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Chrysops fasciatus</td>
<td>Surra, Trypanosoma evansi</td>
<td>Nieschulz, 1928b,</td>
<td>Oriental region</td>
</tr>
<tr>
<td></td>
<td>Wiedemann, 1821</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8.</td>
<td>Tabanus (Tabanus) nemocallosum</td>
<td>Surra, Trypanosoma evansi</td>
<td>Cross and Patel, 1922; Yutuc, 1949</td>
<td>Oriental region</td>
</tr>
<tr>
<td></td>
<td>Ricardo, 1909</td>
<td></td>
<td></td>
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<tr>
<td>9.</td>
<td>Tabanus (Tabanus) striatus</td>
<td>Surra, Trypanosoma evansi</td>
<td>Fletcher, 1916; Nieschulz, 1928; Yutuc, 1949; Lang, 2001</td>
<td>Oriental region; Palearctic region</td>
</tr>
<tr>
<td></td>
<td>Fabricius, 1787</td>
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<tr>
<td>10.</td>
<td>Tabanus (Tabanus) rubidas</td>
<td>Surra, Trypanosoma evansi</td>
<td>Fletcher, 1916; Cross, 1923; Yutuc, 1949; Basu, et. al., 1952; Lang, 2001 Kraneveld, 1931 Nieschulz, 1929 Nieschulz and Kraneveld, 1929</td>
<td>Oriental region; Palearctic region</td>
</tr>
<tr>
<td></td>
<td>Wiedemann, 1821</td>
<td>Theilerensis, Trypanosoma theileri</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anthrax, Bacillus anthracis</td>
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<tr>
<td></td>
<td></td>
<td>Blackleg, Clostridium chauvoei</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Buffalo sickness, Pasteurella multocida</td>
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</tr>
</tbody>
</table>
The family Tabanidae in India is currently represented by 247 species under 14 genera and 3 subfamily namely Pangoninae, Chrysopsinae and Tabaninae. Subfamily Pangoninae has only one genus namely Atylotus Wiedemann, recorded from India. It has 7 known Indian species. A total of 18 species under subfamily Chrysopsinae is known from India. Under this subfamily 2 tribes namely Chrysopsini and Rhinomyzini have been recorded from India. Tribe Chrysopsini has 3 genera namely Chrysops Meigen has 13 species known to India; Melissomorpha Ricardo has only one indigenous species and only 2 species under genus Silvius Meigen are known from India. Single genus namely Gastroxides Saunders having 2 species under tribe Rhinomyzini have been recorded from India. Tabaninae is the most specious and diverse subfamily, recorded 136 species under 3 genera namely Atylotus Osten Sacken; Hybomitra Enderlein and Tabanus Linnaeus in tribe Tabanini from India. Among them Tabanus Linnaeus genus is the most specious group having 121 species distributed across the country. This subfamily has another Indian tribe namely Haematopotini which is occupying second position in species richness, a total of 73 species known under 2 genera namely Haematopta Meigen; Hippocentrodes Philip. Among them genus Haematopta Meigen is most species rich having 71 species recorded from the country. Tabaninae has another tribe namely Diachlorini which is represented by 8 species under single genus Cydistomyia Taylor. A total of 5 species under 3 genera namely Diachlorus Osten Sacken; Gressittia Philip & Mackerras and Philopta Kapoor canot be placed under any taxa. It has been seen from the present list that maximum number and percentage of genera and species of Indian tabanid has belonged to subfamily Tabaninae (43%; 6 & 88%; 217 respectively) followed by Chrysopsinae (29%; 4 & 7%; 18 respectively), unassigned genera (21%; 3 & 2%; 5 respectively) and Pangoninae (7%; 1 & 3%; 7 respectively) (Fig. 6, 7, 8 & 9). Moreover a total scenario on distribution pattern of surra disease vectors from India need to be discussed later to get a complete picture of number of tabanid vectors available from the country since surra is the most prevalent and several outbreaks specially in wild lives and livestock have already been reported from India [80, 82].

Distribution pattern of several Surra disease vectors from India (Table 1), is discussed here as all other fundamental aspects of flies of Family Tabanidae has already been discussed earlier. Among 14 vector species of tabanids that are known to transmit trypanosomiasis, all of them are recorded from Oriental region [81]. Only 4 species among them viz. Tabanus (Tabanus) striatus Fabricius, 1787; Tabanus (Tabanus) rubidus Wiedemann, 1821; Haematopota assamensis Ricardo, 1911 and Atylotus agrestis Wiedemann, 1824 are also reported from Palearctic region besides their

| No | Species Name                      | Disease                          | Authors       | Percentage
|----|----------------------------------|----------------------------------|---------------|-------------
| 11 | *Haematopota assamensis* Ricardo | *Surra, Trypanosoma evansi*      | Lang, 2001    | Oriental;   |
|    |                                  |                                  |               | Palearctic  |
| 12 | *Atylotus virgo* (Wiedemann, 1824) | *Surra, Trypanosoma evansi*      | Singh, 1926   | Oriental     |
| 13 | *Atylotus agrestis* (Wiedemann, 1828) | *Surra or Trypanosomiasis*       | Singh, 1926   | Ethiopian    |
|    |                                  | *Trypanosoma evansi*             |               | region      |
|    |                                  | *Trypanosoma vivax*              | Desquesnes and Dia, 2003 | Oriental; |
|    |                                  | *Influenza virus*                |               | Palearctic  |
| 14 | *Chrysops dispar* (Fabricius, 1798) | *Surra, Trypanosoma evansi*      | Nieschulz and Ponto, 1927; Nieschulz and Kraneveld, 1929; Lang, 2001 | Oriental; |
|    |                                  | Buffalo sickness, *Pasteurella*  |               | Palearctic  |
|    |                                  | *multocida*                      |               | region      |

10. Discussion
Through ages importance of this vector fly has increased especially in research arena as evident from growing number of publications in every 50 years time interval started as early as > 1800 up to the recent time (Fig. 1). From the literatures surveyed, it is evident that many authors contributed in addition of tabanid fauna in India and Ricardo, C.B. Philip, Allan Stone, J.M.F. Bigot and Schuurmans Stekhoven were some of towards in this context (Fig. 2). But nevertheless, taxonomy especially when focusing on discovery of tabanid species, a notable scenario has been arised with no species has been described newly from the country in twenty first century till date (Fig. 3). Indian tabanid genera and species have occupied very smaller percentage in comparison to their worldwide distribution (Fig. 4 & 5). Thereby it implies that taxonomic research on this important vector fauna in present time is really lacking and many more tabanid species may still await in our door steps to be discovered.
distribution in Oriental region and only 2 species among them i.e. *Tabanus (Tabanus) Sufis* Jaennickel, 1867 and *Atylotus agrestis* Wiedemann, 1828 exhibit wide distribution pattern and are reported to occur from Ethiopian region. *Tabanus ceylonicus* Schiner, 1868 is the only vector species known to belong from Australasian-oceanian region in recent literature. Distribution range of 7 Surra disease vector species are restricted to Oriental region. Among them *Tabanus* (*Tabanus*) *optatus* Walker, 1856 is endemic to India.

The present list has immense importance from the viewpoint of taxonomy as well as management of Surra disease. India remains the hot spots of biodiversity and variable climatic zonation and therefore such a study finds importance in understanding the diversity and occurrence of Tabanidae. Present list of vector species of Tabanidae for Surra disease so far may be exploited in design control plan and management strategies for disease intervention. Current list of Tabanidae has incorporated changes in scientific name of 12 species and addition of 8 species to the previous list [40]. Previous study of Veer [81] reported 154 species as endemic to the India but current study found that among 247 species that are found from India, 128 species are endemic to the country. Because many of the endemic species described previously, has also been reported from other neighbouring countries of Indian sub-region in recent literatures. It is remarkable to note that only one vector species of Tabanidae for Trypanosomiasis exhibit endemism. There lies the importance to study on these potential vector tabanid species in future to protect domestic and wild livestock not only in India, but in other disease prone areas across several countries of Oriental region.

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