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NEW SPECIFIC SYNONYMY IN NEOTROPICAL *SIMULIUM* S.L. (DIPTERA: SIMULIIDAE)

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In an attempt to clarify the taxonomy of Neotropical Simuliidae prior to the production of keys to species, various nomenclatural problems are resolved. Information is given on the status of types, their depositories, the condition of type-material where relevant, and on already established synonyms. Fifteen new synonyms are established and six lectotypes designated based on an examination of type-material and long series of reared specimens from many localities to take account of intraspecific variation.

The discovery of new foci of onchocerciasis in Brazil, Ecuador and Venezuela in the last two decades, together with the recently proven rôle of blackflies in the transmission of mansonelliasis in South America, has stimulated interest in Neotropical Simuliidae. The resultant proliferation of descriptions of species, especially from the lowland tropical forests of the Amazon and Orinoco basins, has in many cases stemmed from the widely-held view that these hitherto unprospected regions of South America must contain a plethora of new species awaiting discovery. Our contention is, however, that these regions largely contain the same species as adjacent regions offering similar habitats for which the fauna is already known. In addition, recognition of these "new species" is often based on comparisons with named specimens in small national or even institutional collections or solely on descriptions in the literature, rather than on comparisons with long series of specimens in the larger regional collections of international centres. This is largely due to the lack of a recognised international centre for Simuliidae in the Neotropical region (World Health Organization, 1979). However, collaborative work involving such major international centre as the Biosystematics Research Institute, Canada, the Bristish Museum (Natural History), United Kingdom, and the National Museum of Natural History, U.S.A., where there are substantial holdings of species from all zoogeographical regions, has now started in an attempt to clarify the currently confused taxonomy of Neotropical Simuliidae.

Another factor that will undoubtedly influence future taxonomic work in this region is the discovery of species complexes in Simuliidae, particularly of the Afrotropical and Holarctic regions. It is highly probable that similar species complexes occur in the Neotropical region but their supposed occurrence can only be investigated once the Neotropical simuliids have been well defined morphotaxonomically. One of the objectives of the present work is to provide a morphotaxonomic framework that will be the basis for future cytological studies, especially in species groups that contain vectors of human filariae. In this paper we contribute towards a simplification of the taxonomy of Neotropical Simuliidae by clarifying the nomenclature of several species based on an examination of type-material and long series of reared specimens essential for an understanding of intraspecific variation, previously overlooked by many workers in this region. Unfortunately, the primary types of species held in Venezuela could not be sent for examination. However Mr. J. Ramírez-Pérez kindly made available for study paratypes of some of these species. The species order in this paper is alphabetical.

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The following abbreviations are used for depositories:

BMNH – British Museum (Natural History), London, United Kingdom.
DER – Division de Endemias Rurales, Ministerio de Sanidad y Asistencia Social, Maracay, Venezuela.
IND – Instituto Nacional de Dermatología, Villa de Cura, Venezuela.
INPA – Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil.
IOC – Instituto Oswaldo Cruz, Rio de Janeiro, Brazil.
IP – Institut Pasteur, Paris, France.
MLP – Museo de La Plata, La Plata, Argentina.
MNHN – Muséum National d'Histoire Naturelle, Paris, France.
USNM – National Museum of Natural History, Washington, D.C., U.S.A.

Simulium cauchense Floch & Abonnenc

Simulium cauchense Floch & Abonnenc, 1946c: 1. Lectotype ♂ and associated pupal pelt [present designation], FRENCH GUIANA: Patawa Creek, R. Kaw [as' Caux']. In IP. [Examined].

Simulium sextobecium Nunes de Mello, 1974: 15. Holotype ♀ and associated pupal pelt, BRAZIL: Roraima Territory, Acampamento da Boca da Mata, Igarapé Cunaen. In INPA [Holotype lost, pers. comm. V.Py-Daniel, 1982]. Syn.n.

Simulium rangeli Ramírez-Pérez, Rassi & Ramírez, 1977: 163. Holotype ♀ and associated pupal pelt, VENEZUELA: Amazonas State, Department of Atabapo, Parima Moutains. R. Niayopeu. In personal collection of Ramírez-Pérez. [Not examined]. Syn.n.

Simulium cauchense is a zoophilic species belonging to the *S. amazonicum* group as defined by Shelley, Pinger & Moraes (1982) and is closely related to *S. quadrifidum* Lutz. Floch & Abonnenc (1946c) described the male morphology and leg coloration [of limited value since the specimen had not ecloded] and the morphology of the female and pupa. As adults were removed from pupae no details of their general coloration were given.

Type-material consists of a male and its associated pupal pelt, as well as the abdomen of a female, mounted on slide 742, and a female and pupal pelt on slide 743. Both slides bear labels in Abonnenc's hand as well as "type" labels added later. We designate the male and pupal pelt on slide 742 as lectotype because, unlike the female on slide 743, which is immature and still partially enclosed in the pupa, it is in good condition. The form of the genital forks, paraprocts and cerci of the female abdomen on slide 742 and the supernumerary female abdomen on slide 743 are similar and hence the specimens are judged as conspecific. It is probable that other paralectotypes exist, possibly in the Pasteur Institute in French Guiana, since Floch & Abonnenc (1946c) state that they collected specimens from a river system other than the Patawa, which is the provenance of the material that we examined.

We compared type-material of *S. cauchense* with paratypes and reared topotypes of *S. sextobecium* Nunes de Mello (1974) and type-series and reared topotypes of *S. quadrifidum* and found them to be morphologically very similar. *S. quadrifidum* can be distinguished from *S. sextobecium* by the female scutal pattern but neither could be compared in coloration to *S. cauchense* as this character was lacking in the original description (Floch & Abonnenc, 1946c) and is undiscernible in the type-material. However, the pupal gill configuration of *S. sextobecium* and *S. cauchense* are the same, but differ from *S. quadrifidum* in that the secondary branch bifurcations are more distal, and the inner of these bifurcations is more distal than the outer in *S. cauchense* and *S. sextobecium* whereas in *S. quadrifidum* they are equidistant from the base of the gill. We therefore synonymise *S. sextobecium* with *S. cauchense*.

S. cauchense has been recorded from French Guiana and is found sympatrically with *S. quadrifidum* in western Roraima, Brazil as well as the savannahs of eastern Brazil and western Guiana.

Although types were not available for study, the descriptions of *S. rangeli* Ramírez-Pérez, Rassi & Ramírez (1977) by Ramírez-Pérez, Yarzábal & Peterson (1982) are sufficiently detailed for us to synonymise this name with *S. cauchense*. The type-locality of *S. rangeli* is in eastern Venezuela continuous with the Brazilian onchocerciasis zone where *S. cauchense* is known to occur. For a full description of the adults and pupa of *S. cauchense* see Ramírez-Pérez, Yarzábal & Peterson (1982, as *S. rangeli*).

Simulium distinctum Lutz

Simulium distinctum Lutz, 1910: 241. Syntypes ♀, BRAZIL: São Paulo State, Serra da Bocaina; Minas Gerais State, Juiz de Fora; Rio de Janeiro State, Caxambu de Cima near Petrópolis. In IOC. [Synonymised with *S. pertinax* Kollar by Lane & Porto (1939); revalidated by d'Andretta & d'Andretta (1950)] [Examined].

Simulium prumirimense Coscarón, 1981: 160 Holotype ♀ and associated pupal pelt, BRAZIL: São Paulo State, R. Prumirim. In MLP [Examined]. Syn.n.

Simulium distinctum, a zoophilic species from south-east Brazil, is often confused with *S. pertinax*. Lutz (1910) described *S. distinctum* from female syntypes collected in several localities. Since then only a superficial description of the female has been provided by d'Andretta (1954) who also lists some of the references to and misidentifications of this species. The only nomenclatural change affecting *S. distinctum* was its synonymy with *S. pertinax* by Lane & Porto (1939) which Smart (1944, 1945) and Vargas (1945) follow. d'Andretta & d'Andretta (1950) revalidate *S. distinctum* and d'Andretta (1954) and Vulcano (1967) follow this action.

Following a comparison (by M.M-H) of *S. distinctum* syntypes with female holotype and male allotype of *S. prumirimense* from which the figures were drawn for Coscarón's description (1981), we synonymise this species with *S. distinctum.*

A description of the adults, pupa and larva of *S. distinctum* is given by Coscarón (1981, as *S. prumirimense*).

Simulium goeldii Cerqueira & Nunes de Mello

Simulium goeldii Cerqueira & Nunes de Mello, 1967: 125. Holotype ♂ and associated pupal pelt, BRAZIL: Amazonas State, Manaus, Igarapé do Tarumã. In INPA. [Not located in type depository].

Simulium scorzai Ramírez-Pérez, 1980: 59. Holotype ♀ and associated pupal pelt, VENEZUELA: Amazonas State, Alto Ventuari, Cacuri. In IND. [Not examined]. Syn.n.

Simulium goeldii is a common distinctive, zoophilic species from northern Brazil whose adults, pupa and larva were first described by Cerqueira & Nunes de Mello (1967).

Ramírez-Pérez (1980) described what he believed to be a related species, *S. scorzai*, from Venezuela which he separated from *S. goeldii* on a single character, the configuration of the pupal gill filaments. We have examined reared topotypes of *S. goeldii* and a reared female paratype of *S. scorzai* and judge them to be conspecific.

For a full description of the adults, pupa and larva see Cerqueira & Nunes de Mello (1967) and for the adults and pupa see Ramírez-Pérez, Yarzábal & Peterson (1982, as *S. scorzai*).

Simulium limbatum Knab

Simulium limbatum Knab, 1915: 280. Holotype ♀, GUIANA: Rupununi river. In BMNH [Examined].

Simulium meruoca Nunes de Mello, Almeida & Dellome Filho, 1973: 59. Holotype ♀, BRAZIL: Roraima Territory, Igarapé das Garrafas. In INPA. [Not located in type depository]. Syn.n.

Simulium machadoi Ramírez-Pérez, 1971: 341. Holotype [sex unspecified presumed female since only a full description of this stage is given], VENEZUELA: Aragua, Choroni. In DER. [Junior primary homonym of *S. machadoi* Luna de Carvalho 1962] [Not Examined]. Syn.n.

Simulium machadoallisoni Vulcano, 1981: 276. Nomen nudum. [Unsubstantiated replacement name for *Simulium machadoi* Ramírez-Pérez, 1971].

Simulium limbatum was described by Knab (1915) from a series of females collected from human baits in Guiana (formerly British Guiana). Knab placed *S. limbatum*, which is one of the most common anthropophilic species in the savannahs of northern Brazil and western Guyana, in the same group as *S. amazonicum*. The pinned female holotype and a female paratype, both in good condition, are in the BMNH, and other paratypes are probably in the USNM collection.

We have examined the BMNH material and compared it with reared specimens collected in Brazil and Guiana, as well as paratypes and topotypes of *S. meruoca* Nunes de Mello, Almeida & Dellome Filho (1973). We conclude that *S. meruoca* is conspecific with *S. limbatum*.

A similar comparison was made with reared male and female paratypes of *S. machadoi* Ramírez-Pérez which we also synonymise with *S. limbatum*. *S. machadoi* Ramírez-Pérez is a junior primary homonym of *S. machadoi* Luna de Carvalho (1962) of the Afrotropical region. Vulcano (1981) published a new name, *S. machadoallisoni*, in a check list of Simuliidae from tropical South America, indicating that it applied to a Venezuelan species which she omitted to name. She confirmed this to be *S. machadoi* Ramírez-Pérez in a letter to Dr. R.W. Crosskey of the BMNH (Crosskey, pers. comm.). Under the International Code of Zoological Nomenclature, *S. machadoallisoni* has to be treated as a nomen nudum.

Simulium nigrimanum Macquart

Simulium nigrimanum Macquart, 1838: 88. Lectotype ♀ [present designation], BRAZIL: São Paulo State. In MNHN. [Publication date incorrectly cited as 1837 by Vargas (1945) and d'Andretta & d'Andretta (1945)]. [Examined].

Simulium pruinosum Lutz, 1910: 250. Lectotype ♀ [designated by Vulcano (1959)], BRAZIL: Minas Gerais State, Lassance, Rio das Velhas. In IOC. [Examined]. Syn.n.

Simulium nigrimanum is a zoophilic species described by Macquart (1938) from specimens collected from the north of São Paulo, Brazil [the collection site is referred to as "nord de la Capitainerie de Saint-Paul" and would probably be within present day city limits]. As usual with Macquart's descriptions, no reference is made to the number of original specimens but the sex "♂" is given. The short description, which only refers to body length and colour, and leg and wing colour, is as follows: "SIMULIUM NIGRIMANA, *Nob. Nigrum; femoribus fulvis.* Long 1 1/2 1. Pieds: cuisses fauves; jambes et tarses noirâtres, premier article des tarses intermédiaires et postérieurs blanc, à extrémité noire; deuxième noir, à base blanche. Ailes blanches. Du Brésil, au nord de la Capitainerie de Saint-Paul". Since the original description, only one attempt has been made at giving a more precise definition of this species, but this was later found to refer to a species

other than *S. nigrimanum*. Thus in 1909 Lutz redescribed *S. nigrimanum* based on his own specimens from Brazil and without reference to tvpe-material. However, in 1910 Lutz believed that his specimens were not true *S. nigrimanum* but a new species, *S. orbitale*, which he then described in the adult, larval and pupal stages. *Simulium nigrimanum* has been cited as a Brazilian species in all relevant catalogues (Kertész, 1902;Surcouf & Gonzalez-Rincones, 1911; Pinto, 1932; Vargas, 1945; and Vulcano, 1967). In 1939, Lane & Porto synonymised *S. orbitale* with *S. nigrimanum* without giving their reasons, and this was accepted by Vargas (1945) and Smart (1945). However, d'Andretta & d'Andretta (1945) revalidated *S. orbitale* after an examination of Lutz's type-material and regarded *S. nigrimanum* as a *species inquirenda* because of the difficulty in recognising it from its original description.

Two female specimens of *S. nigrimanum* collected at São Paulo, Brazil, and identified by Macquart, have been located in the MNHN. One bears a label in Macquart's handwriting which reads *"Simulium nigrimana"* and a label *"S. nigrimanum* Macquart" in what is thought to be Séguy's hand. From the labels there is little doubt that these specimens, which are conspecific, are syntypes, and the reference to males in Macquart's description (1838) is probably a typographical error. Both are in poor condition being covered in a whitish deposit and mould. The better specimen, with Macquart's label, has been cleaned as far as possible in "Cellosolve" and a slide mount made of the head, abdomen, wing and foreleg. It is here designated as lectotype and has been labelled accordingly. Our examination of the lectotype of *S. nigrimanum* has shown that it is closely related to *S. orbitale, S. guianense* and *S. pintoi* and conspecific with *S. pruinosum* (Lutz, 1910) which falls as its synonym.

Some clarification in nomenclature needs to be made with reference to *S. nigrimanum* and *S. orbitale*. In 1909, Lutz erroneously referred to *S. nigrimanum sensu* Lutz as *S. albimanum* but as he later (Lutz, 1910) realised that his material was not true *S. nigrimanum* but a new species *S. orbitale*, the name *S. albimanum* became a synonym of *S. orbitale*. A complete description of the adults, pupa and larva of *S. nigrimanum* is given by Vulcano (1959, as *S. pruinosum*).

Simulium oyapockense Floch & Abonnenc

Simulium oyapockense Floch & Abonnenc, 1946c: 4. Lectotype ♀ and associated pupal pelt [present designation], FRENCH GUIANA: Maripa, R. Oyapock, near Cafésoca Falls. In IP [Examined].

Simulium pseudosanguineum Ramírez-Pérez & Peterson, 1981: 154. Holotype ♀ and associated pupal pelt, VENEZUELA: Bolivar State, Piar District, Canaima. In IND. [Not examined]. Syn.n.

Simulium sanchezi Ramírez-Pérez, Yarzábal & Peterson, 1982: 71. Holotype ♀ and associated pupal pelt, VENEZUELA: Amazonas State, Department of Rio Negro, San Carlos de Rio Negro, Raudal Mabajate. In IND. [Not examined]. Syn.n.

Simulium oyapockense was described by Floch & Abonnenc (1946c) in the adult and pupal stages. As adults were dissected from pupae, their coloration was not reliably known and hence the only subsequent reference made to *S. oyapockense* is in papers dealing with nomenclature and in catalogues.

Type-material consists of two specimens with syntype status: a male and associated pupal pelt mounted on slide 731 and a female and pupal pelt on slide 732. Both specimens bear the label "type". The latter specimen has been incorrectly quoted as 729 in the original description (Floch & Abonnenc, 1946c).There is no doubt that the error lies in the publication and not in the numbering of the adults since: specimen 732 bears a type label and agrees entirely with the data given in the paper for this type, albeit under the number 729; it is consecutive in number sequence to the other syntype of this

species, a practice observed by the authors in all their descriptions of new species from French Guiana (Floch & Abonnenc, 1946 a,b,c); it is deposited in the Pasteur Institute, France, where Abonnenc sent the types on which his descriptions were based (Abonnenc, pers. comm. to AJS). The female and associated pupal pelt (732) is here designated as lectotype. Its condition is poor; the morphology of the undissected head is unrecognisable as it is still within the pupal integument; legs and wings are badly macerated but the claw is visible; the abdomen clearly shows the genital fork, paraproct and cercus, spermatheca and gonopophysis; the pupal thorax and gills are complete but the abdomen is missing. The other specimen (731) consists of a male dissected from its pupal pelt. Its condition is also poor: the head and thorax are badly macerated but the abdomen is intact and clearly shows the genitalia; the pupal thorax and gills are in good condition but the rest of the pupa is missing.

Before dealing with the new synonyms of *S. oyapockense*, we would like to clarify the status of a related species, which is now possible from our examination of Floch & Abonnenc's types. In 1982 Shelley, Pinger & Moraes dealt with *S. minusculum* Lutz and concluded from their examination of syntypes that either *S. minusculum* is a polymorphic species with regard to female scutal pattern, or that the syntype series contains two distinct species. They also suggested the possible synonymy of *S. roraimense* Nunes de Mello (1974) with *S. minusculum*. Since the pupal gill of *S. oyapockense* figured by Floch & Abonnenc (1946c) greatly resembled that of a species from Amazonia accepted as *S. minusculum* s. l by Shelley, Pinger & Moraes (1982) collections were made at the type-localities of *S. oyapockense* and of *S. minusculum*. The following conclusions have now been reached after an examination of these collections: the syntype series of *S. minusculum* contains two species, *S. minusculum* sensu stricto and *S. oyapockense*, which can be distinguished on both female scutal pattern and pupal gill configuration; *S. roraimense* is a valid species that can be distinguished from *S. minusculum* on male and female scutal patterns and on pupal gill configuration, and from *S. oyapockense*, its nearest relative, on male scutal pattern.

We synonymise *S. pseudosanguineum* Ramírez-Pérez & Peterson (1981) with *S. oyapockense* on the basis of the description given by these authors and on an examination of paratypes and other specimens identified by Ramírez-Pérez in the BMNH collection. *Simulium pseudosanguineum* was previously regarded as *Simulium* form C of the "*S. amazonicum* and *S. sanguineum* groups" [= *S. amazonicum* group of Shelley, Pinger & Moraes, 1982], by Tidwell et al. (1981). These authors also refer to form A which they distinguish from form C by the width of the vittae on the female scutum. We believe the two forms to be conspecific, the variation in vittal width being an intraspecific character and hence *Simulium* form A also falls within our interpretation of *S. oyapockense*. In their 1981 paper Ramírez-Pérez & Peterson describe differences between *S. pseudosanguineum* and the closely related *S. pseudoamazonicum* on which we would like to comment. Reference is to *S. pseudosanguineum* unless stated otherwise. The ventral ommatidia of male eyes are stated as being black, whereas they are dark red; the female cibarium is said to have a single row of teeth, whereas their figure shows at least two uneven rows, which agrees with BMNH material; female leg coloration is stated to differ from that of *S. pseudoamazonicum* – intensity of leg coloration is variable within species and this is often complicated by the use for descriptions of teneral specimens which do not show final coloration – this character is regarded by us as of limited value within the *S. amazonicum* group of species; the form of the cerci and paraprocts is used for distinguishing *S. pseudosanguineum* from related species – in this case specimen orientation is causing an artefact as the character is relatively uniform throughout the *S. amazonicum* group; *S. pseudosanguineum* is stated to have a reinforced collar to the cocoon [at least this is presumably what is meant by "con refuerzo en el borde anterior y lateral"], a character separating it from *S. pseudoamazonicum* – in BMNH specimens from Venezuela identified by Ramírez-Pérez *S. pseudoamazonicum* also shows this thick collar but it is less discernible as the cocoon is more transparent than that of *S. pseudosanguineum;* the ventral plate of male *S. pseudoamazonicum* and *S. pseudosanguineum* is described as "sin proceso mediano" [presumably meaning not pointed] – specimens of both these

taxa in the BMNH collection have been examined and seen to have a pointed ventral plate, which can be more easily seen when this structure is moved into different positions in glycerine – this character is consistent for all *S. amazonicum* group members. Lastly, in both the Spanish and English summaries *S. pseudoamazonicum* and *S. pseudosanguineum* are stated as having pupae with three gill filaments and not six as is the case.

We also regard *S. sanchezi* Ramírez-Pérez, Yarzábal & Peterson (1982) as a synonym of *S. oyapockense* based on the authors' description and key, on paratypes, and on specimens in the BMNH identified by Ramírez-Pérez. These authors distinguish *S. sanchezi* from *S. sanguineum* and other allied species of the *S. amazonicum* group on leg coloration, size of submedian silver cunae on the male scutum and the form of the granulations on the pupal integument. We are unable to confirm any of these differences as being of consistent value. As previously indicated, variation in leg coloration is a poor discriminant within the *S. amazonicum* group and the variations seen in male scutal pattern and pupal integument granulations between *S. sanchezi* and *S. oyapockense* are regarded as intraspecific.

Another species of the *S. amazonicum* group, *S. cuasisanguineum* described by Ramírez-Pérez, Yarzábal & Peterson (1982) is claimed by these authors to be most closely related to *S. roraimense* from which it may be distinguished by leg coloration in the female, scutal pattern in the male and a lack of granulations in the pupal integument (cephalothorax) of *S. cuasisanguineum*. Our comparison of reared *S. cuasisanguineum*, determined by Ramírez-Pérez, with topotypes of other *S. amazonicum* group species, produced the following conclusions. *Simulium cuasisanguineum* is closer to *S. oyapockense* than to either *S. roraimense* or *S. sanguineum*. It only differs from *S. oyapockense* in having no granulations on the frontoclypeus of the pupa and in having a reduced number of granulations on the thorax. The other differences cited by these authors were not observed. Although we have seen intraspecific variation in this character in all members of the *S. amazonicum* group, we have never encountered a complete lack of granulations on the frontoclypeus. Until such a time as the full extent of variation in this character is known, we maintain *S. cuasisanguineum* as a valid species.

For a description of the adults and pupa of *S. oyapockense* the reader is referred to Ramírez-Pérez, Yarzábal & Peterson (1982, as *S. pseudosanguineum* and *S. sanchezi*).

Simulium pertinax Kollar

Simulium pertinax Kollar, in Pohl, 1832: 117 and in Pohl and Kollar, 1832: 19. Holotype ♀, BRAZIL: São Paulo State, Ipanema. In Naturhistorisches Museum, Vienna, Austria. [Examined].

Simulium inexorabile Schrottky, 1909: 63. Syntypes ♀, ARGENTINA, BRAZIL, PARAGUAY: R. Paraná. [Type depository unknown; types probably destroyed.] [Synonymised with *Simulium pertinax* Kollar by Lutz (1922), revalidated by d'Andretta & d'Andretta (1950); synonymised with *Simulium pertinax* Kollar by Wygodzinsky (1953)].

Simulium (as *Chirostilbia) flavifemur* Enderlein, 1921a: 199. Lectotype ♀ [designated by Stone (1962)], BRAZIL: [no locality specified]. In Museum fur Naturkunde der Humboldt-Universität, Berlin, East Germany. [Synonymised with *Simulium pertinax* Kollar by Lane & Porto (1939); revalidated by d'Andretta & d'Andretta (1950); synonymised with *Simulium pertinax* Kollar by Coscarón (1981).] [Not examined].

Simulium (as *Trichodagmia) lutzianum* Enderlein (1934a): 291. Syntypes ♀, BRAZIL: [Rio de Janeiro and São Paulo regions]; PARAGUAY: San Bernardino and Hohenau. In IOC; Museum für Naturkunde der Humboldt-Universitat, Berlin, East Germany, Staatliches Museum für Tierkunde, Dresden, East Germany, [Synonymised with *Simulium pertinax* Kollar by Lane & Porto (1939).] [Not located in IOC].

Simulium septentrionale Cerqueira & Almeida, 1970: 1. Holotype ♀ and associated pupal pelt, BRAZIL: Territory of Rondônia, Porto Velho, Rio Machado, Igarapé Candelária. In INPA. [Junior primary homonym of *Simulium septentrionale* Enderlein, 1935 (Palearctic species).] [Not located in type depository].

Simulium cerqueirai Nunes de Mello & Almeida, 1974: 68 [Replacement name for *Simulium septentrionale* Cerqueira & Almeida, 1970.] [Synonymised with *Simulium pertinax* Kollar by Py-Daniel (1981).].

Simulium cerqueira Vulcano, 1981: 276. [Incorrect subsequent spelling of *S. cerqueirai* Nunes de Mello & Almeida.].

Simulium pertinax, the most common anthropophilic simuliid in south-east Brazil, was described briefly in Latin and more extensively in German by Kollar in Pohl's book (1832) "Reise im Innern von Brasilien [Journey in the Interior of Brazil]" in the section entitled "Die vorzüglich lästigen Insecten Brasiliens" [The highly annoying insects of Brazil]. This Section was reprinted with basically the same title, but with Pohl and Kollar as authors and with different pagination, in 1832. No details of type-locality or type-material are given, but reference is made to the biting habits of this species and to the appearance of the bite, and it is compared to the Golubatz fly (*S. columbaschense*) of Yugoslavia. The description obviously refers to the female as reference is made to its biting habits and fig. 14b of the plate clearly shows the sex.

We have examined a unique specimen from the Naturhistorisches Museum, Wien (Vienna Natural History Museum) that was collected on the Austrian expedition to Brazil during the second decade of the last century. The specimen is a female bearing the printed italic label: "*Natt: Brasil*" to which has been added in handwriting the collecting locality "Ypanema". The second printed label reads "Alte Sammlung" meaning "old collection". The specimen also has an Enderlein determination label dated 1935 reading "*Trichodagmia pertinax* (Kollar, 1832)". From these data it is concluded that the specimen is the holotype of *S. pertinax*. It was collected by Natterer and sent in his general insect collection to the then Imperial Cabinet of Natural History (now the Natural History Museum) in Vienna, which was housed in the Imperial Palace. Since the Natterer insect collection was large and important, it was housed separately to the main collection and hence escaped fire damage in the 1848 revolution. The collection locality Ypanema could either refer to the present-day Ipanema suburb of Rio de Janeiro or the locality near Sorocaba in São Paulo State. d'Andretta & d'Andretta (1950) believed the former, presumably since the description of *S. pertinax* by Kollar (in Pohl, 1832) occurs in an appendix to the chapter dealing with collections made by the main Austrian expedition in Rio de Janeiro. We, however, believe the collecting locality to be in São Paulo State since the preface (p.ix) to Pohl's work (1832) indicates that Natterer (the collector) and Sochor left Rio de Janeiro soon after arrival and went to Ypanema, São Paulo State, near the iron foundry, where they spent three years making extensive insect collections. This obviously refers to the iron foundry near Sorocaba and the appending of the section, "The highly annoying insects of Brazil" in which the description of *S. pertinax* is made, to the chapter concerning Rio de Janeiro was possibly for editorial reasons. The holotype was collected in the period 1819-1822 [for full details of Natterer's itinerary in Brazil see Papavero (1971)]. The specimen which is pinned, is in fair condition. A fore-leg, mid-leg and the abdomen have been removed and mounted on a slide by the senior author, and both slide mount and pinned specimen labelled as holotype. The modern concept of *S. pertinax* based on d'Andretta & d'Andretta's description (1950) conforms with this specimen.

The preceding list of synonyms is based mainly on d'Andretta & d'Andretta's comprehensive revision (1950) of *S. pertinax* in which full details of the reasons behind the synonymies as well as a list of misidentifications may be found. Where discord occurs between authors or where the nomenclatural problems are particularly confusing, a clarification of the relevant synonyms is given below.

Lutz (1909) suggested that *S. inexorabile* Schrottky may be a synonym of *S. pertinax* and later (Lutz, 1922), confirmed this synonymy. This action was followed by Lane & Porto (1939), Smart (1945) and Vargas (1945). d'Andretta & d'Andretta (1950) did not accept this synonymy but Wygodzinsky (1953) again synonymised *S. inexorabile* with *S. pertinax* based on his extensive collections made in the type-locality region of *S. inexorabile*. Vulcano (1967) lists *S. inexorabile* as a distinct species. We are supporting Wygodzinsky's action (1953) as it is unlikely that he would have missed *S. inexorabile* in his collections, if it were distinct from the well known *S. pertinax*; Schrottky's description (1909) of *S. inexorabile* is superficial and does not indicate any distinctive character of the species. No type-material has been found of Schrottky's three simuliid species from Paraguay and it is assumed that it was destroyed, together with the rest of his collection, "by soldiers during one of Paraguay's peasant riots around 1922" (Horn & Kahle, 1936).

The first description of *Simulium flavifemur* (with the generic name *Chirostilbia*) is attributed by some authors to Enderlein (1921c, published on 20/12/1921) in which the female is described as a new species. However, Enderlein had mentioned this species in two previous publications (1921a and 1921b published on 16/4/1921 and 3/6/1921 respectively). A key to simuliid genera is given in the 1921a paper in which Enderlein includes the genus *Chirostilbia* (regarded as a subgenus of *Simulium* by us) and names *Chirostilbia flavifemur* as type-species. As Enderlein's genus *Chirostilbia* was monotypic, sufficient detail of the "genus" is given for the name *Chirostilbia flavifemur* to be available under Article 12 of the International Code of Zoological Nomenclature by indication as defined in Article 16 (a) (v). d'Andretta & d'Andretta (1950) and Vulcano (1967) are the only authors not accepting Lane and Porto's synonymy (1939) of *S. flavifemur* with *S. pertinax*, the other two catalogues relevant to Neotropical simuliids (Smart, 1945; Vargas, 1945) being in accord. We support Coscarón's latest synonymy (1981) of *S. flavifemur* with *S. pertinax* based on his examination of the lectotype of the former species.

The synonymy of *Simulium lutzianum* Enderlein (as *Trichodagmia lutziana*) with *S. pertinax* by Lane & Porto (1939) without explanation is accepted by all authors and d'Andretta & d'Andretta (1950) support this action. We also agree with this synonymy and give the following clarification in its support. In 1909 Lutz gave a description of *S. venustum* Say based on specimens collected by him in Brazil (presumably in the regions around Rio de Janeiro and São Paulo) and identified by Coquillett. Lutz was obviously not in full acceptance of Coquillett's determination since he entitled the description "*S. venustum* Say (*S. pertinax* Kollar)" and stated that he had not fully decided on the name to use. In 1910 Lutz positively identified his material as *S. pertinax* Kollar after comparing it with specimens of the North American species *S. venustum* sent by Coquillett. His references, however, to the six-filamented pupae of *S. pertinax* (Lutz, 1909, 1910) are misidentifications which he later corrected (Lutz, 1922). From his examination of simuliids in the Staatliches Museum für Tierkunde, Dresden, and Museum für Naturkunde der Humboldt-Universität, Berlin (Natural History Museums of Dresden and Berlin), Enderlein (1934a) described the new species *Trichodagmia lutziana* based on females collected in Paraguay at San Bernardino by Fiebrig and at Hohenau, and regarded them as conspecific with the specimens from Brazil that Lutz (1909) had originally described as *S. venustum*. As Enderlein had examined specimens of true *S. venustum* he correctly noted that the Brazilian specimens were of another species, but was apparently not aware of Lutz's subsequent identification (1910) of this material as *S. pertinax*. Enderlein's new species was thus a synonym of *S. pertinax*. In the same year (1934b) Enderlein produced a paper on simuliids in the Vienna Natural History Museum. In it he referred to 19 females, collected by Fiebrig from San Bernardino, Paraguay, some of which were also deposited in the Natural History Museum, Berlin, as well as a single female from Ypanema, Brazil. He identified all those specimens as *T. lutziana*. However, in 1936 Enderlein regarded *S. lutzianum* (as *T. lutziana*) and *S. pertinax* (as *T. pertinax*) as distinct species and stated that all the Paraguayan material referred to in his 1934b paper as *T. lutziana* was now considered as *T. pertinax*. This therefore infers that Enderlein still considered the single specimen from Ypanema, Brazil, mentioned in his 1934b

paper, the Paraguayan material from Hohenau in his 1934a paper and Lutz's *"S. venustum"* specimens (Lutz, 1909) as *T. lutziana*. We have examined the specimen from Ypanema, Brazil, which bears an Enderlein determination label dated 1935 with the script *Trichodagmia pertinax* (Kollar, 1832), and regard it as the *S. pertinax* holotype (see above). It is apparent therefore that Enderlein was unable to distinguish between *"T. pertinax"* and *"T. lutziana"*. We are also unable to distinguish these two species from the characters cited by Enderlein (Enderlein, 1936) and accept that all his references to *Trichodagmia lutziana* and *T. pertinax* (Enderlein 1934a,b; 1936) refer to *S. pertinax*. This synonymy also avoids the necessity for proposing a new name for *T. lutziana* Enderlein which became preoccupied by *S. lutzianum* Pinto (1932) after the genus *Trichodagmia* was regarded by Edwards as a synonym of *Simulium* (Smart, 1944). Later, Stone (1963) proposed a classification of the Simuliidae involving subgenera which is accepted by most workers today. In this, *Trichodagmia* is treated as a synonym of the subgenus *Chirostilbia* within the genus *Simulium*.

Confusion has also arisen over the reference by Lutz (1909) to *S. venustum* variety *infuscatum* and later (Lutz, 1910) to a different species *S. infuscatum* Lutz which he synonymised with *S. auristriatum* Lutz (Lutz, 1917). We follow d'Andretta & d'Andretta (1949) and Vulcano (1967) in accepting this synonymy and in regarding *S. venustum* var. *infuscatum* as a varietas inquirenda Pinto (1932) and Vargas (1945) incorrectly list this variety as a synonym of *S. infuscatum* Lutz; *S. infuscatum* is regarded by Pinto (1932) as distinct from *S. auristriatum* but as the latter's synonym by Lane & Porto (1939) followed by Smart (1945) and Vargas (1945). *S. venustum* var. *infuscatum* could not be located in IOC, its original depository, and is presumed lost.

S. distinctum Lutz was also synonymised by Lane & Porto (1939) with *S. pertinax*, an action followed by both Smart (1945) and Vargas (1945). d'Andretta & d'Andretta (1950) however, revalidated *S. distinctum*. We agree with the latter authors based on our comparison of reared material of both species from Brazil with the holotype of *S. pertinax*. The two species may be most readily distinguished in the pupa; *S. pertinax* has an eight-filamented gill whereas that of *S. distinctum* bears ten filaments..

A full description of the adults, pupa and larva of *S. pertinax*, is given by d'Andretta & d'Andretta (1950).

Simulium quadrifidum Lutz

Simulium quadrifidum Lutz, 1917: 66. Lectotype pupa [here designated], BRAZIL: Rondônia Territory, Madeira-Mamoré region. In IOC [Synonymised with *Simulium amazonicum* Goeldi by Cerqueira & Nunes de Mello (1964); revalidated by Shelley, Pinger & Moraes (1982).] [Examined].

[*Simulium amazonicum* Goeldi sensu Cerqueira & Nunes de Mello, 1964. Male, pupa and larva. Misidentification].

Simulium rassii Ramírez-Pérez, 1980: 60. Holotype ♀ and associated pupal pelt, VENEZUELA: Amazonas State, Alto Ventuari, Cacuri. In IND. [Not examined]. Syn.n.

Simulium torrealbai Ramírez-Pérez, 1980: 64. Holotype ♀ and associated pupal pelt, VENEZUELA: Amazonas State, Department of Atabapo, Parima Mountains. In IND. [Not examined]. Syn.n.

Simulium quadrifidum is a zoophilic member of the *S. amazonicum* group, closely related to *S. cauchense* Floch & Abonnenc; it was described from the pupa by Lutz in 1917. The confused nomenclatural background to *S. quadrifidum* is discussed by Shelley, Pinger & Moraes (1982). *S. quadrifidum* was collected by Oswaldo Cruz at some point along the Madeira-Mamoré railroad in Rondônia, Brazil.

Type-material consists of five syntypes on four slides numbered 12.307 to 12.310 and also with the respective number sequence 321 to 324. The former numbers are those used by the Oswaldo Cruz Institute for the main insect collection and the latter were presumably given by Lutz. The pupa on slide 12.308 (322) is here designated as lectotype: it is in good condition, showing clearly the gill filaments, as well as the thorax and abdomen which are still within the cocoon. Slides 12.307 (321) and 12.309 (323) contain two pupae and one pupa respectively and slide 12.310 (324) contains a dissected male as well as a pupal abdomen from which it had possibly emerged. We have collected extensively in the Madeira-Mamoré region and base the following synonymies on this material which we have judged to be conspecific with the type-series.

Simulium quadrifidum can only be distinguished from *S. cauchense* by the female scutal pattern and pupal gill configuration. The two species are found sympatrically in the forested onchocerciasis zone of Brazil and in the adjacent area of Venezuela (recorded as *S. rassii* and *S. torrealbai* for *S. quadrifidum* – see Ramírez-Pérez, 1980 and as *S. rangeli* for *S. cauchense* – see Ramírez-Pérez, Rassi & Ramírez, 1977). We regard *S. rassii* and *S. torrealbai* as synonyms of *S. quadrifidum* since we consider the differences shown by Ramírez-Pérez (1980) in the female scutal pattern and pupal gill to be intraspecific and not interspecific.

A description of the adults and pupa of *S. quadrifidum* is given by Ramírez-Pérez, Yarzábal & Peterson (1982, as *S. quadrifidum*, *S. rassii* and *S. torrealbai*) and the male, pupa and larva by Cerqueira & Nunes de Mello (1964, as *S. amazonicum*).

Simulium rorotaense Floch & Abonnenc

Simulium rorotaense Floch & Abonnenc, 1946b: 4. Lectotype ♀ and associated pupal pelt [present designation], FRENCH GUIANA: Rorota Plateau. In IP. [Examined].

Simulium maroniense Floch & Abonnenc, 1946b: 9. Lectotype ♀, [present designation], FRENCH GUIANA: Sinnamary, Coeur Maroni Creek. In IP. [Examined]. Syn.n.

Simulium marionense Ortiz, 1957: 166. [Incorrect subsequent spelling of *S. maroniense* Floch & Abonnenc.].

Simulium wuayaraka Ortiz, 1957: 163. Holotype ♀ [incorrectly cited as allotype], VENEZUELA: Bolivar State, Auyantepuy, R. Guayaraca. In School of Science, Central University of Venezuela, Venezuela. [Not examined]. Syn.n.

Simulium wuyaraka Vulcano, 1967: 44. [Incorrect subsequent spelling of *S. wuayaraka* Ortiz].

Simulium wuayaraca Ramírez-Pérez, Yarzábal & Peterson, 1982: 96. [Incorrect subsequent spelling of *S. wuayaraka* Ortiz].

Simulium fulvinotum Cerqueira & Nunes de Mello in Cerqueira, 1967: 136. Lectotype ♀ and associated pupal pelt [incorrectly cited as holotype by Cerqueira & Nunes de Mello, 1968], BRAZIL: Manaus, Cachoeira Alta, Igarapé do Tarumã. In INPA. [Not located in type-depository]. Synonymised with *Simulium rorotaense* by Py-Daniel (1982).

Simulium ignacioi Ramírez-Pérez & Vulcano, 1973: 387. Syntypes ♀, ♂ and eight pupae, VENEZUELA: Bolivar State, Cabanayen (Gran Sabana). In IND and in private collection of M.A. Vulcano, São Paulo, Brazil. [Not examined]. Syn.n.

Simulium rorotaense is a widespread anthropophilic species from the Amazon and Orinoco basins and the Guianas. It is described in both adult and pupal stages by Floch & Abonnenc (1946b). The authors refer to two "types" which they number 751 and 752, being respectively, a female and pupal pelt and a male and pupal pelt mounted on slides. These have the status of syntypes, as do the six pupae numbered in the paper as 698, 699, 704, 705A, 705B and 716. No subsequent descriptions of *S. rorotaense* have been made but Floch & Abonnenc described a closely related species, *S. maroniense*, in the same

paper. Again they refer to two "types", a male and pupal pelt and a female and pupal pelt, mounted on slides and numbered 708 and 709 respectively. These are syntypes, as are the other nine pupae numbered 680B, 681, 682, 706, 706bis, 707, 707A, 707B, 710. They distinguished *S. maroniense* from *S. rorotaense* on the form of the pigmentation of the female paraprocts and gonapophysis, cibarium and gill, platelet density and trichome branching of the pupa.

We have examined two syntypes of *S. rorotaense* (751 and 752) and two of *S. maroniense* (708 and 709) from the Pasteur Institute, Paris; we presume that the other syntypes are in the Pasteur Institute, French Guiana. We designate the female and its pupal pelt on slide 751 as the lectotype of *S. rorotaense* since slide 752 of the male lacks the pupal pelt referred to in Floch & Abonnenc's paper (1946b). We designate the female on slide 709 as the lectotype of *S. maroniense* despite the lack of the pupal pelt referred to in Floch & Abonnenc's description (1946b). Similarly the material on slide 708 does not entirely correspond with that stated in this paper; a male paralectotype is present but with only the abdomen of its pupal pelt. Based on the examination of these types and the descriptions by Floch & Abonnenc (1946b) we regard *S. maroniense* as a synonym of *S. rorotaense* for the following reasons: the differences in the form of the paraprocts and gonapophyses noted by these authors are artefactual and caused by the abdomen of *S. rorotaense* being tilted slightly on the slide; no differences in pigmentation were observed. The cibariums of the two species are identical and the differences in pigmentation, platelet size and density, trichome branching and gill branch heights of the pupae are small and considered as intraspecific variations.

We also regard *S. wuayaraka* as a synonym of *S. rorotaense*. The female from Venezuela was described by Ortiz (1957), who cited the yellow colour of the first two abdominal tergites as the distinguishing character between this species and *S. rorotaense* and *S. maroniense* (in which these segments are dark brown according to Floch & Abonnenc (1946b)). In reared specimens of *S. rorotaense* from Brazil we found that these tergites ranged from dirty yellow to light brown.

Simulium fulvinotum from Brazil, described by Cerqueira & Nunes de Mello in Cerqueira (1967) and later, more fully with type designations in Cerqueira & Nunes de Mello (1968), is synonymised with *S. rorotaense* by Py-Daniel (1982). The designation of a "holotype" in the third paper in their series the "Simuliidae da Amazônia" (Cerqueira & Nunes de Mello, 1968) is incorrect and should have been of a lectotype since the earlier, second paper in the series (Cerqueira, 1967) conferred the status of syntypes to the type-material as no type designation had been made. Cerqueira & Nunes de Mello (1968) distinguish *S. rorotaense* from *S. fulvinotum* by the smaller size of the former (2.55mm compared to 3mm), the colour of the first three abdominal segments of the female, the form of the tooth on the female claw and on pupal gill form. Py-Daniel (1982) gives no reasons for his synonymy of *S. fulvinotum* with *S. rorotaense*. We cannot support their new taxon as no account has been taken of artefacts caused by orientation of the specimen, nor of intraspecific variation.

Simulium ignacioi, here synonymised with *S. rorotaense*, was described by Ramírez-Pérez & Vulcano (1973) from syntypes incorrectly referred to as "Una hembra y un macho holotipos . . . . .y ocho pupas . . . . ." [a female and a male holotypes and eight pupae]. These authors distinguished *S. ignacioi* from *S. wuayaraka* solely on the character that *S. ignacioi* has 17-20 gill filaments in the pupa; this is a puzzling statement since at that time the pupa of *S. wuayaraka* was unknown. *Simulium wuayaraka* was, however, later described by Ramírez-Pérez, Yarzábal & Peterson (1982) as having a pupal gill with 20 filaments, just as in *S. ignacioi*. Despite giving descriptions of both *S. ignacioi* and *S. wuayaraka* in the text, these authors make no comparison of these species; they place *S. ignacioi* in the subgenus *Psilopelmia* but do not refer to the subgeneric position of *S. wuayaraka*. Some confusion exists in their paper over the differences between these two species. The descriptions of both *S. ignacioi* and *S. wuayaraka* show no differences in the male scutum, whereas a figure of the male scutum of *S. ignacioi* clearly shows the

presence of submedian light bands on the anterior and posterior scutal margins; the male scutum of *S. wuayaraka* is not figured. Though not referred to in the description, this supposed distinction is contradicted by the key which refers to the absence of scutal bands in both species. Specimens of *S. rorotaense*, *S. ignacioi* and *S. wuayaraka* (the last two species determined by Ramírez-Pérez) in the BMNH collection all show to a varying degree the submedian banding figured in the male *ignacioi*; the ease with which this character is seen depends on the degree of translucency and/or greasing of the specimen. Other differences between *S. ignacioi* and *S. wuayaraka* shown in the keys are in the coloration of the legs of adults (except that descriptions in the keys do not always coincide with those in the text) and the coloration of the pupa and length of pupal filaments. In adults of these two species determined by Ramírez-Pérez we were unable to see differences in leg coloration and the pupal pelts associated with these specimens were concolorous. We presume that these authors were comparing teneral adults with mature adults and young pupae with older, more mature pupae. The differences in gill filament length cited by Ramírez-Pérez, Yarzábal & Peterson (1982) were not seen in the BMNH specimens but fall within the range of intraspecific variation.

Simulium rorotaense is closely related to *S. panamense* Fairchild which can only be distinguished by the presence of 1+1 submedian white vittae on the female scutum, and *S. suarezi* Ramírez-Pérez, Rassi & Ramírez, which may be separated on pupal gill form. Ramírez-Pérez, Yarzábal & Peterson (1982) distinguish *S. suarezi* from *S. rorotaense* (as *S. wuayaraka* and *S. ignacioi*) in their keys by the presence in *S. suarezi* of an orange area in the postero-superior pleural region in adults and on leg coloration. We did not observe these differences in our specimens.

Full descriptions of adults, pupae and larvae of *S. rorotaense* are given by Cerqueira & Nunes de Mello (1968, as *S. fulvinotum*) and of adults and pupa by Ramírez-Pérez, Yarzábal & Peterson (1982, as *S. ignacioi* and *S. wuayaraka*).

Simulium samboni Jennings

Simulium samboni Jennings, 1915: 199. Holotype ♀ and associated pupal pelt, PANAMA: Empire, R. Comancho. In USNM. [Examined].

Simulium colvini Dalmat, 1952: 343. Holotype ♂ and associated pupal pelt, GUATEMALA: Departament of San Marcos, stream between Malacatan and Ayutla. In USNM. [Synonymised by Vargas & Dias Nájera (1954).] [Not examined].

Simulium santaelenae Ramírez-Pérez & Peterson, 1981: 161. Holotype ♀ and associated pupal pelt, VENEZUELA: Bolivar State, Roscio District, Santa Elena de Uairen. In IND. [Not examined]. Syn.n.

This is a widespread zoophilic species common from Central America southwards to the Amazon basin of northern Brazil. The female and male were described by Jennings from Panama in 1915.

In 1952 Dalmat described the new species *S. colvini* from Guatemala and likened it to *S. downsi* and *S. samboni*. According to this author, characters for distinguishing the three species could be found in the female and male genitalia and in the pupal gill. *S. colvini* was synonymised with *S. samboni* by Vargas & Díaz Nájera in 1954. Although we have not examined the type-series of *S. colvini*, we agree with the reasons given by Vargas & Díaz Nájera for their synonymy.

The new species *S. santaelenae* described by Ramírez-Pérez & Peterson (1981) is also likened by its authors to *S. samboni*. They claim that the two species may be distinguished because the submedian vittae in the female scutum of *S. samboni* do not reach the silver-white posterior scutal margin whereas they do in *S. santaelenae* and that only simple trichomes are present in *S. santaelenae* pupae whereas they are bifid in *S. samboni*. We have compared the holotype of *S. samboni* with reared material collected

in Brazil 20km south of Santa Elena, Venezuela which is judged by us as conspecific with *S. santaelenae* of Ramírez-Pérez & Peterson. We regard the latter species as a synonym because the submedian white vittae on the scutum of the female holotype of *S. samboni* do reach the silvery white pruinosity of the posterior scutal margin, and trichome branching varies intraspecifically.

A full description of the adults, pupa and larva of *S. samboni* are given by Dalmat (1955, as *S. colvini*, not *S. samboni*) and of the adults and pupa by Ramírez-Pérez & Peterson (1981, as *S. santaelenae*).

A summary of the fifteen new specific synonyms created in this paper is as follows:

1. *S. cauchense* Floch & Abonnenc, 1946
   S. rangeli Ramírez-Pérez, Rassi & Ramírez, 1977. Syn.n.
   S. sextobecium Nunes de Mello, 1974. Syn.n.

2. *S. distinctum* Lutz, 1910
   S. prumirimense Coscarón. 1981. Syn.n.

3. *S. goeldii* Cerqueira & Nunes de Mello, 1967
   S. scorzai Ramírez-Pérez, 1980. Syn.n.

4. *S. limbatum* Knab, 1915
   S. machadoallisoni Vulcano, 1981. Syn.n.
   S. meruoca Nunes de Mello, Almeida & Dellome Filho, 1973. Syn.n.

5. *S. nigrimanum* Macquart, 1838
   S. pruinosum Lutz, 1910. Syn.n.

6. *S. oyapockense* Floch & Abonnenc, 1946
   S. pseudosanguineum Ramírez-Pérez & Peterson, 1981. Syn.n.
   S. sanchezi Ramírez-Pérez, Yarzábal & Peterson, 1982. Syn.n.

7. *S. quadrifidum* Lutz, 1917
   S. rassii Ramírez-Pérez, 1980. Syn.n.
   S. torrealbai Ramírez-Pérez, 1980. Syn.n.

8. *S. rorotaense* Floch & Abonnenc, 1946
   S. ignacioi Ramírez-Pérez & Vulcano, 1973. Syn.n.
   S. maroniense Floch & Abonnenc, 1946. Syn.n.
   S. wuayaraka Ortiz, 1957. Syn.n.

9. *S. samboni* Jennings, 1915
   S. santaelenae Ramírez-Pérez & Peterson, 1981. Syn.n.

The six lectotypes designated are for the following species: *S. cauchense*, *S. nigrimanum*, *S. oyapockense*, *S. quadrifidum*, *S. rorotaense*, *S. maroniense* (= *S. rorotaense*).

RESUMO

Procurando esclarecer a taxonomia dos Simuliidae Neotropicais, o que antecede a confecção de chaves para as espécies, vários problemas nomenclaturais são resolvidos. São dadas informações sobre os tipos, onde estão depositados, suas condições, quando importante, e sinonímias. Quinze novos sinônimos são criados e seis lectotipos designados com base no exame de material tipo e de uma grande série de espécimes criados de muitas localidades, para se verificar as variações intraespecíficas.

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Addendum

While this manuscript was in press two papers concerning nomenclature of Neotropical simuliids have been published which affect the priority of the new synonyms given above.

Initially we presented our synonymies in an informal workshop on the taxonomy of neotropical simuliids in 1982 with the intention of formally ratifying them in this paper. However, according to the Code of Zoological Nomenclature the following two papers should be cited as the original source for these synonymies:

World Health Organization (1982). Report of an informal workshop on the taxonomy of South American Simuliidae of Medical Importance. TDR/FIL/SIM/82.3. 13pp. (Mimeographed document).

Simulium cauchense Floch & Abonnenc, 1946
Simulium sextobecium Nunes de Mello, 1974. Syn.n.
Simulium rangeli Ramírez-Pérez, Rassi & Ramírez, 1977. Syn.n.

Simulium limbatum Knab, 1915
Simulium meruoca Nunes de Mello, 1974. Syn.n.
Simulium machadoallisoni Vulcano, 1981, replacement name for *S. machadoi* Ramírez-Pérez, 1981, preoccupied *S. machadoi* Luna de Carvalho, 1962, Syn.n.

Ramírez-Pérez, J. (1983). Los jejenes de Venezuela.
Caicet, Puerto Ayacucho, Venezuela. 156pp.
Simulium rorotaense Floch & Abonnenc, 1946
Simulium ignacioi Ramírez-Pérez & Vulcano, 1973. Syn.n.

Simulium oyapockense Floch & Abonnenc, 1946
Simulium pseudosanguineum Ramírez-Pérez & Peterson, 1981. Syn.n.

Simulium goeldii Cerqueira & Nunes de Mello, 1967
Simulium scorzai Ramírez-Pérez, 1980. Syn.n.

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POHL, I. [= J.] E. & KOLLAR, V., 1832. *Brasiliens vorzüglich lästigen Insecten*. 20pp. Wien. [This work contains the description of *Simulium pertinax* by Kollar on p.19. It is extracted and repaginated from pp. 101-119 in Pohl, 1832. It differs from the original in attributing co-authorship to Kollar on the title page and in the differently set legend (p.20) to the plate.]

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